NOFER INSTITUTE OF OCCUPATIONAL MEDICINE

Polskie Towarzystwo Medycyny Pracy

FIFTH INTERNATIONAL CONFERENCE ON WORK ENVIRONMENT AND CARDIOVASCULAR DISEASES

27–30 SEPTEMBER, KRAKÓW, POLAND

Under the auspices of Ministry of Science and Higher Education, and:

Rector of the Jagiellonian University, Prof. Karol Musioł D.Sc.

World Health Organization

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EDITORIAL

Dear Colleagues, Dear Friends

The Scientific and the Organizing Committees of the Fifth Conference on Work Environment and Cardiovascular Diseases take great pleasure in welcoming all the participants and guests at this prestigious event in Kraków, Poland. We are proud that the Scientific Committee of Cardiology in Occupational Medicine, one of the sub-commissions of the International Commission on Occupational Health (ICOH), has entrusted the Nofer nstitute of Occupational Medicine, Poland, with the task of organizing this Conference. We did our best to ensure that it will have the highest scientific and organizational standards. The Conference has been organized under the auspices of the World Health Organization (WHO), the Polish Ministry of Science and Higher Education, the Chancellor of the Jagiellonian University, the Polish Society of Occupational Medicine, the International Society for Holter and Noninvasive Electrocardiology, and the Polish Cardiac Society, Noninvasive Electrocardiology and Telemedicine Section (SENIT).

The main topic of the Conference, which is research and prevention in the field of cardiovascular diseases (CVDs), is of particular relevance for scientists in the 21st century as CVDs constitute a major health problem worldwide. The well-recognized cardiovascular risk factors, such as high cholesterol level, diabetes, hypertension, obesity, physical inactivity, unhealthy diet, genetic predisposition and active or passive tobacco smoking account for only about 50% of the cases of cardiovascular diseases. There are a number of other factors, including the psychological, social and occupational ones, which may be associated with the initiation of CVDs. Moreover, new problems have also emerged in connection with the changing nature and organization of work due to economic globalization and technological advancement.

We expect that the Conference will be an excellent opportunity for specialists in cardiology, occupational medicine, cardiac rehabilitation, sociology, and psychology and for policy makers in occupational health to develop interdisciplinary collaboration in order to reduce the adverse effects and enhance the protective function of work as well as strengthen the activities for workplace health promotion.

We hope that, apart from taking advantage of the scientific content of the conference, you will also enjoy sightseeing in Kraków, which is a beautiful and historic city, the ancient capital of Poland. Kraków is also an important educational and cultural centre, the seat of the Jagiellonian University, the oldest university in Poland which was founded in 1397. Owing to its ancient monuments and world-famous sights, Kraków was included in 1978 in the UNESCO World Heritage List. The splendid historic evidence and the unique atmosphere of the Old Town make Kraków a must-see destination for every foreign visitor.

We do hope that your visit to Poland and attendance at the Conference will be a memorable and interesting experience.

On behalf of the Organizers

Chairman of Organizing Committee

Assoc. Prof. Alicja Bortkiewicz, Ph.D.
Head of Department of Work Physiology and Ergonomics, Nofer Institute of Occupational Medicine

President of Scientific Committee

Prof Konrad Rydzyński, M.D., Ph.D.
Director General, Nofer Institute of Occupational Medicine (NIOM)

JOB STRESS, CHRONIC DISEASE, AND HEART RATE VARIABILITY

SEPTEMBER 27, 2009, KRAKÓW, POLAND
FIFTH INTERNATIONAL CONFERENCE ON WORK ENVIRONMENT AND CARDIOVASCULAR DISEASE

PRE-CONFERENCE WORKSHOP

Dear Colleagues,

We have the pleasure to announce a pre-conference Workshop on **Heart Rate Variability and Job Stress Analysis: Discussing a New Platform for Large-scale Work/CVD Studies** September 27, 2009, in Kraków, Poland, Fifth International Conference on Work Environment and Cardiovascular Disease organized by prof. Robert Karasek and Els Clays.

This is a very good opportunity to meet famous specialists in that field and to get acquainted with the new trends in heart rate variability analysis. Please take a look at the programme of the workshop.

Programme

Heart Rate Variability and Job Stress Analysis: Discussing a New Platform for Large-scale Work/CVD Studies	
9.00–9.10	Welcome from Robert Karasek and Els Clays, Workshop co-chairs
9.10–9.40	*Dual Goals of the Workshop: (A) New Tools (B) New Work/CVD studies* Dual goals of the workshop: Based on use of (a) new tools for using HRV in occupational stress context and new theory, we hope to build a new platform for the (b) design of large-scale new Work/CVD studies — to be discussed in workshop Karasek R.
9.40–10.10	*Physiological / Clinical interpretation of heart rate variability (HRV).* Including time and frequency domain concepts (TBA/Collins S. — by Camtasia)
10.10–10.30	Coffee break
10.30–11.00	*HRV and Job Stress: A Review of Literature* Clays E.
11.00–12.00	*High Level Theory of Disease: Stress-Disequilibrium (S-D) Theory, physiological implications for exhaustion and multi-level testing of stress/disease linkages* A regulatory effectiveness spectrum; Creating and using up control capacity, Variability and work of adaptation in S-D theory and Allostasis; Multi-level testing of Work/Disease pathway via S-D Theory Karasek R.
12.00–13.00	Lunch break
13.00–13.30	*Getting and Testing the Data: Collection and first pass processing for: (a) job strain, and (b) multi-level S-D testing* Standardization of stressor exposure; temporal aggregates and nested hierarchies Collins S. — by Camtasia
13.30–14.00	*HRV in Work Environment Context: Defining Exhaustion in S-D Theory* Exhaustion, Periodicity, Controller/Controlled relations, multiple contrasts between high and low strain work, work vs. sleep, etc.; Sociological Periods Karasek R.
14.00–14.20	*Measuring Exhaustion Response* Collins S. — by Camtasia
14.20–14.40	Coffee break
14.40–15.10	*Complexity of modeling contrasts: allocating the variance* Multi-scale modeling with HRV (and multi-level measures) and sociological periods, & Within-subject vs. between subject comparisons Collins S. — by Camtasia
15.10–15.40	*Discussion of HRV analytic tools in occupational stress contexts* Karasek R., Clays E.
15.40–15.50	*Planning Large-scale HRV-based Work/CVD studies* Ferrario M.
15.50–17.00	*General Discussion of Large Scale Work/CVD Study Planning* Ferrario M., Clays E.
17.00	Adjourn

FIFTH INTERNATIONAL CONFERENCE ON WORK ENVIRONMENT AND CARDIOVASCULAR DISEASES

27–30 SEPTEMBER, KRAKÓW, POLAND

PROGRAMME

SEPTEMBER 28, 2009 (MONDAY)

Plenary session
Chairpersons: Rydzyński K., Schnall P.

9.00–9.30	*Opening ceremony* Polish Ministry of Science, ZUS, Rector of Jagiellonian University, Director of Nofer Institute of Occupational Health, World Health Organizations (WHO) International Society of Holter and Noninvasive Electrocardiology (ISHNE)
9.30–10.00	*Human Capital Operational Programme in Poland — the role in supporting employees' health* Rydzyński K., Walusiak-Skorupa J.
10.00–10.30	*Why cardiovascular diseases and work* Schnall P.
10.30–11.00	*The pathways between job stress and cardiovascular illness development.* *A comparison of the allostasis and the stress-disequilibrium theory approaches* Karasek R.
11.00–11.20	Coffee break

Session I (pararell with session II)
OCCUPATIONAL AND ENVIRONMENTAL FACTORS AND CARDIVASCULAR DISEASES — MECHANISM AND METHODS OF EVALUATION
Chairpersons: Baranowski R., Karasek R.

11.20–11.40	*Usefulness of long-term electrocardiological methods in occupational medicine* Baranowski R.
11.40–12.00	*Multiscale modelling of heart rate variability in high strain job and exhausted subjects* Collins S., Karasek R.
12.00–12.15	*Reproducibility and seasonal variation of ambulatory short-term heart rate variability in healthy subjects during a self-selected rest period and during sleep* Kristiansen J., Olsen A., Skotte J.H., Garde A.
12.15–12.30	*Adrenaline vs. noradrenaline response to acute stress in conscious rabbits* Roatta S., Mazher M., Passatore M.
12.30–12.45	*Type of sympato-adrenal system of bus drivers reaction to psycho-emotional stress* Nikolaev V.I., Homulo D.P., Belogurova E.A., Budnikova I.V.
12.45–13.00	*Job strain as a determinant of heart rate variability among resident doctors in a General Hospital in Mexico City* Hernandez-Gaytan S.I., Rothenberg S.J., Díaz–Vásquez F.J., de León León G., Cedillo Becerril L.A., Landsbergis P., Collins S.M.
13.00–14.00	Lunch. Poster session

Session II (pararell with session I)
BLOOD PRESSURE AND WORK
Chairpersons: Kristensen T., Wranicz K.

11.20–11.40	*Work stress and blood pressure in Chinese University Staff* Li J., Fan L., Shang L., Zhou M., Gu H., Siegrist J.
11.40–12.00	*Vascular health is correlated to the number of risk factors among finnish aging industrial workers* Lindholm H., Ruuskanen J., Hämäläinen H., Sistonen H., Kallio L., Konttinen J., Rautio M., Kemppainen T.
12.00–12.20	*Blood pressure monitoring and psychosocial risk factors in call center work* Maina G., Bovenzi M., Palmas A., Prodi A., Larese Filon F.
12.20–12.40	*Job strain and work-family spillover are risk factors for hypertension* Yang H., Hammer L., Choi B., Nakata A., Schnall P., Baker D.
12.40–13.00	*The association between job strain and blood pressure variability in middle-aged men and women* Clays E., De Bacquer D., De Buyzere M., Kornitzer M., Kittel F., De Backer G.
13.00–14.00	Lunch. Poster session

Session III (pararell with session IV)
CVD IN COUNTRIES IN TRANSITION
Chairpersons: Landsbergis P., Pikhart H.

14.00–14.30	*New research directions in chronic disease prevention in the workplace* Landsbergis P., Schnall P.
14.30–15.00	*The current trends in CVD in countries undergoing economic transition in Central and Eastern Europe* Pikhart H.
15.00–15.20	*Perceptions of psychosocial hazards and work-related stress and their health impact across various developing countries* Kortum E., Leka S., Cox T.
15.20–15.40	*A WHO perspective and the WHO Global Plan of Action on Workers' Health* Kortum E.
15.40–16.00	Coffee break. Poster session

Session IV (pararell with session III)
WOMEN AND CVD
Chairpersons: Cedillo Becerril L.A., Makowiec-Dąbrowska T.

14.00–14.30	*Women workers. Thinking about the gender differences on psychosocial exposures and CV outcomes* Cedillo Becerril L.A., Hernandez-Gaytan S.
14.30–15.00	*Work stress as risk factor of cardiovascular disease in women* Makowiec-Dąbrowska T.

15.00–15.15	*Psychosocial work stress and hypertension in pregnancy* Neto J.M., Fonseca I., Marques S., Queroz M.S., Moura S., Oliveira N., Araújo T.
15.15–15.30	*Housework and hypertension during pregnancy* Neto J.M., Fonseca I., Marques S., Moura S., Oliveira N., Araújo T.
15.40–16.00	Coffee break. Poster session
Session V **CARDIOLOGICAL PROBLEMS OF THE NIGHT AND SHIFTWORK** Chairpersons: Costa G., Pokorski J.	
16.00–16.30	*Night and shift work and cardiovascular problems* Costa G., Härmä M., Pokorski J.
16.30–16.45	*Cardiovascular problems in shift- and day-working nurses participating in the EU NEXT-study* Pokorski J., Hasselhorn H.-M., Pokorska J., Nitecka E.
16.45–17.00	*Blood circulation regulation in human-operator under shift work* Bobko N.
17.00–17.15	*Shift work and metabolic syndrome, diabetes mellitus and ischaemic heart disease* Szosland D.
17.15–17.30	*Infradian and ultradian variations in the carotid body* Pokorski M.
19.30	Get together party
SEPTEMBER 29, 2009 (TUESDAY)	
Plenary Session (simultaneous translation for polish participants) Chairpersons: Siegrist J., Ferrario M.	
8.30–9.00	*Effort-reward imbalance and cardiovascular diseases* Siegrist J.
9.00–9.30	*Improving the psychosocial work environment in practice. Real life challenges and opportunities* Kristensen T.S.
9.30–10.00	*Telemedicine — new way in cardiac rehabilitation* Piotrowicz R.
10.00–10.45	*A role of occupational medicine doctor in a cardiovascular risk reduction through performance of the Pfizer's "Smoke Free Workplace" antinicotine program* Malicka M.
11.15–11.30	Coffee break. Poster session

Session VI (pararell with session VII)
PHYSICAL FACTORS AND CARDIOVASCULAR DISEASES
Chairpersons: Oftedal G., Bortkiewicz A.

11.30–12.00	*May nervous system dysfunctions and psychogenic causes explain idiopathic environmental intolerance attributed to electromagnetic fields? A literature review* Oftedal G.
12.00–12.15	*Health risk assessment in occupational EMF exposure* Dăbală D.C., Surcel D., Szanto C.
12.15–12.30	*Electrocardiogram changes in hot line workers exposed to electromagnetic fields* Pruktharathikul V., Siriyanun S., Pulket C., Arphorn S., Rojanavipart P.
12.30–12.45	*Prediction and prevention of physiological risk factors during intensive exercise in a hot environment* Yermakova I., Bogatenkova A., Nikolaienko N., Zilberter T.
12.45–13.00	*Cardiovascular manifestation among workers in meat production exposed to cold environment* El Safty A., Nabil A.M., Hossam K., Shireen A.
13.15–13.30	*Is working in normobaric hypoxia a risk factor for cardiac disease? A one year cohort study* Angerer P., Englmann I., Petru R., Marten-Mittag B.
13.30-14.30	Lunch. Poster session

Session VII (pararell with session VI)
INTERVENTIONS ACTIVITIES IN DIFFERENT WORKPLACES
Chairpersons: Tsutsumi A., Lyskov E.

11.30–11.45	*Stress management interventions in the workplace improve perceived stress reactivity: a randomized, controlled trial* Angerer P., Limm H., Gündel H., Heinmüller M., Marten-Mittag B., Nater U.M.
11.45–12.00	*Efficacy of the smoking cessation therapy in working places within the "smoke free workplace" program — a multicenter pilot study* Jurgilewicz A., Zagórski G., Malicka M., Porębska I.
12.00–12.15	*Cognitive-behavioral psychotherapy in the system of ischeamic heart disease treatment* Solovjova S.L., Oderysheva E.B., Demchenko E.A., Velicanov A.A.
12.15–12.30	*Prevention of psycho-emotional stress for prophylactics of cardiovascular diseases among bus drivers* Artamonova V.G., Lashina E.L., Shvalev O.
12.30–12.45	*Structured coping skills training can reduce stress-related symptoms, but not work stress* Stauder A., Williams V., Williams R.
12.45–13.00	*Systemic and local responses to stress in subjects with chronic muscle pain and healthy controls* Hallman D., Lindberg L.G., Lyskov E.
13.30–14.30	Lunch. Poster session

Session VIII
JOB STRESS AND CARDIOVASCULAR DISEASE IN THE CHANGING LABOR MARKET IN EUROPE AND ASIA: ICOH SCS CVD AND WOPS JOINT SYMPOSIUM
Chair: Kawakami N., Co-chair Tsutsumi A.

14.30–15.00	*Job demands and risks of CHD and stroke among Japanese men: Prospective findings from the JSTRESS study* Kawakami N., Tsutsumi A., Haratani T., Kobayashi F., Ishizaki M., Hayashi T., Fujita O., Aizawa Y., Miyazaki S., Hiro H., Masumoto T., Hashimoto S., Araki S.
15.00–15.30	*Impact of occupational stress on stroke incidence and its possible mediating factors among Japanese workers* Tsutsumi A.
15.30–16.00	*A prospective study of work stress and cardiovascular diseases in Chinese female nurses* Li J., Shang L., Hasselhorn H., Siegrist J.
16.00–16.30	*Why does the Job strain model not work as an exposure measure in relation to the risk of development of ischemic heart disease?* Netterstrøm B.
16.30–17.00	Disscussion Discussant: Kristensen T.S.
18.30	Farewell Banquet

SEPTEMBER 30, 2009 (WEDNESDAY)

Plenary Session under the auspices of ISHNE
Chairpersons: Zaręba W., Piotrowicz R.

9.00–9.30	*Socio-occupational class and cardiovascular diseases* Ferrario M.M.
9.30–10.00	*Work related psychosocial factors and the development of Ischemic Heart Disease* Eller N.
10.00–10.30	*Fine particulate dust and cardiovascular diseases* Zaręba W.
10.30–10.50	Coffee break. Poster session

Session IX
JOB STRAIN AND CARDIOVASCULAR DISEASES — THE EPIDEMIOLOGICAL STUDIES
Chairpersons: Hanke W., Netterstrøm B.

10.50–11.10	*Job insecurity — an emerging risk factor for heart disease in Denmark?* Netterstrøm B., Kristensen T.S.
11.10–11.30	*An Aging population. The part job strain plays on the prevalence of hypertension, total cholesterol and waist to height measurements in a cohort of the Irish general population* Mc Carthy V., Perry I.J., Greiner B.A.

11.30–11.50	*Income differences in stroke mortality: a follow-up study of the Swedish working population* Toivanen S.
11.50–12.10	*The distribution of effort-reward imbalance in a representative sample of the Danish workforce* Rugulies R., Aust B., Siegrist J., Von dem Knesebeck O., Bültmann U., Bjorner J.B., Burr H.
12.10–12.30	*Associations of occupation, job strain and subclinical cardiovascular diseases in the Multi-Ethnic Study of Atherosclerosis (MESA)* Fujishiro K., Roux A.D., Landsbergis P., Baron S., Hinckley Stukovsky K., Barr R.G., Polak J.F., Shrager S., Kaufman J.D.
12.30–13.30	Lunch, poster session

Session X

WORK ENVIRONMENT AND CARDIOVASCULAR DISEASES — THE EPIDEMIOLOGICAL STUDIES

Chairperson: Schnall P., Van Amelsvoort L.

13.30–13.50	*Examining changes in the determinants of job satisfaction in Canada between 1994 and 2005* Smith P.
13.50–14.10	*Changes in body mass index in shift and daytime workers over time, preliminary results from the 10 years follow up of the Maastricht cohort study* Van Amelsvoort L., Jansen N., Mohren D., Janssen N., Kant I.
14.10–14.30	*Does leisure time physical activity increase the risk of ischemic heart disease mortality among men with high physical work demands? A 30 year follow-up in The Copenhagen Male Study* Holtermann A., Mortensen O., Burr H., Søgaard K., Gyntelberg F., Suadicani P.
14.30–14.50	*Does high physical fitness protect workers with high physical demands from cardiovascular mortality? A 30 year follow-up in The Copenhagen Male Study* Holtermann A., Mortensen O.S., Burr H., Søgaard K., Gyntelberg F., Suadicani P.
14.50–15.10	*Longer work weeks predict shorter lives: results from a 17-year prospective study of work time and mortality among middle-aged Finnish men* Krause N., Brand R., Kauhanen J.
15.10–15.30	*A survey of psychosocial work environment and job burnout in Chinese enterprise employees* Zhou M., Li J., Zhang H., Qiu K., Yang J.
15.30–15.50	*Time-related aspects of the healthy worker survivor effect* Nuru K.
15.50-16.00	*Work stress and overeating coping in the US workforce* Choi B., Schnall P., Yang H., Dobson M., Landsbergis P., Israel L., Karasek R., Baker D.
16.00-16.10	*Sedentary work. Low physical job demands and obesity in US workers* Choi B., Schnall P., Yang H., Dobson M., Landsbergis P., Israel L., Karasek R., Baker D.
16.10-16.20	*Psychosocial job charakteristics and active leisure – time physical activity in the US workforce* Choi B., Schnall P., Yang H., Dobson M., Landsbergis P., Israel L., Karasek R., Baker D.
16.30	Closing remarks

POSTER SESSION

1. *Evaluation of the cardiovascular workload of loading machine operators during forestry work in Turkey*
   Tunay M., Melemez K.

2. *Stress-test for early diagnostics of the myocardium dysfunction*
   Makhnov A.P.

3. *Work-family related risk factors for major depression*
   Yang H., Nakata A., Choi B., Hammer L., Schnall P., Baker D.

4. *The association of metal working fluid mist exposure on respiratory function in automotive part workers*
   Chaikittiporn C., Pateang S., Pulket C., Arphorn S., Singhakajen V., Loosereewanich P.

5. *Studying the association between psychosocial work characteristics and cardiovascular morbidity, a methodological challenge*
   Szerencsi K., Van Amelsvoort L., Kant I.

6. *Attenuated vascular endothelial function assessed by pat score is associated with cardiovascular risk factors in middle-aged municipal workers*
   Konttinen J., Lindholm H., Sinisalo J., Kuosma E., Hopsu L., Uitti J., Leino T.

7. *Cardio-vascular adaptation to heavy load in an annual cycle training of cyclists*
   Poliszczuk D., Mazurek K., Polishchuk T.

8. *The heart rate and blood pressure variations due to metalworking fluids exposure in an automobile manufacturing plant*
   Mokhtari A., Golbabaei F, Jalili A., Kasaiean A.

9. *Cardiocirculatory and Thermal Strain of Male Firefighters during Fire Suppression to Exercise Stress Test and Aerobic Exercise Testing*
   Angerer P., Kadlez-Gebhardt S., Delius M., Petru R., Nowak D.

10. *Differences in myocardial infarction frequency in relation to place of habitation within the Łódź Province*
    Viebig P., Szyjkowska A., Gadzicka E., Siedlecka J., Lewicka M., Makowiec-Dąbrowska T., Bortkiewicz A.

11. *Occupational stress in people with myocardial infarction*
    Szyjkowska A., Viebig P., Gadzicka E., Siedlecka J., Lewicka M., Makowiec-Dąbrowska T., Bortkiewicz A.

12. *Stressful situations and blood pressure in public transport drivers*
    Siedlecka J., Bortkiewicz A., Gadzicka E.

13. *Occupational and environmental factors and myocardial infarction — an epidemiological studies in the region of Łódź, Poland*
    Bortkiewicz A., Gadzicka E., Siedlecka J., Szyjkowska A., Viebig P., Lewicka M., Makowiec-Dąbrowska T.

14. *Neurovegetative disturbances in workers exposed to electromagnetic fields*
    Bortkiewicz A., Gadzicka E., Zmyślony M., Szymczak W.

15. *Ambulatory versus occassional blood pressure measurements in workers exposed to electromagnetic fields*
    Gadzicka E., Bortkiewicz A., Zmyślony M., Szymczak W.

16.	*Return to work after myocardial infarction* Waszkowska M.
17.	*System for diagnostics of atrial arrhythmias* Ivanushkina N., Yermakova I., Fesechko V., Ivan'ko K.
18.	*Evaluation of the nutrition levels among the students of the Main School of Fire Service (SGSP)* Szymańska W., Walecka I., Bertrandt J.
19.	*Circadian changes in ECG in air traffic controllers (atc)* Zużewicz K, Korczak D., Bugajska J., Konarska M.
20.	*ECG, physical fitness and some cardiovascular problems in shift- and day-working female crane operators* Pokorski J.

JOB STRESS AND CARDIOVASCULAR DISEASE IN THE CHANGING LABOR MARKET IN EUROPE AND ASIA: ICOH SCS CVD AND WOPS JOINT SYMPOSIUM

CHAIR: Norito Kawakami

Chair of Icoh Sc Wops
University of Tokyo, Tokyo, Japan
Department of Mental Health

COCHAIR: Akizumi Tsutsumi

Vice Chair of Icoh Sc Cvd
University of Occupational and Environmental Health, Kitakyushu-city, Japan

SCOPE OF THE SYMPOSIUM

Job stress defined in the job strain model and effort/reward model (ERI) has been linked to coronary heart disease (CHD) and stroke in the US and Europe and recently among Asian countries. However, a recent review of job stress associated with CHD reported that recent studies tended to show the association of job demands, rather than job control, with CHD in Europe, possibly reflecting job control increasing among workers in Europe. On the other hand, among Asian countries, while job demands, rather than job control, were often associated with CHD, recent studies reported job control and ERI might have a stronger role in developing CHD. This symposium aims to clarify the cross-cultural picture of the impact of job stress on cardiovascular disease (CHD and stroke) in the changing world of work, based on recent prospective evidence from Asia and Europe.

TITLES OF PRESENTATION AND SPEAKERS

1. *Job demands and risks of CHD and stroke among Japanese men: Prospective findings from the JSTRESS study*
   Kawakami N., Department of Mental Health, University of Tokyo, Tokyo, Japan
2. *Impact of occupational stress on stroke incidence and its possible mediating factors among Japanese workers*
   Tsutsumi A., University of Occupational and Environmental Health, Kitakyushu-city, Japan
3. *A prospective study of work stress and cardiovascular diseases in Chinese female nurses*
   Li J., Department of Safety Engineering, University of Wuppertal, Wuppertal, Germany
4. *Why does the Job strain model not work as an exposure measure in relation to the risk of development of ischemic heart disease?*
   Netterstrøm B., Clinic of Occupational Medicine, Hillerød Hospital, Hillerød, Denmark

DISCUSSANT

Kristensen T.S., Task-Consult, Denmark

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JOB DEMANDS AND RISKS OF CHD AND STROKE AMONG JAPANESE MEN: PROSPECTIVE FINDINGS FROM THE JSTRESS STUDY

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Abstract

Objectives: The aim of the study is to clarify the prospective relationship between different job demands and risk of CHD and stroke among employed men in Japan. **Methods:** The Japan Work Stress and Health Cohort Study (JSTRESS) is a multi-site prospective cohort study in Japan. The baseline surveys were conducted in five companies between 1996 and 1998 and 25 104 questionnaires were returned (response rate, 85%). The following analysis was limited to 19 033 men. We further excluded those (n = 847) who had coronary heart disease or stroke at baseline and those who had a missing response to relevant variables. A total of remaining 14 716 men were followed up until March 2003. The follow-up period was 5.2 years on average. Several job demands were measured using the Job Content Questionnaire (JCQ) (psychological and physical job demands, as well as global competition items), the US NIOSH Generic Job Stress Questionnaire (GJSQ) (job overload and cognitive demands), as well as overtime. Incidence of CHD and stroke was monitored and reported by occupational physicians. **Results:** A total of 17 and 29 incident cases for CHD and stroke, respectively, during the follow-up. JCQ psychological job demands and physical job demands and GJSQ job overload were significantly associated with a greater risk of CHD after controlling for age, education, marital status, occupation, and hypertension at baseline. Lowered job control due to global competition was significantly associated with a greater risk of CHD. None of the job demands variables were significantly was associated with a risk of stroke. **Conclusion:** Quantitative job demands seem to be associated with increased risk of CHD, independent of overtime. Global competition may affect the incidence of CHD to some extent. Job demands are not a major factor for the incidence of stroke in this sample.

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A PROSPECTIVE STUDY OF WORK STRESS AND CARDIOVASCULAR DISEASES IN CHINESE FEMALE NURSES

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Abstract

Background: So far, the causal relationship between work stress and cardiovascular diseases (CVD) is not consistent, particularly in women; and little evidence has been reported from China, the biggest developing country. This study was to examine the association between work stress and self-reported CVD in a sample of Chinese female nurses. **Materials and Methods:** In this prospective study, a total of 3088 registered female nurses working in hospitals were recruited in baseline survey, 1697 nurses without CVD at baseline were followed-up for one year. The work stress was measured by Effort-Reward Imbalance questionnaire twice at baseline and at follow-up, and CVD (e.g. Hypertension, coronary heart disease) were self-reported with physician's diagnosis. **Results:** At baseline, 5.67% nurses had reported CVD, it was found that nurses with high work stress had high risk for CVD (OR = 2.16, 95% CI: 1.28–3.65). At follow-up, the incidence of CVD was 2.95%. Compared to the reference group (low work stress both times), nurses with high work stress at the first but with low work stress at the second assessment had nonsignificant higher risk for developing CVD (RR = 2.68, 95% CI: 0.78–9.24), those with high work stress at both baseline and follow-up showed a 5.76 fold higher risk (95% CI: 1.97–16.88), and those initially exposed to low work stress but exposed to high work stress one year later had highest risk (RR = 6.62, 95% CI: 2.15–20.34). **Conclusions:** Our results support previous findings of a causal relationship between work stress and CVD in women. The future intervention on psychosocial factors in workplace should be taken into account to decrease CVD incidence in China.

Key words:
Effort-Reward Imbalance, Cardiovascular Diseases, Female Nurses, China

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WHY DOES THE JOB STRAIN MODEL NOT WORK AS AN EXPOSURE MEASURE IN RELATION TO THE RISK OF DEVELOPMENT OF ISCHEMIC HEART DISEASE?

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Abstract

Studies based on populations working in the 1960ties to 1980ties in Western Europe showed some support for that job strain was a risk factor for contracting ischemic heart disease (IHD). The incidence of stroke in these countries among the working population was to small to make reliable studies of the association between stroke and psychosocial working factors. Recent studies have however not found associations between job strain and IHD. Only demands have in some studies showed the expected associations. Few studies have found associations between effort-reward--imbalanced, insecurity and injustice and IHD and there growing evidence for that low degree of social support increases the risk. The question now is if the psychosocial exposures at the labour market in Western Europe have changed so the job strain model does not capture the relevant work related factors contribution to increased risk. Other factors in non industrial settings might be of more importance. To discus this issue relevant studies will be highlighted.

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IMPACT OF OCCUPATIONAL STRESS ON STROKE INCIDENCE AND ITS POSSIBLE MEDIATING FACTORS AMONG JAPANESE WORKERS

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Abstract

Objectives: Evidence on the association between occupational stress and stroke incidence is limited. The aim of the study was to investigate the association and its possible mediating factors in a multicenter community-based prospective study of Japanese male and female workers. **Materials and Methods:** The baseline examination conducted from 1992 to 1995 determined the socioeconomic, behavioral and biological variables in addition to the occupational stress of 6553 community-dwelling workers aged 65 and under and free from history of cardiovascular diseases. Occupational stress was evaluated using a Japanese version of the demand-control questionnaire. Diagnosis of stroke was ascertained by an independent committee using accepted diagnostic criteria. **Results:** During a mean follow-up of 11 years, we identified a total of 147 incident strokes. Age and area-adjusted analysis revealed an increased risk of total stroke among men with job strain (combination of high job demand and low job control) compared with counterpart men with low strain (combination of low job demand and high job control) (hazard ratio, 2.62; 95% CI: 1.13–6.04). Although women with job strain tended to have a higher risk of stroke, the association was not statistically significant. The socioeconomic status (education and occupational category) was lower for men exposed to job strain. Men exposed to job strain were more likely to heavy drinkers and diagnosed hypertension. The hazard ratio for job strain on stroke incidence rather increased after socioeconomic status and behavioral risk factors were added to the multivariate model. But adjustment for hypertension attenuated the risk although still statistically significant. **Conclusions:** Job strain was associated with stroke incidence among Japanese men. The association may be mediated by the presence hypertension.

Key words:

Cardiovascular diseases, Hypertension, Socioeconomic status, Stress, Psychosocial, Work

The number and title of the project under which the study has been carried: The Jichi Medical School (JMS) Cohort study.

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ABSTRACTS

KEYNOTE LECTURES

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WORK RELATED PSYCHOSOCIAL FACTORS AND THE DEVELOPMENT OF ISCHEMIC HEART DISEASE

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Abstract

Atherosclerosis developed during years is the background for ischemic heart disease (IHD), which is one of the leading causes for morbidity and mortality all over the world. Risk factors for atherosclerosis and IHD are numerous, e.g. male gender, age, high blood pressure and cholesterol, diabetes, physical inactivity, and smoking, all well known risk factors shared for a number of life style diseases. Also, psychosocial factors may be involved in the pathophysiology of IHD as the social gradient of disease is generally very strong in connection with IHD compared to e.g. cancer. A recent review of the literature on the relationship between work-related psychosocial factors and the development of ischemic heart disease (IHD) (Card Rev 2009;17:83–97) revealed 33 articles meeting the inclusion criteria (prospective study or case control study with an objective measure of exposure; manifest IHD; exposure assessed as a work-related psychosocial factor). Only 8 articles presented risk estimates considering IHD in women, in contrast to 22 articles presenting risk estimates considering IHD in men. All together, the articles presented 51 analyses of studies involving male participants, 18 analyses involving female participants, and 8 analyses including both genders. Twenty of the studies originated in the Nordic countries, and the major dimensions of the Demand-Control Model were the focus of 23 articles. The review concluded that there is moderate evidence that high psychological demands, lack of social support, and isostrain are risk factors for IHD among men. Studies performed during recent years have not shown evidence for lack of control as a risk factor for IHD. Several studies have shown that job strain is a risk factor in men, but in the more recent ones, these associations can be fully explained by the association between demands and disease risk. There is only insufficient evidence considering other psychosocial factors in men and too few studies to draw any conclusion concerning women, work stress, and IHD. Methodologically key points are first of all that manifest IHD is preceded by a very long development of atherosclerosis and secondly the assessment of the exposure. The relevant exposure may differ between cultures. It is important to use standardised questionnaires but also to re-think exposure in the specific population under research. Age in it self is a strong risk factor for IHD. To prevent IHD by improvement of work environment studies must be carried through in populations preferable before middle age. During a long follow-up exposure (life style as well as working conditions) may change several times including changes in connection with retirement. Therefore a rather short follow-up is recommended. If the end point of the study is IHD this requires a large population and a lot of money. As changes in degree of atherosclerosis measured by the use of ultrasound examination of the carotic arteries are a short cut to evaluate effects of exposure as well as intervention this method is recommended in studies on effects of psychosocial work factors and IHD. Also studies on stress physiology (salivary cortisol, heart rate variability etc) and psychosocial factors may be recommended as the aim of research is to prevent disease rather than to count fatalities.

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SOCIO-OCCUPATIONAL CLASS AND CARDIOVASCULAR DISEASES

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Abstract

The decline in cardiovascular and coronary mortality documented in most western industrialized countries does not seem to be equally spread among socio-economic classes: less educated people and less qualified workers evidenced a smaller decline, starting generally some year later. An inverse association between socio-economic status (SES) and cardiovascular disease (CVD) death rates has been observed since the second half of the nineteenth century in the UK and then in most industrialized countries. Over time, the relative difference in coronary hearth disease (CHD) mortality among social classes persisted, despite the absolute gap is decreasing. Some studies, mainly European myocardial infarction (MI) registers, have documented higher MI case-fatality rates in lower social classes as a possible contributor to explain the SES gap in CHD morality; but only two of them evidenced a lower access to diagnostic procedures and treatments, i.e. coronary angiography and rehabilitation programs, among patients of the lower SES class. More recently we reported a narrowing if the socio-occupational gap in survival after acute MI in northern Italy, as a consequence of a more efficient and qualified out-of-hospital interventions. Some studies have assessed the relationship between social classes and CHD incidence, using more frequently either occupational or educational classes. Most of them assessed the contribution of major risk factors to explain the observed associations; but only a few of the former explored the contributions of work environment and job strain, then focusing on causality in addition to the identification of more efficient prevention policies to reduce social inequalities in health. None of such studies have been carried out in southern Europe, then consistency of results in different socio-cultural context may be questionable. On these grounds, the most relevant evidences linking occupational classes and CVD mortality and incidence will be reviewed, giving specific emphases to the studies that investigated work-related risk factors in addition to major coronary risk factors, as possible explanation for the occupational differences in disease outcome. In addition preliminary results of an ongoing study in Italy investigating a large variety of job titles in the public ad private sectors, and giving a comprehensive *spectrum* of occupational class (OC) differences in 12-year incidence of CHD, will be presented. The contribution of major coronary risk factors seem to be limited in size, and the contribution of job strain (JCQ) seems to be present only for employed workers, but not for high level of management and for self-employed people. This may be evidence for revising the Karasek model to include new forms of stressors in the work environment, at large.

Key words:
Socio-economic status, Educational classes, Coronary heart diseases

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THE PATHWAYS BETWEEN JOB STRESS AND CARDIOVASCULAR ILLNESS DEVELOPMENT: A COMPARISON OF THE ALLOSTASIS AND THE STRESS-DISEQUILIBRIUM THEORY APPROACHES

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Abstract

Does the Allostasis theory predict different work/CVD illness outcomes, and different stages of illness development than the Stress Disequilibrium Theory — the generalized version of the Demand/ Control Model's "job strain" hypothesis, which has been used so often to test work stress/CVD associations?In the recently developed Stress Disequilibrium Theory, internal regulatory control failure (self-regulatory physiological coordination failure) occurs in the context of high environmental demands and adaptive loads — with an emphasis on problems associated with loss/creation of internal and external control capacity. This new theory encompasses both equilibrium and adaptive development by proposing how disordered energy in the environment is transformed into complex organism functional capacity, using ideas originating in physics (thermodynamic laws). This systems theory-related approach allows discussion of both external and internal environmental factors, and new discussions linking physiological response to societal and economic contexts.Growth and regeneration are also implied by the Allostasis focus on "achieving stability through change". Furthermore, the original Active/Passive Demand/Control model hypothesis, predicts conditions for growth. This is reflected in the Stress-Disequilibrium theory's system-level companion theory, the Conducivity Model, which looks at growth in complex systems (albiet at a high organizational level). Here, discussion focuses on how combinations of capabitiies integrate into higher level organism capacities for action and internal control. The Conducive development processes are the opposite processes of the Stress-Disequilibrium's self-regulatory failures and disadvantageous equilibrium shifts, which contribute to disease.In summary: how do Allostasis and Stress-Disequilibrium approaches differ with respect to detailed predictions of CVD development?

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IMPROVING THE PSYCHOSOCIAL WORK ENVIRONMENT IN PRACTICE. REAL LIFE CHALLENGES AND OPPORTUNITIES

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Abstract

The ultimate goals of occupational health psychology as well as occupational medicine are to improve the working conditions of employees and to help create sustainable and healthy workplaces. This paper will focus on psychosocial factors at work. the following main question is addressed: How can researchers collaborate with the workplaces in the effort to improve the psychosocial work environment? First, a number of obstacles, barriers and common misunderstandings will be addressed. Then, a number of opportunities and possibilities will be outlined.

A. Obstacles and barriers:
   1. The goal of workplaces and companies is not to improve the health of workers but to increase productivity, quality and profits.
   2. Researchers seem to believe that "scientific evidence" in itself is a strong motive for changing behavior or working conditions. This is not the case.
   3. Most research models are much too vague and imprecise to be implemented in practice.
   4. Scientific evidence is often mixed, confusing and contradictory. Researchers often disagree.
   5. Most of the diseases — such as heart disease or depression — studied in the research are rare in most workplaces.
   6. The possible economic benefits of implementing improvements are vague and uncertain.
   7. Researchers are difficult to understand.
   8. Researchers give higher priority to writing articles than to using time on tedious meetings, writing popular material and waiting for positive effects.

These obstacles and barriers are real and should be taken seriously by researchers. But they can be overcome:

B. Opportunities and possibilities:
   1. Collaboration with workplaces should build on mutual trust. It takes many months to build trust.
   2. The research should (also) address issues of immediate interest for the workplace: Absence, turnover, employee motivation and involvement, productivity, product quality, customer satisfaction, customer loyalty, profits.
   3. Workplace surveys should not be limited to the usual — and vague — factors such as "demands", "control", "rewards" etc. a comprehensive and context specific survey will catch the interest of employees as well as employers.
   4. Results should be reported quickly, briefly, and in an understandable manner.
   5. Decisions about possible interventions, changes and improvements should always be taken by the people of the workplace.
   6. The research should address short term as well as long term effects. Many years of collaboration is needed.
   7. The researcher should have positive and frank relations with management as well as employees. One-sided ties should be avoided.
   8. The researcher should not accept limitations with regard to scientific publications.

Key words:

Psychosocial research, Prevention, Workplace improvements, Collaboration, Research

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A ROLE OF OCCUPATIONAL MEDICINE DOCTOR IN A CARDIOVASCULAR RISK REDUCTION THROUGH PERFORMANCE OF THE PFIZER'S "SMOKE FREE WORKPLACE" ANTI-NICOTINE PROGRAM

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Abstract

Smoking is one of the main causes of the cardiovascular diseases risk. About ten million people in Poland smoke cigarettes regularly and persons of working age smoke most often. The reduction of smoking in workplace may benefit a lot. Occupational medicine doctors may contribute to improving employees' health, reducing the rate of sick leaves and enhancing the work effectiveness by taking certain steps supporting the smoking cessation. The process of giving up smoking is not an easy task and requires appropriate approach and therapeutic methods. The "Smoke Free Workplace" anti-nicotine program has already been conducted in several workplaces in Poland and it proves that the work environment and conditions may favor reaching notable effects in smoking reduction. The program comprises the internal communication, education, medical consultations, pharmacological and behavioral support. Hoverer, the aspects of practical program planning and performance, such as company management acceptance, HR support and employees' engagement, are of great importance too. The occupational medical doctor plays a crucial role in coordinating the program and conducting therapy. The objective of such a therapy is to achieve high level of motivation to quit smoking, choose the appropriate pharmacotherapy and provide assistance in behavioral modification on an individual basis.

Key words:

Cigarettes, Cardiovascular diseases, Smoke free workplace, Antinicotinic program

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NEW MODEL OF HOME-BASED TELE-MONITORED CARDIAC REHABILITATION

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Abstract

Physical training (PT) is now recommended as an important component of a comprehensive approach to the patient with heart diseases. A growing body of research demonstrates that participation in exercise training improves exercise capacity, functional class, peripheral hemodynamics, autonomic function and quality of life. Moreover, an improvement in functional capacity is associated with lower rates of mobility and mortality. However, despite these benefits, many patients are inactive. Little is known about factors that promote such patients' participation in exercise programs. Patients' acceptance of proposed models of rehabilitation seems essential. Home cardiac rehabilitation might possibly be accepted by patients. The concern about the safety and efficacy of home-based physical trening, early after discharge, led us to introduce a new tele-monitored cardiac rehabilitation programme based on walking training. The purpose of this presentation is also to compare the efficacy of a new home-based tele-monitored cardiac rehabilitation programme and standard ambulatory-based cardiac rehabilitation on cycloergometer. Our presentation demonstrated that in patients with heart diseases home tele-monitored cardiac rehabilitation is as effective and improves the quality of life as standard ambulataory cardiac rehabilitation on cycloergometers. Home tele-monitored cardiac rehabilitation improves adherence in cardiac rehabilitation. The new model of tele-rehabilitation can be an alternative for people who do not accept the standard ambulatory training on ergometer. Due to the limitations associated with the heart diseases, home tele-monitored cardiac rehabilitation seems an optimal form of comprehensive cardiac rehabilitation.

Key words:
Cardiac rehabilitation, Telemedicine

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HUMAN CAPITAL OPERATIONAL PROGRAMME IN POLAND — THE ROLE IN SUPPORTING EMPLOYEES' HEALTH

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Abstract

The legal basis for the Operational Programme is provided in Council Regulation (EC) 1083/2006 (The General Regulation), laying down the general provisions of the European Regional Development Fund, the European Social Fund and the Cohesion Fund. Structural funds create an opportunity to realize the goals of the new Lisbon strategy. The Operational Programme Human Capital (OP HC) is one of the elements in an implementation system of the National Strategic Reference Framework 2007–2013, whose strategic objective is creation of appropriate conditions for increase in competitiveness of knowledge based economy and entrepreneurship, which assure higher employment and an increase in the level of social, economic and spatial cohesion. Nofer Institute of Occupational Medicine takes part in Priority II, i.e. development of Human Resources and adaptation potential of enterprises and improving the health condition of working persons. Specific objective is to improve the health state of working persons through development of preventive programmes and programmes supporting return to work. Expected effect of the programme is development of 10 complex preventive programmes and programmes that support returning to work for particular employee groups/professional groups. Occupational or work-related diseases included in the programme are: infectious, allergic, skin diseases, vocal disorders, chronic diseases of locomotor or peripheral nervous system related to the way the job is performed, hearing loss, peumoconioses, cardiovascular diseases and psychosocial disturbances.

Key words:

Operational Programme Human Capital, Occupational diseases, Prophylaxis, Return to work

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WHY CARDIOVASCULAR DISEASES AND WORK

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Abstract

Cardiovascular diseases (CVD) is a worldwide pandemic, rapidly worsening in many areas of the world undergoing industrialization, and displaying all the characteristics of a disease(s) driven by socioeconomic factors. While the major risk factors for CVD have been identified for many years a complete understanding of the etiology of the two most critical risk factors in the development of coronary artery disease — weight gain (i.e., obesity) and hypertension remains elusive. During the past 30 years a large body of research has emerged implicating work, particularly work organization and psychosocial stressors, as having a key role in promoting elevations of blood pressure yet intervention efforts have lagged. There has been much less research on the role of work in the development of obesity (perhaps due to the idea that obesity is simply the consequence of overconsumption). With regard to obesity it has long been understood that jobs characterized by increasing sedentary labor resulting from industrialization are an important contributing cause to the development of obesity. Recent studies suggests that psychosocial stressors, such as job strain, also play a key role in promoting weight gain. The implications of these findings for public health approaches to management of these epidemics and for proactive prevention at the workplace will be discussed.

Key words:

Cardiovascular diseases risk factors, Job strain, Psychosocial stressors

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EFFORT-REWARD IMBALANCE AND CARDIOVASCULAR DISEASE

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Abstract

In the context of economic globalization work pressure is increasing in many sectors of the labor market, often in combination with inappropriately low wages and reduced job security. The theoretical model of effort-reward imbalance at work was developed to identify health-adverse effects produced by these and related features of a stressful psychosocial work environment. The model claims that recurrent lack of reciprocity between efforts spent and rewards received in turn elicits strong negative emotions and associated stress reactions with unfavourable long-term effects on health. Rewards concern salary, promotion prospects including job security and esteem at work.

In this lecture, a summary of empirical evidence on associations of effort-reward imbalance with cardiovascular risk and disease is given. Results are based on prospective or cross-sectional observational studies, experimental investigations or studies using ambulatory monitoring techniques. In a majority of cases significant associations of components of the model with cardiovascular risk and disease are observed. Special attention is given to associations of effort-reward imbalance with depression, an established cardiovascular risk factor. Moreover, the contribution of psychosocial stress at work towards explaining the social gradient of cardiovascular diseases is elucidated.

Finally, policy implications of available evidence for worksite health promotion in organisations are discussed, addressing the three interrelated levels of structural, interpersonal and personal intervention measures. In view of current challenges of economic globalization, national and international regulations are required that enable and secure fair exchange at work.

ABSTRACTS

ORAL PRESENTATIONS

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STRESS MANAGEMENT INTERVENTIONS IN THE WORKPLACE IMPROVE PERCEIVED STRESS REACTIVITY: A RANDOMIZED, CONTROLLED TRIAL

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Abstract

Background: Occupational stress management interventions provide a promising strategy to reduce distress. The aim of this trial was to examine the effects of a stress management intervention (SMI) on perceived stress reactivity, mental health and somatic stress correlates. **Methods:** The trial was conducted at an industrial workplace. 174 employees in a "sandwich position" were randomly assigned to a SMI or a waiting control group. The program comprised 18 hours of training focused on individual work stress situations. The primary endpoint was the Stress Reactivity Scale (SRS), while secondary endpoints were effort-reward imbalance, anxiety, depression, functional somatic complaints, and salivary cortisol resp. amylase as somatic stress correlates. One year later, assessments were repeated in 154 participants. **Results:** The SRS decreased in both groups. A two factor analysis of variance with repeated measures showed a significant time by group effect [$F = 5.932$; $p = 0.016$] with the greater reduction in the intervention group. For SRS the effect size at 11 months post intervention was $d = 0.416$ in the intervention group and $d = 0.166$ in the controls. For effort-reward imbalance, depression and anxiety the improvements in the intervention group were higher, yet did not reach statistical significance. For cortisol resp. amylase only time effects were found. **Conclusions:** SMI is effective in reducing perceived stress reactivity in employees in a "sandwich position". Other mental health parameters and the effort-reward imbalance improve, but no significant interaction effects were found. Somatic stress correlates didn't show relevant changes.

Key words:
Stress management intervention, Workplace, Perceived stress reactivity, Somatic stress correlates

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IS WORKING IN NORMOBARIC HYPOXIA A RISK FACTOR FOR CARDIAC DISEASE? A ONE YEAR COHORT STUDY

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Abstract

Background: A new fire protection technique is rapidly spreading in European countries: In order to protect IT rooms, stocks containing highly inflammable chemicals, frozen food and other goods the room atmosphere is enriched by nitrogen, thereby lowering oxygen in the range between 15 to 13 Vol%. Air pressure remains unchanged (normobaric hypoxia). The resulting the oxygen partial pressure — and its physiological effects — correspond to hypobaric hypoxia in 2700 to 3850 m altitude. By working in fire protected rooms, far more than 1000 persons in Germany and an unkown number in other countries are exposed. In contrast to hypoxia in high altitude, persons who enter the rooms are fully exposed within seconds. Tasks and length of stay in the rooms vary. Sudden hypoxia is a powerful stressor to the cardiopulmonary system. This cohort study's primary question was whether exposed workers are at increased risk for acute cardiac events as myocardial infarction or rhythm disorders. **Method:** Of all companies in Germany that have employees working in normobaric hypoxia 45 supported access to exposed persons and their collegues who were not working in hypoxia, serving as controls. We included 351 exposed persons (38±9 years old) and 305 control persons (41±9 years). After a personal baseline examination, all participants prospectively recorded complaints and diseases during one year — daily during the first months (primarily to register minor complaints), monthly during the following 11 months. All reported medical events were verified by our medical team. The follow-up concluded with a second personal examination. **Results:** Cardiopulmonary complaints as dyspnea, chest tightness, heart pounding or palpitations were not more frequent in the exposed compared to the controls. However, within the exposed group, frequency of exposure, physically demanding tasks, lower oxygen concentrations and the combination of those increased the frequency of complaints. Although there were more events heart rhythms disorders in the exposed (5 vs. 0), the underlying problems were heterogeneous, not serious and without any temporal association to the exposure. No acute coronary event occurred. Blood pressure remained unchanged over the year. By analysing newly exposed people separately a healthy worker effect could be largely excluded. **Conclusions:** Working in normobaric hypoxia applied for fire protection may — as expected from known physiologic mechanism — increase cardiopulmonary strain. However, there is no indication that it does increase the risk for an acute cardiac event or another cardiac disease.

Key words:
Normobaric Hypoxia, Fire prevention, Cardiopulmonary strain, Health risk, Acute cardiac event

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PREVENTION OF PSYCHO-EMOTIONAL STRESS FOR PROPHYLACTICS OF CARDIOVASCULAR DISEASES AMONG BUS DRIVERS

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Abstract

The bus drivers are exposed to multiple occupational risk factors, resulting and associated with development of cardiovascular diseases (CVD), high blood cholesterol, overweight, type-2-diabetes. Objective of the presentation is evaluation of psycho-emotional and vegetative nervous system status among bus drivers with cardiovascular pathology. Material and methods: Using the special methods, the psycho-emotional condition and vegetative nervous system were investigated in the group of 156 bus drivers, mean age 45.7±5.5, suffering with arterial hypertension, coronary heart disease (CHD) or their combination. It was found the significance of emotional stress and correlation of emotional stress level with development of CVD. As result of our study the complex of the earlier CVD diagnostic methods among bus drivers was offered. Efficiency of the "biofeedback" method for decreasing of psycho-emotional stress as a measure of the CVD prevention in bus drivers was proved.

Key words:
Psycho-emotional stress, Cardio-vascular diseases, Prevention, Bus drivers' health

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BLOOD CIRCULATION REGULATION IN HUMAN-OPERATOR UNDER SHIFT WORK

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Abstract

Objectives: to reveal the differences in human-operator bloodcirculation regulation under standard and non-standard working hours at the within-system, between-system and over-system levels. **Materials and Methods:** Blood pressure (BP), heart rate and cognitive performance were tested in both control room shiftworkers at a heat power plant (375 human-observations) under 8-h shifts and electricity distribution network controllers (1224 human-observations) under 12-h shifts. A 5-anchor scale was used to estimate the perceived levels of fatigue, stress and work tension experienced by each controller. Data were analysed at $p < 0.05$. **Results:** Normal bloodcirculation selfregulation was broken under 2nd 12-h shifts. Only morning shifts were started under high correlation between cardiovascular system (CVS) activity and cognitive performance that gradually attenuated towards the shift-end. Age-experience misbalance in bloodcirculation regulation from sympathetic and parasympathetic parts of vegetative nervous system at the evening and night shifts (due to the Kerdo-index) was found. Paradoxical reaction in BP to the work load increase was revealed at the 2nd 12-h shifts. The decrease in reactivity and central coordination in haemodynamic parameters changes as a reply to work load increase (due to MANOVA, Pillai's test) were found at the night 12-h shifts. Age-experience deterioration in CVS functioning was more pronounced at the evening, night and 12-h shifts. **Conclusions:** The revealed misbalance in bloodcirculation regulation at the within-, between- and over-system levels reflects the mechanism of the weakness in CVS possibilities to maintain the shiftworkers performance under non-standard working hours. Working under non-standard hours could result in the increased risk of CVS pathology development.

Key words:
Cardiovascular system, Shiftwork, Human-operator

The number and title of the project under which the study has been carried: N 0196U009097 "Chronobiological regularities of physiological maintenance of cognitive performance in control room shiftworkers".

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WOMEN WORKERS. THINKING ABOUT THE GENDER DIFFERENCES ON PSYCHOSOCIAL EXPOSURES AND CV OUTCOMES

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Abstract

Psychosocial factors are one of the main work exposures associated with CVD. Women and men are both exposed to adverse psychosocial factors due to work organization, the increased job uncertainly and formal jobs and decreased job protection and social benefits. However, some important differences have been documented such as women tend to be distributed widely in part-time jobs, in lower level of the organizations' hierarchies and across the service sector. There are many examples of wages differences and specific tasks between men and women for the same job title; at the same time, women tend to be more exposed to segregation, sexual harassment and discrimination at work. Many studies have showed how home exposures are another major contributor of psychosocial load for women. On the other hand, there are some biological differences which have lead women to be under-diagnosed, under-treated and poorly rehabilitated in cardiac care until recent years, when women mortality and morbidity due to CVD has shown to be as high as men's. However, hormones protect women at younger ages and there are consistent differences in biological markers performance that should be taken into account when studying CVD markers, such as HRV and job psychosocial exposures. Gender-based analysis is not always possible when the study design was not consider the gender approach and usually result in more gender related questions not yet answered. Psychosocial gender-related approach would help identify risk factors for both women and men, and according to some researchers statement, both women's and men's occupational health problems merit scientific attention.

Key words:
Women workers, CVD, Confounding, Effect modification, Gender-based analysis

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PSYCHOSOCIAL JOB CHARACTERISTICS AND ACTIVE LEISURE-TIME PHYSICAL ACTIVITY IN THE US WORKFORCE

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Abstract

Objective: To investigate whether or not psychosocial job characteristics are associated with active leisure-time physical activity (LTPA) in the US workforce. **Materials and Methods:** This secondary data analysis was based on the National Survey of Midlife Development in the United States (MIDUS) II dataset (2004–2006). The analysis included 955 male and 956 female workers (age range: 32 to 69), who completed both the initial telephone interview and the mailed questionnaire of the MIDUS II study. The dataset was analyzed with stratifications by socioeconomic status (high = university/graduate school graduate; middle = some college education, but unfinished; low = high school graduate and lower education) and gender. **Results:** After controlling for the covariates (e.g., sedentary work, socio-demographic variables, chronic diseases, smoking, alcohol consumption, and obesity), low decision authority and low job control (for high-status males), low skill discretion (for middle-status males), and long working hours per week (for low-status males) increased the risk for non-active LTPA. Having a passive job (low job control and low job demands) increased the risk for non-active LTPA in high-and middle-status males. Having a high strain job (low job control and high job demands) increased the risk only in high-status males. In low-status females, low skill discretion marginally increased the risk for non-active LTPA. "No immediate supervisor" was a contributor to active LTPA in middle-status female workers. Obesity was negatively associated with active LTPA in both men and women, across social strata. **Conclusions:** The leisure-time physical activity of the US workforce under an obesity epidemic may be strongly influenced by the ways in which work is organized.

Key words:
Job control, Job demands, Passive job, Obesity

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SEDENTARY WORK, LOW PHYSICAL JOB DEMANDS, AND OBESITY IN US WORKERS

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Abstract

Objective: To examine whether low physical activity at work (sedentary work or low physical job demand) is associated with total and central obesity in US workers. **Methods:** The analysis included 955 male and 956 female workers (age range: 32 to 69), who completed both the telephone interview and mailed questionnaire of the National Survey of Midlife Development in the United States (MIDUS) II study (2004–2006). Sedentary work and physical job demand were each measured by one questionnaire item. Total obesity (based on body mass index) and central obesity (based on waist circumference) were defined using WHO criteria. **Results:** After controlling for covariates (socio-demographic, psychosocial work characteristics, health status, and health behaviors including leisure-time physical activity and stress-induced overeating), sedentary work, low physical job demand, and their combination increased the risk for total and central obesity only in male workers, particularly when they worked longer than 40 hours per week. The risk of the combination of sedentary work and low physical job demand for central obesity was greater than those of either lack of leisure-time physical activity or stress-induced overeating in the longer working male group. **Conclusions:** Low physical activity at work is a significant risk factor for total and central obesity in middle-aged US male workers. Increasing opportunities for physical activity at work and/or reducing long work hours could contribute to obesity prevention. More studies are needed to understand the role of physical activity at work in the obesity of US female workers.

Key words:
Total obesity, Central obesity, Physical activity, Leisure-time, Overeating, Work hours

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WORK STRESS AND OVEREATING COPING IN THE US WORKFORCE

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Abstract

Objective: To examine whether psychosocial working conditions are associated with stress-related overeating in the US workforce. **Methods:** This secondary data analysis was based on the National Survey of Midlife Development in the United States (MIDUS) II dataset (2004–2006). The analysis included 955 male and 956 female workers (age range: 32 to 69), who completed both the initial telephone interview and the mailed questionnaire of the MIDUS II study. Stress-related overeating (SO) was measured by the following two questionnaire items on stress coping: "I eat more than I usually do" and "I eat more of my favorite foods to make myself feel better". **Results:** 29% of the sample reported that they coped with stress by overeating: female workers were twice as likely to be stress-related overeaters as male workers (39% and 20%, respectively). High job demands and low supervisor support increased the risk for SO in males after controlling for the covariates (e.g., socio-demographic variables, chronic diseases, health behaviors, and obesity). Low job control, low coworker support, and long working hours per week increased the risk for SO in females. High strain (low job control and high job demands) and passive (low job control and low job demands) jobs increased the risk for SO in female workers, but no such effect in male workers. **Conclusions:** Adverse psychosocial working conditions were associated with stress-related overeating behavior in the US workforce under an obesity epidemic.

Key words:
Job control, Job demands, Social support, Job strain, Work hours, Obesity

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THE ASSOCIATION BETWEEN JOB STRAIN AND BLOOD PRESSURE VARIABILITY IN MIDDLE-AGED MEN AND WOMEN

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Abstract

Background: It has been suggested that 24-hour blood pressure (BP) variability is prognostic for cardiovascular morbidity, over and beyond mean BP level. The aim of this study was to assess the relation between perceived job strain and measures of BP variability in a sample of middle-aged workers. **Materials and Methods:** Results are based on observations in 170 healthy subjects (60% male, mean age 51 years) from the Belstress II study (2002–2003). Perceived stress at work was measured by means of the Job Content Questionnaire, based on the Demand-Control-Support model. On a regular working day, participants wore an ambulatory BP monitor (Spacelabs Medical) during 24 hours. BP variability was defined as the standard deviation (SD) of wake and sleep ambulatory BP, and the ratio of mean wake over sleep ambulatory BP. Non-dipping was defined as a decline from wake to sleep BP of less than 10%. Independent associations were studied by analysis of covariance and logistic regression analysis. **Results:** A significant crude association was found between high job strain and higher SD of ambulatory sleep systolic BP. After adjustment for gender, age, body mass index, smoking and physical job demands, isolated strain was significantly related to higher SD of sleep systolic BP and borderline significantly to higher SD of sleep diastolic BP. No significant associations were observed between job strain and the ratio of wake over sleep ambulatory BP or with non-dipping. **Conclusions:** Job strain was weakly associated to short-term but not wake/sleep BP variability in a sample of middle-aged workers.

Key words:
Work, Blood pressure

The BELSTRESS study.

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MULTISCALE MODELING OF HEART RATE VARIABILITY IN HIGH STRAIN JOB AND EXHAUSTED SUBJECTS

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Abstract

Background: Multi scale modeling allows proper consideration of the physiological origin as well as environmental influences over multiple scales in the interpretation of field collected heart rate variance. The ecological — physiological interactions measured by multi scale modeling are proposed as robust approaches for classifiying the consequences of high job strain (high demands, low control), as well as pathways toward and including exhaustion of neurocardiological regulatory systems. This paper presents reduced vagal cardiac control variability in exhausted and high strain job subjects. In addition, a method for testing the hypothesized relatinoships between high job strain and exhaustion, as reduced robustness in neurocardiological regulation, is proposed. **Materials and Methods:** Job strain was measured using the Job Content Questionnaire, 8/day diary reports, and a nationally standardized occupational code linkage in 36 healthy mid-aged males with varying control jobs. Subjects were Holter-monitored for 48 hours, including a work and rest day, and responded to questions on a daily diary as well as on the Job Content Questionnaire to test for exhaustion as a dichotomous state variable. Vagal cardiac regulation was measured by components of electrocardiograph output: the heart rate variability based measures of high frequency power (HFP). A sliding window of beat to beat HRV was used to estimate a continuous function of vagal regulation which was then used to compare short term, and extreme value vagal regulatory variability between high (n = 10) and low job strain (n = 22) subjects as well as subjects categorized as exhausted (n = 4). **Results:** A repeated measures ANOVA controlling for age confirms reductions in vagal regulatory variability in high job strain subjects (0.01), with further reductions in subjects reporting exhaustion (p = 0.001). This analysis supports the hypothesis that job strain and exhaustion are associated with reduced robustness in neurocardiological regulation via vagal pathways. **Conclusions:** Further work to establish the relationship between robustness and neurocardiological regulation and its role in chronic disease development from job strain is required.

Key words:
Exhaustion, Job strain, Heart rate variability, Multi scale modeling

Carried out as part of Job Strain and Heart Rate Variability Project.

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NIGHT AND SHIFT WORK AND CARDIOVASCULAR PROBLEMS

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Abstract

There is unanimity among researchers that shift work especially including night shifts may affect workers' health. Only a small group of 3–10% tolerate it relatively well when 20–30% is forced by health problems to quit it. Remaining majority is able to continue working shifts until retirement suffering from shift work related health problems. Although there is no occupational disease specific to shift work, it may facilitate, aggravate, accelerate various pathologies. When sleep problems are still the typical complaint of majority of shift workers, the peptic ulcer lost its dominating position for cardiovascular problems and cancer. According to results of longitudinal and case-referent studies shift work may be considered as a factor increasing the risk of coronary heart disease by 30–40%. The role of internal dissynchronization as a casual factor is still under discussion. On the other hand shift work enhances such a risk factors of CHD like hypertension, dyslipidemia, obesity, metabolic syndrome and type II diabetes as well as behavioral like smoking, drinking and lack of exercise. The different opinions of researchers result from difficulty of research and many confounding factors. The chronobiological influence is a factor of relatively low expression. In comparison with their day working counterparts shift workers are usually exposed to more harmful and arduous work place factors acting simultaneously. The apparent role of selection may result in "healthy worker effect" with findings pointing to the better health of workers starting shift work and after many years on the job when their "weaker" colleagues dropped-out already.

Key words:
Night work, Shift work, CHD, Hypertension, Shift work coping

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HEALTH RISK ASSESSMENT IN OCCUPATIONAL EMF EXPOSURE

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Abstract

Objective: Preliminary health risk evaluation in occupational eposure to electromagnetic fields-physiotherapy. **Material and Methods:** First, we proceeded to electromagnetic characterization of the worplaces by making measurements of the fields components. The group taken into study consists of 55 medical nurses in balneo-physiotherapy.We applied a special individual questionaire for electromagnetic fields, made clinical and paraclinical examination; we performed micronucleus test, full blood count, and thioeters assay from urine. The results of exams, compared to a control group, were processed in statistical restrospective analysis. **Results:** Comparing to ICNIRP 1998 protective limits, we found an overexposure to diathermy and magnetodiaflux procedures. The group taken into study presented affected health estate: asthenovegetative and nervous system syndroms, cardiovascular symptoms (arrhythmia, ischemic heart failure) in significant (SSD) relationship with exposure values. The values from micronucleus test were increased (SSD) comparing to control group. The urinary thioeters assay showed increased values at the group exposed to electromagnetic fields. **Conclusions:** The exposure to increased values of EMF at physiotherapists and the results concerning the affected health estate lead to the conclusion that this profession should be considered as "occupationally exposed to electromagnetic fields risk". That impose a special health monitoring for this professional cathegory and also special protective measures, including limitation of exposure. The associate health impairment with increased values of micronucleus and urinary thyoeters suggests that these tests could be exposure and biological effect markers.

Key words:
Physiotherapy, Electromagnetic fields, Exposure risk, Internal exposure, Biological effect markers

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CARDIOVASCULAR MANIFESTATIONS AMONG WORKERS IN MEAT PRODUCTION EXPOSED TO COLD ENVIRONMENT

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Abstract

Background: The term "Meat Industry" refers to organizations involved in the manufacture (slaughtering, boning, slicing and Packing) of meat products, except poultry. Meat processing sectors share the characteristic that they all handle commodities which are highly perishable and need to be processed in cold temperatures from the viewpoint of food safety. Moreover, due to increasing volumes of trade in frozen commodities, as well as the growing popularity for frozen products, an increasing number of workers are required to work in much colder temperatures. These conditions contribute to occupational health hazards. Our research team were aiming at studying the association of occupational cold exposure in meat industry and cardiovascular problems, together with clarifying some of the biochemical changes underlying these vascular manifestations. **Subjects and Methodology:** The index subjects are all workers in meat processing work-shop, in one of the biggest meat production factory. They are exposed to cold environment 8 hours/day for 5 days a week. A referent group matched for age, sex, socio-economic status, smoking habits from the same factory (administrative department), will also be enrolled in our study. All subjects will be personally interviewed and they responded to a constructed-questionnaire including occupational history (present and past), including duration of exposure, materials used and protective measures, if any, medical history including personal history, complaint, present, past and family history. Subjects' evaluation will include full clinical examination, resting ECG testing and the following investigations: 1) Complete blood picture, 2) Total lipid profile, 3) Plasma thrombin, 4) Plasma fibrinogen, 5) Platelete aggregability, 6) Cryoglobulin. Assessment of peripheral circulation for all examined subjects will be performed by Duplex for upper Rt. arm. **Findings:** It was found for the exposed 61 workers that they have chest manifestations in the form of dyspnea, chest pain and repeated chest infections. They also suffered from cardiac manifestations in the form of palpitation and fatigue. The peripheral vascular manifestations that they complained with were reduced dexterity of hands and feet and numbness, reduced tactile sensation, reduced joint motility, reduced grip strength, pallor and cold skin, and uncontrollable shivering. By studying the pathophysiology , we found a lot of variations in the biochemical parameters. There was a decrease in Hb, decrease platelet count, increase bleeding time, increase total cholesterol, increase LDL, decrease HDL and a positive finding of cryogobulin. These findings showed many variations when correlated according the different working places especially T.G as it was increased in the butcher and meat cutting section, the LDL showed increase in the packing section , on the other hand HDL showed marked decrease. ECG abnormalities were detected among exposed workers and a relation was detected with lower temperatures. Also duration of exposure to cold showed positive relations with deteriorated biochemical parameters that was measured. No detected abnormalities in angiography performed to all workers. **Conclusion:** Cold work-rest regimens must be complied with in all working places. Early biochemical changes indicative of cold exposure must be performed annually.

Key words:
Cold exposure, Meat industry, Cardiovascular impairment, Pathophysiological mechanisms

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ASSOCIATIONS OF OCCUPATION, JOB STRAIN, AND SUBCLINICAL CARDIOVASCULAR DISEASE IN THE MULTI-ETHNIC STUDY OF ATHEROSCLEROSIS (MESA)

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Abstract

Objectives: Occupation has been linked to cardiovascular disease (CVD) incidence and mortality, but few studies have investigated occupation in relation to early atherosclerotic disease. This study examined associations of occupational characteristics with carotid intima-media thickness (IMT) in a multi-ethnic sample. **Materials and Methods:** The Multi-Ethnic Study of Atherosclerosis (MESA), conducted in the United States (U.S.), recruited 6814 adults 45–84 years of age, free of clinical CVD. Questionnaire data were used to determine occupational group (managerial/professional, sales/office, service, blue-collar jobs), psychosocial job characteristics (i.e., psychological job demands, job control), and other sociodemographic information. Linear regression was used to examine associations of occupational group and psychosocial job characteristics with common and internal carotid IMT. **Results:** Common carotid IMT was greater for blue-collar jobs than for managerial/professional jobs ($b = 0.012$ mm, $p < 0.05$) after adjusted for age, sex, race, place of birth (U.S.- or foreign-born), and traditional CVD risk factors. Compared to managerial/professional jobs, the internal carotid IMT was greater for sales/office, service, and blue-collar jobs ($b = 0.071$ mm, 0.057 mm, and 0.110 mm, respectively; $p < 0.01$ for all). The difference in internal IMT between blue-collar jobs and management/professionals remained significant after sociodemographics, CVD risk factors, income and education were added to the model ($b = 0.048$ mm, $p < 0.05$). Higher job control was associated with decreased common carotid IMT ($b = -0.009$ mm, $p < 0.05$) but not with internal carotid IMT. Job demands had no significant association with IMT. **Conclusions:** Occupational status, especially being in blue-collar jobs, and lower job control were associated with subclinical atherosclerosis.

Key words:
Job demands, Control, Socioeconomic position, Atherosclerosis, Cardiovascular disease

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SYSTEMIC AND LOCAL RESPONSES TO STRESS IN SUBJECTS WITH CHRONIC MUSCLE PAIN AND HEALTHY CONTROLS

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Abstract

Objectives: Pain in the neck and shoulders are common problems in modern society. Maintenance of chronic pain may be caused by complex interactions between different physiological responses to stress. The study aimed to investigate the associations between systemic cardiovascular and local responses to stress in subjects with chronic muscle pain and healthy controls. **Materials and Methods:** 23 subjects with perceived pain in the neck and shoulders (females = 22) and 21 age and gender matched healthy controls (females = 20) participated in a laboratory experiment with quiet rest, sustained hand grip, cold pressor test and deep breath test. Physiological activity were assessed continuously through heart rate variability and blood pressure as well as by local recordings of muscle activity and blood flow using EMG and photopletysmography, respectively, of the upper part of the trapezius muscle. **Results:** The pain group showed attenuated responses to hand grip compared to controls. This included significantly lowered trapezius blood flow bilaterally ($p < 0.01$) and a tendency towards lower HR and BP. Pain group showed slightly elevated EMG amplitude for the ipsilateral trapezius during hand grip and higher resting muscle tone bilaterally after test. No effects were seen for cold pressor test. **Conclusion:** The results indicated impaired regulation of trapezius blood flow in chronic muscle pain which may be related to an aberration of systemic cardiovascular reactivity.

Key words:
Neck-shoulder pain, Stress, Blood flow, EMG, Heart rate variability

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JOB STRAIN AS A DETERMINANT OF HEART RATE VARIABILITY AMONG RESIDENT DOCTORS IN A GENERAL HOSPITAL IN MEXICO CITY

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Abstract

Objective: To evaluate the association of Heart Rate Variability (HRV) and job strain among resident doctors during their first year of residency in one of the public general hospitals in Mexico City. **Material and methods:** A panel study was conducted among 54 resident doctors during their first year of specialization in one general hospital in Mexico City. Two types of questionnaires were administered: 1) personal health background and 2) the Job Content Questionnaire. Heart rate variability was evaluated using Holter equipment through the frequency domain during a period of 24 hours and the parameter SDNN through the time domain. **Results:** Participants reporting high Job Strain, had a -22% (IC 95% -31.52, -11.40) smaller index of low frequency/high frequency compared with participants reporting low Job Strain. In addition, participants in low demand-low control (Passive) jobs had decreased SDNN, High Frequency power and Low Frequency power in comparison with Low Strain participants. **Conclusions:** We observed an association between Job Strain and the parameters SDNN, high frequency power, low frequency power and the Low frequency/high frequency index. We conclude that HRV analysis can be used to measure the effects of work stress.

Key words:
Job strain, Heart rate variability, Demand-Control model, Medical Doctor, Residents

Title of project: Job strain and heart rate variability: A prospective cohort study among medical residents in Mexican Hospitals.
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DOES HIGH PHYSICAL FITNESS PROTECT WORKERS WITH HIGH PHYSICAL DEMANDS FROM CARDIOVASCULAR MORTALITY? A 30 YEAR FOLLOW-UP IN THE COPENHAGEN MALE STUDY

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Abstract

Background: Workers with high occupational physical demands are at high risk for ischaemic heart disease (IHD) mortality. This may be due to a mismatch between the physical occupational demands and the required physical fitness for tolerating the cardiovascular workload. The aim of the study was to investigate whether high physical fitness modifies the excessive risk for IHD mortality from high occupational demands. **Materials and Methods:** In the Copenhagen Male Study, 5249 male workers aged 40–59 years performed a bicycle exercise test and reported occupational and leisure time physical activity in 1970–1971. The risk for IHD mortality to the end of 2001 from low physical fitness among male workers with low, moderate and high levels of occupational physical demands were examined with Cox's proportional hazards model. **Results:** Among workers with low and medium physical fitness, high physical occupational demands vs. low physical occupation demands increased the risk for IHD mortality (hazard ratio = 2.04, CI: 1.20–3.26, and 1.75, CI: 1.24–2.46). Workers with high physical fitness and high physical occupational demands were not at increased risk for IHD mortality (hazard ratio = 1.08, CI: 0.52–2.17). **Conclusions:** Workers with high occupational physical demands are not at excessive risk for premature IHD when having a high physical fitness. Workers with high physical occupational demands ought to be particularly recommended to participate in leisure time physical activity for improving physical fitness.

Key words:
Physical heavy work, Leisure time physical activity, Ischemic heart disease mortality

Project: Copenhagen Male Study.

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DOES LEISURE TIME PHYSICAL ACTIVITY INCREASE THE RISK OF ISCHEMIC HEART DISEASE MORTALITY AMONG MEN WITH HIGH PHYSICAL WORK DEMANDS? A 30 YEAR FOLLOW-UP IN THE COPENHAGEN MALE STUDY

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Abstract

Background: It has been suggested that men with high physical work demands should refrain from being physically active in their leisure time due to adverse effects on their cardiovascular health. The objective of the study was to test the hypothesis that a high level of leisure time physical activity (LTPA) increases the risk of ischemic heart disease (IHD) mortality among men with high physical work demands. **Materials and Methods:** 30-year follow-up in the Copenhagen Male Study of 5249 Caucasian male workers aged 40–59 years; 274 men with cardiovascular disease at baseline were excluded from the follow-up. Cox analyses of men with low (n = 1236), medium (n = 2651), and high (n = 858) physical work demands were carried out. **Results:** 591 men (11.9%) died due to IHD. Workers with high physical work demands had a higher risk of IHD compared to men with low demands (age-adjusted hazard ratio = 1.51 (95% CI: 1.18–1.94)). Overall, the age-adjusted hazard ratio for IHD mortality associated with a high level of LTPA was 0.49 (0.34–0.70) referencing men with a low level. Among workers with high physical work demands, a high level of LTPA vs. a low level of LTPA lowerede the risk for IHD mortality adjusted for age, blood pressure, smoking, alcohol, BMI, diabetes, hypertension, and social class(hazard ratio: 0.82 (0.42–1.56). **Conclusions:** The hypothesis was rejected. Among men with high physical work demands, a moderate or high level of LTPA was associated with a reduced risk of IHD mortality.

Key words:
Physical heavy work, Leisure time physical activity, Ischemic heart disease mortality

Project: Copenhagen Male Study.

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EFFICACY OF THE SMOKING CESSATION THERAPY IN WORKING PLACES WITHIN THE "SMOKE FREE WORKPLACE" PROGRAM — A MULTICENTER PILOT STUDY

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Abstract

Background: Approximately 10 million people in Poland smoke cigarettes. People that are in the productive age smoke most often. The reduction of smoking in working places may bring a lot of benefits. The aim of the study was to assess the efficacy of the nicotine addiction therapy among the employees of big workplaces in Poland. **Materials and Methods:** The study was divided into three phases including CATI survey in working places; a survey among the employees of companies willing to participate in the program; and a study of efficacy of the smoking cessation therapy among the employees. Continuous abstinence from smoking at the end of the 12-week treatment period was measured. **Results:** The first phase of the study was conducted in 1123 companies in Poland and the second in 4.77% of smoking employees supported the program, and a percentage of those who participated was 10%. On the whole, 38 people took part in the treatment phase: varenicline — 28 (73,7%), NRT — 1 (2,6%), no pharmacotherapy — 9 (23,7%). At the end of the 12-week period 21 patients were continuously abstinent from smoking, out of which 20 received varenicline. The percentage of patients who received varenicline and kept nicotine abstinence was 71,43%. **Conclusions:** A vast majority of the employees supported the health action in their companies. Only a small percentage of smoking employees who initially declared their participation started the treatment. The choice of varenicline by 95% of the subjects could cause a high efficacy of the therapy.

Key words:
Occupational medicine, Smoking cessation, Varenicline

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A WHO PERSPECTIVE AND THE WHO GLOBAL PLAN OF ACTION ON WORKERS' HEALTH

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Abstract

In May 2007 the 60th World Health Assembly unanimously endorsed the WHO Global Plan of Action on Workers Health 2008–2017. This Plan provides a political framework for development of policies, infrastructure, technologies and partnerships for achieving a basic level of health protection in all workplaces throughout the world. The Health Assembly also urged the 193 Member States of WHO to develop national plans and strategies for implementing the Global Plan of Action and to work towards full coverage of all workers with essential interventions and basic services for prevention of occupational diseases and injuries. The workplace is an ideal setting for numerous interventions. The progress made in implementing the WHO Global Plan of Action will be reviewed by the World Health Assembly in 2013 and 2018.

WHO organizes the work of the Global Network of Collaborating Centres in Occupational Health to provide direct support to achieving the objectives of the Global Plan of Action at the national and the international levels. The Network developed a 2009–2012 workplan addressing a number of priorities of the Global Plan. WHO is also scaling up its colaborative efforts with the International Labour Organization and is actively engaging in dialogue with the international organizations of trade unions and employers. The involvement of non-governmental organizations, particularly those in official relation with WHO, is important for implementing the Global Plan of Action. NGOs in official relations with WHO are the International Commission of Occupational Health, the International Occupational Hygiene Association and the International Ergonomics Association.

Keywords:

WHO Global Plan of Action on Workers' Health, WHO Collaborating Centres in Occupational Health

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PERCEPTIONS OF PSYCHOSOCIAL HAZARDS AND WORK-RELATED STRESS AND THEIR HEALTH IMPACT ACROSS VARIOUS DEVELOPING COUNTRIES

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Abstract

Major global developments have changed the world of work during the last few decades. There is an international trend to shift production to developing countries, with wide variations in working conditions and exposure to occupational hazards. These developments have also increased the research communities' interests in the psychosocial hazards working populations are exposed to and the impact of these on their health. These have rarely been addressed or explored in developing country contexts while we find an abundant body of research in industrialized countries. The study undertaken explores the perception and the nature of psychosocial hazards, work-related stress, and the health impact on workers in developing countries. Experts were drawn from a group of multi-disciplinary professionals with expertise in, or related expertise to, occupational health. The key findings presented are participants' perceptions of psychosocial risk-related health outcomes and can be viewed in terms of physical and psychological illness and disease, as well as health-damaging behaviours. The study obtained an interesting insight into an ill-researched area and found an understanding which is comparable to knowledge in industrialized countries, particular in terms of the demand-control-support framework by Karasek and Theorell. However, issues go beyond the workplace to include the social environmental context. It is hope that this study stimulates the development of legislative and/or preventive frameworks globally that address all work-related risk in a comprehensive manner.

Keywords :
Work-related stress, Psychosocial hazards, Health outcomes, Developing countries

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LONGER WORK WEEKS PREDICT SHORTER LIVES: RESULTS FROM A 17-YEAR PROSPECTIVE STUDY OF WORK TIME AND MORTALITY AMONG MIDDLE-AGED FINNISH MEN

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Abstract

Introduction: Studies of the relationship between work time and cardiovascular diseases (CVD) have been inconclusive. **Methods:** This prospective study of a representative sample of 2682 middle-aged men from Kuopio, Finland, evaluated effects of work time on mortality. Cox proportional hazard models adjusted for 21 biological, behavioral, and psychosocial cardiovascular risk factors including socio-economic status. **Results:** 3% worked 2–4 days, 75% — 5 days, 13% — 6 days, and 12% — 7 days per week. 785 men died during 17 years of follow-up. Each additional day worked per week increased mortality by 20% for all causes of death ($p = 0.005$), 36% for CVD ($p = 0.005$), and 52% for coronary heart disease (CHD, $p = 0.001$). Hours worked per day were not significantly related to these outcomes. **Conclusions:** The number of days worked per week is positively associated with all-cause, CVD, and CHD mortality in middle-aged men. These results are consistent with earlier findings of an association of work time with accelerated progression of atherosclerosis in this cohort. Regardless of the specific occupational conditions that may constitute the pathways for the observed relationships, findings suggest that reducing the number of days worked per week could have substantial cardiovascular and public health benefits, especially in the aging working population.

Key words:
Aging, Cardiovascular disease, Long work hours, Overtime, Prospective study, Shift-work

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REPRODUCIBILITY AND SEASONAL VARIATION OF AMBULATORY SHORT-TERM HEART RATE VARIABILITY IN HEALTHY SUBJECTS DURING A SELF-SELECTED REST PERIOD AND DURING SLEEP

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Abstract

Background: Ambulatory measurements of heart rate variability (HRV) are widely used to assess cardiac health of healthy subjects in relation to environmental or work-related exposures. However, little is known about the reproducibility and seasonal variation of this kind of measurements. **Materials and Methods:** Ambulatory ECGs from 19 healthy participants were collected monthly for 12 months, and weekly for one month for a subgroup of 12 participants. Frequency-domain HRV-metrics and ECG-derived respiratory frequency were calculated for 5 min ECG segments during (i) a 15-min self-selected rest period (awake period), and (ii) a 30-min sleep period starting 45 min after estimated sleep onset. Within- and between-subject coefficient of variation (CV) and seasonal variation were estimated and minimum detectable differences (MIDEDIF) calculated for all frequency-domain HRV-metrics. **Results:** The within- and between-subject CV varied from < 10% for ln(TP) and ln(LFP) to > 100% for ln(LF/HF). Within- and between-subject CV of ln(HFP), LFnu and HFnu were 10–40%. A small, but significant, seasonal variation was found for ln(TP), ln(LFP) and the respiratory frequency. **Conclusions:** Calculations of MIDEDIF demonstrated that the reproducibility was sufficient for ambulatory HRV measurements to be used to study autonomic cardiac regulation in healthy populations.

Key words:
Ambulatory monitoring, Reproducibility of results, Sample size, Periodicity, Seasons

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NEW RESEARCH DIRECTIONS IN CHRONIC DISEASE PREVENTION IN THE WORKPLACE

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Abstract

Objectives: Employers in the United States have adopted a wide range of workplace programs, policies, and practices intended to sustain and improve the health and well being of workers. Many such interventions are consistent with traditional health promotion, focusing on changing individual behaviors. On the other hand, evidence has accumulated supporting the importance of the physical and psychosocial work environment in contributing to many chronic illnesses and their associated health behaviors. Health promotion programs have traditionally ignored the contribution of the work environment and work organization in the development of "unhealthy" behaviors, which are themselves often compensatory responses to an "unhealthy" work environment. Recent studies have demonstrated the value of comprehensive programs that address both individual and organizational health. In addition, there are important research questions about when and how to initiate preventive approaches including screening tests, intensive lifestyle, job redesign and work organization interventions, and how to integrate organizational and occupational factors into health promotion activities in the workplace. **Materials and Methods:** The National Institutes of Health and the Centers for Disease Control in the United States plans to convene experts in worksite investigations for prevention of cardiovascular disease, cancer, and other chronic diseases drawn from academia, industry, and government. The forthcoming workshop to be held on May 21–22, 2009 is designed to identify and discuss the major research opportunities and gaps and develop a comprehensive research agenda on the integration of occupational health and worksite health promotion. **Results:** We will present the results of this workshop as it relates to cardiovascular disease, including developments in the field of occupational cardiology, as well as efforts to integrate occupational cardiology with programs to reduce unhealthy behaviors such as cigarette smoking, physical inactivity and an unhealthy diet.

Key words:
Occupational cardiology, Health promotion, Work organization, Cardiovascular disease, Psychosocial

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WORK STRESS AND BLOOD PRESSURE IN CHINESE UNIVERSITY STAFF

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Abstract

Background: The Chinese university staff and researchers are regarded as stressed population at work, and their cardiovascular mortality has been reported higher compared to general working population. This study was to examine the association between work stress and blood pressure in this population. **Materials and Methods:** An ongoing prospective cohort study is being conducted in China. The present analyses were focused on the baseline data of 1244 university staff at the age of 23–60 years old. Work stress was measured by the validated Chinese Effort-Reward Imbalance questionnaire, and the clinical blood pressure was obtained from the medical examination. **Results:** Using multivariate linear regression to adjust for relevant confounding factors, in women (n = 613), the systolic blood pressure was 1.41 (95% CI: 0.35–2.46) mmHg decreased by 1 standard deviation (SD) increase of reward (p = 0.0089), and 1.22 (95% CI: 0.06–2.38) mmHg increased by 1 SD increase of effort/reward ratio (p = 0.04); while the diastolic blood pressure was 1.11 (95% CI: 0.34–1.88) mmHg decreased by 1 SD increase of reward (p = 0.0045). No significant differences were found in men (n = 612). **Conclusions:** The results provids the positive evidence on work stress and blood pressure, particularly the effect of reward in women.

Key words:
Effort-reward imbalance, Blood pressure, University staff, China

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VASCULAR HEALTH IS CORRELATED TO THE NUMBER OF RISK FACTORS AMONG FINNISH AGING INDUSTRIAL WORKERS

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Abstract

Background: Vascular health plays an important role in the development of cardiovascular, musculoskeletal and cognitive disorders. Good vascular health promotes work ability. New IT technology and some new non-invasive determinants of arterial function were tested in the health promotion project conducted by occupational health care (OH). **Materials and Methods:** The vascular function of 109 subjects (72% males and 28% females, mean age 50 years) was studied by two noninvasive techniques. Vascular age (cardio-ankle vascular index, ankle-brachial index) was measured by technique based on blood pressure measurements and the velocity of pulse wave. (VaSera, Fukuda Co., Japan). Augmentation index (AI) of 74 employees was measured by a finger plethysmographic method (EndoPat, Itamar Inc., Israel). The cardiovascular risk factors were evaluated by questionnaires (health habits), physical examination (BMI, waist circumference) and laboratory measurements (lipids, glucose, sensitive CRP). **Results:** Risk factors were common. Two thirds of the subjects, however, considered themselves healthy. A clear correlation existed between the vascular age and the number of risk factors. Compared to the chronological age the mean vascular age of the subjects with 2 risk factors was +1.5 years, with 3 risk factors +2 years and with 4 or more risk factors +7 years. The correlation between the two indices of arterial stiffness (AI, CAVI) measured by two different techniques was significant ($r = 0.427$, $p = 0.001$). **Conclusions:** The multidimensional control of cardiovascular risk factors is important in OH. The non-invasive techniques might be useful in the individual health promotion.

Key words:
Arterial stiffness, Occupational health, Cardiovascular risk factors

The study was granted by Finnish Work Environment Fund , nr. 107226.

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BLOOD PRESSURE MONITORING AND PSYCHOSOCIAL RISK FACTORS IN CALL CENTER WORK

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Abstract

Background: To assess the relation between the demand-control (JDC) model and the effort-reward imbalance (ERI) model, and blood pressure monitoring in call-handlers. **Materials and Methods:** Participants (74 females, age 34.9±9.9 years; 26 males age 36.0±10.8 years) completed the Italian version of the JDC and the ERI questionnaires. Blood pressure was monitored for 24 h by the bp one OPCB Cardiette system over two workdays. Work schedule was classified as either favourable or unfavourable according to the personal judgement of the subjects. The relations between blood pressure and psychometric workload measures were assessed by the generalized estimating equations method while adjusting for potential confounders (gender, age, educational level, marital status, work schedule). **Results:** The mean arterial pressure (MAP) was 77.2±12.1 mmHg during the sleeping period (1450 obs), 88.5±13.6 mmHg during diurnal activities out of work (3361 obs), 91.9±12.4 mmHg during work shift from time 7:00 to 14:00 (1228 obs), and 92.0±13.9 mmHg during work shift from time 14:00 to 22:00 (829 obs),($p < 0.002$). MAP was significantly related with both work schedule preference and work shift. Unfavourable work schedule was associated with an increase of 2 mmHg in MAP compared with favourable work schedule ($p = 0.013$). Work shifts were associated with an increase of 3–4 mmHg and 14 mmHg in MAP compared with diurnal activities out of work and the sleeping period, respectively ($p < 0.001$). No significant relation was found between MAP and psychosocial factors evaluated by the JDC and ERI questionnaires. **Conclusions:** MAP in call-handlers was related to work shift and work schedule preference but failed to find a relation with psychosocial risk factors.

Key words:
Job strain, Blood pressure monitoring, Demand-control model, Effort-reward imbalance model, Confounding factors

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WORK STRESS AS RISK FACTOR OF CARDIOVASCULAR DISEASE IN WOMEN

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Abstract

Many studies performed on male workers have shown that job stress is important in understanding the occupational gradient in cardiovascular disease (CVD), but these relationships have rarely been studied in women. With increasing numbers of women in the workforce it is important to have a more detail explanation of how CVD risk may be mediated by job stress. Study aimed to examine whether psychosocial working conditions are associated with angina pectoris (AP) symptoms in women revealed that working overtime, work fatigue, high physical strain at work, and low job control were associated with AP (Lallukka et al., 2006). In one of the study carried out using the job strain model (Hammar et al., 1998) was found that among women in occupations characterized by high work strain the incidence of myocardial infarction (MI) was about 20% higher as compared with women in low strain occupations, also there was a higher incidence of MI for women in occupations with passive work. The higher incidence of MI was found also in occupations characterized by a combination of low social support at work and low decision latitude compared with occupations with high social support at work and high decision latitude. In other study concerning association between job constraints and hypertension (Radi et al., 2005) was found that in women, passive and active jobs were strongly related to hypertension. In this study social support at work was neither related to hypertension, nor did it moderate the relation of job constraints with hypertension. Also study carried out using effort-reward model (Peter et al., 1998) indicated that among women a measure of high intrinsic effort (immersion) was related to increased low density lipoprotein (LDL)-cholesterol. In other study analyzing the relationship between psychosocial factors at work defined by the effort-reward imbalance (ERI) model and self-reported health (Neidhammer et al., 2004) revealed that for women low reward was a significant risk. Overcommitment was also found to be a risk factor for self-reported health for women (cross-sectional analysis). Prospective analysis also showed that ERI was a significant predictor of poor self-reported health for women. These several examples show that occupational stress is among women like among men important risk factor of cardiovascular disease. However there are some differences between the effects of job stress in men and women.

Key words:
Women work, Job stress, Cardiovascular disease, Risk factors

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AN AGEING POPULATION: THE PART JOB STRAIN PLAYS ON THE PREVALENCE OF HYPERTENSION, TOTAL CHOLESTEROL AND WAIST TO HEIGHT MEASUREMENTS IN A COHORT OF THE IRISH GENERAL POPULATION

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Abstract

Objectives: Older people are more susceptible to ill effects from job strain resulting in higher associations between job strain and hypertension. Research on job strain would suggest that older male workers in the lower social class are more vulnerable to hypertension owing to higher or even cumulative effects of job strain. Unpaid women workers were also found to be at a higher risk. Research on this in Ireland is lacking. **Materials and Methods:** A 10 year follow up study was conducted on a cohort of the general population (59–80 year olds) in the Republic of Ireland. Anthropometric measurements, blood pressure, lipoprotein profile and data on medical history were collected on 157 study participants who were classified as having paid and unpaid employment. The job content questionnaire was used to assess job strain in paid and unpaid workers at follow-up. Blood pressure recordings were taken during a clinical examination using a validated instrument. Cardiovascular risk factors were defined as: a systolic blood pressure ≥ 140 mmhg, or/and a diastolic pressure ≥ 90 mmhg or/and a diagnosis of hypertension, total cholesterol levels > 5 mmols and waist circumference > half their recorded height. Analyses will compare cardiovascular risk factors for paid and unpaid workers. We will also conduct multivariate analysis of job strain and cardiovascular risk factors in paid and unpaid workers while adjusting for baseline risk factors and sociodemographics. **Results:** Data entry ongoing at present. **Conclusion:** The findings from this study will help to determine the 'causes of the causes' for cardiovascular disease in an older population.

Key words:
Job Strain, Hypertension, Total cholesterol

Project: Food and Health Group.

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HOUSEWORK AND HYPERTENSION DURING IN PREGNANCY

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Abstract

The evidence that psychosocial risks are important in the etiology of hypertension and may well have serious implications for public health. The exhibition can also adverse consequences, including arterial hypertension in pregnancy and negative psychological effects. Potentially stressful exposures are related to the family and increased their responsibilities and involvement in paid work. The aim of this study was to evaluate the association between the burden of housework and hypertension in pregnant women in Bahia, Brazil. This is a case-control study, cases were selected in an outpatient unit of pregnancy at high risk of a public hospital and control in health units. Family responsibilities and domestic work were evaluated by an indicator of domestic burden through the following activities: washing, ironing, cleaning and cooking, weighted by the number of residents of the house. The sample was comprised of 90 cases and 224 controls. Among pregnant women, 46.5% were under heavy load of domestic work. Pregnant women who were exposed to high domestic overload was found to reduce the risk of developing hypertension during pregnancy (RR = 0.64, OR = 0.53, p = 0.01). This study showed no positive association between burden of domestic labor and hypertension in pregnancy. It seems that the influence of pregnancy, the impact of burden of domestic work was minimized by becoming emotionally gratifying and not necessarily a negative emotional.

Keywords:
Housework, Domestic burden, Hypertension, Pregnancy

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PSYCHOSOCIAL WORK STRESS AND HYPERTENSION IN PREGNANCY

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Abstract

Epidemiological investigations of the association between job and cardiovascular illness increased drastically was introduced of Job Strain Model by Karasek. This model sustains the hypothesis that stress occurs when there is a labor situation with psychological demand and control (decision) at work, which provokes diverse effects on health, triggering both sympathetic-adrenomedular and adrenocortical that may result in a highly deleterious combination to health. The sympathetic nervous system has participation in the genesis, clinical presentation and maintenance of arterial hypertension (AH). The objective of this study was t o evaluate the association between psychosocial factors of professional work and AH in pregnant women. It is a controlled-case study, cases were selected at an ambulatory care unit of high risk pregnancy from a public hospital in Brazil and the controls at health units. The psychosocial aspects of the study were evaluated in relation to main job posit ions, using the Job Content Questionnaire (JCQ). The sample was formed by 90 cases and 224 controls. It was found a positive association between psychosocial aspects and AH (OR = 4.14) in pregnant women who had passive jobs when compared to the ones who had active jobs, though the use of a logistic regression model. A passive job implies that the job leads to the declining of an individual's global activity and the reduction of the capacity to produce solutions for faced activities and problems. In this study, the association between job psychosocial characteristics and AH was evidenced, strengthening the hypothesis that job stress during pregnancy increases AH risk.

Key words:
Psychosocial aspects, Work stress, Job Strain Model, Hypertension in pregnancy

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JOB INSECURITY — AN EMERGING RISK FACTOR FOR HEART DISEASE IN DENMARK?

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Abstract

Background: Prospective studies of populations twenty to forty years ago have found a relationship between high job strain and ischemic heart disease (IHD). Recent studies, however, have not found associations between high job strain and IHD. As the exposures at work have changed, other factors than job strain might play a role for IHD. **Materials and Methods:** As a part of the Copenhagen City Heart Study, 1.049 actively employed men and women from the general population in Copenhagen participated in a sub-study on working conditions and health in 1993–1994. They filled in questionnaires including questions on the job strain model mainly derived from the Whitehall II Study and in addition questions on job title, work place, civil status, leisure time activity, smoking, medication, social support, social relations, conflicts, job satisfaction, and job insecurity. They went through a medical examination, including measurements of height, weight, serum lipids, fasting glucose, plasma fibrinogen, and blood pressure. All deaths and hospital admissions due to IHD, including first myocardial infarction (MI) in the cohort were traced in the Danish registries of deaths and hospital admissions till November 2007. These data were used as dependent variables in gender separated logistic analyses of regression. As independent variables all the above mentioned variables concerning work were used in the analyses with conventional coronary risk factors, social status and age as intermediate variables. **Results:** 104 cases of first time hospitalization or death due to IHD occurred during 13 years follow up. High job strain was not associated with IHD. Odds ratio (OR) adjusted for age for high strain compared to the relaxed group was 0.5 (0.1–3.1) among women and 1.4 (0.4–4.9) among men. Adjustment for confounders did not change the estimates much. Neither demands nor control were significantly associated with IHD. Job insecurity was however strongly associated with IHD in men (OR = 5.5 (1.6–7.2)) and borderline associated in women (OR = 3.2 (0.7–6.7)) after all adjustments. The increased risk was only observed in the age group over 50 years. The risk was increased for MI too (OR = 2.7 (1.2–6.1)). The Items which contributed to these associations measured concerns about being superfluous due to new technology and worries about being able to find a new job if becoming unemployed. **Conclusion:** In this population, working in a period and society characterized by relative wealth and increasing employment rates no associations between IHD and job strain or its components were found. However, the feeling of job insecurity predicted both IHD and MI among men. Our results suggest that the significance of psychosocial factors at work might change over time and differ from one society to the next.

Key words:
Ischemic heart disease, Prospective study, Job strain, Insecurity

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TYPE OF SYMPATO-ADRENAL SYSTEM OF BUS DRIVERS REACTION TO PSYCHO-EMOTIONAL STRESS

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Abstract

Objective: Evaluation of the sympato-adrenal system reaction types in the bus drivers group in dependence of the existence and number of traffic rules violations and traffic accidents in which they were involved. **Materials and methods:** There were investigated 184 bus drivers divided into three groups: I group — 97 drivers without traffic accidents and violations of traffic rules; П group — 67 drivers with one and more traffic accidents; III group — 20 drivers without traffic accidents, but having violations of traffic rules. Control group: 48 students. Psycho-emotional stress was created on a simulator with defection of epinephrine and nor epinephrine's blood concentration by polarographic method. **Results:** Investigation has shown that work of drivers of various groups on a traffic simulator was characterized by significant changes in blood concentrations of catecholamines. So, in I group concentration of epinephrine in blood was reduced and at the same time concentration of nor epinephrine — increased. At П group concentration of epinephrine in blood increased, and concentration of nor epinephrine decreased. In III group specific changes of catecholamines are not revealed. **Conclusions:** It were revealed two types of sympato-adrenal system reaction at drivers under stressfull conditions. These types of reaction appeared closely connected with quality of professional skills and show a degree of psycho-emotional stability of the drivers in the stressful situation.

Key words:

Psycho-emotional stress, Bus drivers, Sympato-adrenal system, Catecholamines

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TIME-RELATED ASPECTS OF THE HEALTHY WORKER SURVIVOR EFFECT

KAGURU NURU

Abstract

Objectives: Health is important for continued employment and therefore continued accrual of occupational exposure; furthermore, steady employment can benefit health. Consequently, bias can occur in estimates of cumulative exposure–mortality associations. This has been called the healthy worker survivor effect (HWSE). The processes associated with the HWSE tend to lead to variation in mortality rates with time-since-termination of employment, most notably a peak in mortality shortly after termination of employment. We use simulations and an empirical example to demonstrate that time-since-termination can be a confounding factor in analyses of occupational-exposure–mortality associations. **Methods:** Simulation data were generated for 20 000 workers followed for 40 years under a model of no effect of employment duration (a proxy for cumulative exposure) on mortality. Proportional hazards regression methods were used to quantify exposure–mortality associations and evaluate methods to control for the HWSE. Results were derived after 100 iterations of the simulation. Relationships between employment duration and mortality were also investigated in a cohort of 122 247 male utility workers with adjustments for time since termination. **Results:** Simulation data show a peak in mortality rates in the first year after termination of employment which declined in magnitude with continued time since termination of employment; average employment duration also declined with time since termination of employment. This led to confounding of cumulative-exposure–mortality associations, with spurious evidence of a positive association between cumulative exposure and mortality in the post-termination period. Adjustment for time-since-termination eliminated this spurious association; in contrast, adjustment for a binary indicator of employment status led to positively-biased relative rate estimates. A similar pattern was observed in analyses of utility worker data. The log relative rate of all cancer mortality is -0.12 ± 0.03 per decade of employment without adjustment for time-since-termination, and -0.01 ± 0.03 with adjustment for time-since-termination of employment. **Conclusions:** The HWSE can lead to temporal variation in mortality rates that is correlated with cumulative exposure. Under these conditions, adjusting for time-since-termination of employment may reduce bias in estimates of cumulative-exposure–mortality trends more effectively than the commonly-used method of adjusting for a binary indicator of employment status.

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MAY NERVOUS SYSTEM DYSFUNCTIONS AND PSYCHOGENIC CAUSES EXPLAIN IDIOPATHIC ENVIRONMENTAL INTOLERANCE ATTRIBUTED TO ELECTROMAGNETIC FIELDS? A LITERATURE REVIEW

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Abstract

Some people report about complaints when being near sources of electromagnetic fields, and some of them claim to be "electromagnetic hypersensitive". This condition is also denoted idiopathic environmental intolerance attributed to electromagnetic fields (IEI-EMF). Sham controlled blind studies have failed to provide evidence for a relation between electromagnetic fields and symptoms or physiological changes. However, several studies indicate that nervous system dysfunctions, and in particular the autonomous system, may play a role. IEI-EMF individuals have demonstrated deviating base line values and/or stimuli responses of e.g. heart rate, heart rate variability, electrodermal activity and left-right difference in facial skin temperature. Furthermore, reduced sensation threshold to electric current and increased sensitivity to flickering light are demonstrated in some studies. These findings may possibly account for increased sensitivity to external and internal stimuli, thereby resulting in a higher level of complaints. Attribution of complaints to electromagnetic fields may possibly be explained by psychogenic causes. Among findings supporting this assumption are observations of nocebo effect (symptoms are provoked to the same extent by sham and EMF exposures in double blind studies); a correlation between sleep problems and fear for mobile phone base station radiation; a difference between IEI-EMF participants and controls regarding assumption about to exposure status in provocation studies (e.g. IEI-EMF subjects most often believed that they had been exposed to magnetic fields while controls most frequently believed that they had not been exposed, while both groups were equally wrong). Based on findings from scientific literature there are most likely IEI-EMF individuals that suffer from nervous system dysfunctions, which might explain the occurrence of symptoms, while psychogenic causes may explain the attribution to electromagnetic fields.

Key words:

Idiopathic environmental intolerance attributed to electromagnetic fields, Electromagnetic hypersensitivity, Electromagnetic fields, Nervous system, Psychogenic mechanisms

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THE CURRENT TRENDS IN CVD IN COUNTRIES UNDERGOING ECONOMIC TRANSITION IN CENTRAL AND EASTERN EUROPE

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Abstract

Since the beginning of 1990s, countries of Central and Eastern Europe have undertaken social and economic transition from central planning economies towards market-based societies. This process has led to substantial changes in the lives of people, new opportunities, incoming liberalization and new lifestyle. However, people in the region have also witnessed large social fragmentation, rapid growth of social inequalities and alarming crime increase. The speed of changes makes the region of Central and Eastern Europe an interesting place to study the effects of social differences on health, and cardiovascular health in particular. Although life expectancy is still lower and CVD mortality still higher than in the West, some countries are catching up quickly while life expectancy in some other countries of the region is still decreasing. The recent trends in CVD and CHD mortality and morbidity will be described in this presentation. The social inequalities in health in the region and possible impact of socioeconomic reforms on cardiovascular health will also be summarized. Finally, possible impact of current economic situation on health in the region will be discussed.

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CARDIOVASCULAR PROBLEMS IN SHIFT- AND DAY-WORKING NURSES PARTICIPATING IN THE EU NEXT STUDY

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Abstract

Objective: Comparison of the prevalence of cardiovascular diseases in nurses working shifts including the night, and nurses working during day time only. **Materials and Methods:** 77 000 nurses from 10 European countries were approached with questionnaire aimed at work conditions, family life and their potential health and psychological consequences. The present study took into consideration prevalence of cardiovascular problems diagnosed by physician according to the question in Work Ability Index questionnaire. The population was subdivided into two groups: (A) group of nurses working shifts including the night shift (n = 18 039, age: 38.14±8.90); (B) group of nurses working in the day time only (n = 10 919, age: 42.95±8.82). **Results:** Percentage of nurses with cardiovascular diseases diagnosed by the physician was lower in shift working nurses (7.68% vs. 10.93%). In first three age decades this percentage was slightly higher in group A, however, and lower in last two decades, i.e. after the age of 50. It may point to self-selection in shift working individuals. The collected material does not allow for explanation of the above findings. **Conclusions:** The results of the above cross-sectional studies did not allow for decisive conclusions concerning hypothetical relationship of cardiovascular diseases and night and shift work.

Key words:
Nurses, Night and shift work, Cardiovascular diseases

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INFRADIAN AND ULTRADIAN VARIATIONS IN THE CAROTID BODY

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Abstract

Carotid body is a paired sensory organ which detects decreases in arterial oxygen tension and, through the brain stem respiratory network, generates lung hyperventilation. The hypoxic ventilatory response is one of the strongest primarily defensive reflexes in all mammals. The chemoreflex is subject to considerable variations. In humans, it is assumed that in 1–2 out of 10 individuals the usually sharply stimulatory hypoxic ventilatory response is flat or even in the negative territory. The underlying reason for the variability is an area of limited knowledge, and it is most often explained by the enigmatic genetic predisposition. In the current presentation, I wish to briefly summarize data that could give an insight into some aspects of carotid body variability and, possibly, offer alternative explanations for it. The intracellular cascade in carotid body chemoreceptor cells, which generates sensory discharge encoding the level of hypoxic excitation being transmitted to the brain, is still elusive. However, in *in vitro* studies, we found that phospholipase C (PLC) that cleaves phosphatidylinositol 4,5-bisphosphate or PtdIns(4,5)P_2, also known as PIP2, is present in normoxic cat carotid bodies and is activated in hypoxia; the process being G-protein-dependent. Furthermore, we found a difference in PIP2-PLC activity in normoxic carotid bodies depending on the season of the year. The highest level of PIP2-PLC activity was in the months September–November, lower in December–February, and the lowest in the spring months of March–May. Hypoxia stimulated PIP2-PLC activity irrespective of the season, but the seasonal cyclings remained. PIP2 acts as an intermediate in the IP3/DAG signaling pathway, triggering cellular responses. Other studies found a striking seasonal difference in the level of cAMP in the carotid body which, incidentally, turns out to be highest when PIP2 is at its nadir. It is thus possible that an increase in cAMP-dependent protein kinase A would be responsible for seasonal modifications in PIP2-PLC. Molecular variability cannot be measured in the carotid body during the 24-hour circadian day. However, ultradian rhythmicity can be detected in the carotid body at the functional level, but the paucity of studies makes the conclusive judgment difficult. One study, performed in moderately physically active individuals, demonstrated a significant, albeit moderate, increase in the hypoxic ventilatory response at mid-day, with no other appreciable variations during the 24-hour circadian day, not even a drop in reactivity at night, although the subjects were allowed to sleep just through one sleep cycle. In conclusion, the carotid body demonstrates both infradian and ultradian cyclings in regard to the underlying mechanisms of its function. The findings show that hypoxic ventilatory variations may also have other than genetic background. The exact determinants of rhythmic changes of the carotid body and their physiological meaning are the field of very limited knowledge, and thus stimulate research interest.

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ELECTROCARDIOGRAM CHANGES IN HOT LINE WORKERS EXPOSED TO ELECTROMAGNETIC FIELDS

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Abstract

Background: Hot line workers exposed to voltage higher than 20 kV in their working environment. The voltage induced electric field and current created magnetic field or eventually called Electromagnetic Fields; EMF. EMF is responsible for many health effects. It revealed that the changes in Electrocardiogram (ECG) of human exposed to EMF at the frequency of 50 Hz. Then, the aim of this study was to identify the ECG changes in hot line workers after exposed to EMF during workday practice. **Materials and Methods:** This study was a cross sectional and quasi experimental study. Sixty-five workers aged 19–47 years participated in this study. The samples were grouped according to work period and were examined by using the certified electrocardiograph protocol. Five parameters were obtained from ECG for pre and post exposed to EMF i.e. heart rate (HR), duration of P wave, PR interval, QRS complex and QT interval. **Results:** There were some significant changes in ECG patterns, particularly the heart rate and the duration of QT interval (p-value < 0.05), while no significant changes of duration of P wave, PR interval and QRS complex found in this study. **Conclusions:** EMF might cause heart injury among hot line workers through ECG changes particularly in heart rate and QT interval. The reason for decreasing in QT might be related to the modification of calcium level. The shortening of QT interval without changing in QRS complex resulted in faster of heart rate.

Key words:
Electrocardiogram, Electromagnetic fields

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ADRENALINE VS. NORADRENALINE RESPONSE TO ACUTE STRESS IN CONSCIOUS RABBITS

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Abstract

Background: Neurally-released noradrenaline and adrenomedullary-released adrenaline exert different actions on the cardiovascular system due to their different affinity towards the various adrenergic receptors. Their relative involvement in the stress response may be highly variable depending on type of stressor and individual characteristics and can only be assessed via dosage of catecholamines in blood , with poor time resolution. In the present study a method is devised to assess the extent and time course of the hormonal (HC) and neural (NC) components of sympathetic activation from the vascular response to acute stress, in conscious rabbits. **Materials and Methods:** Six rabbits were implanted with chronic probes allowing for continuous measurement of systemic blood pressure and blood flow from facial arteries, bilaterally. The cervical sympathetic nerve was unilaterally sectioned to remove sympathetic innervation from the vascular bed of the ipsilateral facial artery. The vascular response to different acute stressors was recorded and quantified in terms of percent change of vascular conductance. **Results:** The difference of the responses recorded from the two sides allowed to disentangle the vasoconstrictor power of NC and HC and to evidence their time course in response to the different stressors. NC has a major role in the first 10–20 s after which HC may prevail, in a stressor-dependent way. Moreover, the extent of HC activation was assessed and found to be mimicked by *i.v.* adrenaline injection of 0.2–0.8 μg/kg. **Conclusions:** The present method allows to describe the differential activation of neural and hormonal sympathetic pathways, in animal models.

Key words:
Adrenaline, Noradrenaline, Sympathetic nervous system, Stress, Vascular conductance

Project: "Studio e Quantificazione Dell'attivazione Simpatica Nell'animale Vigile"; Ricerca finalizzata n.1564/27.

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THE DISTRIBUTION OF EFFORT-REWARD IMBALANCE IN A REPRESENTATIVE SAMPLE OF THE DANISH WORKFORCE

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Abstract

Objectives: Effort-reward imbalance (ERI) at work has predicted incident coronary heart disease in several prospective studies. In this study, we analyzed the distribution of ERI across job groups in a representative sample of the Danish workforce. **Materials and methods:** We analyzed data from 4977 gainfully employed Danish residents (mean age: 41 years, 48% women) from the Danish Working Environment Cohort Study. ERI was measured with 4 items on effort spent at work and 7 items on reward received. An ERI-ratio was calculated by dividing the effort scale through the reward scale, yielding a ratio with higher values expressing a higher level of imbalance between high effort and low reward. Job group was defined by means of the extended Danish version of the International Standard Classification of Occupations (ISCO) — and in some cases also based on type of industry. **Results:** The average ERI-ratio was 0.53 (standard deviation: 0.18). Job groups with a mean ERI-ratio that was at least a half standard deviation higher than the average ERI-ratio included executives in the public sector, social workers, managing clerks in the public sector, and medical secretaries. Effort was highest among executives in the public sector and lowest in municipal child-minders. Rewards were highest among physicians and dentists and lowest among mail carriers. **Conclusions:** This is the first study that showed the distribution of ERI in a representative sample of a national workforce. Job groups with high exposures to ERI might be considered for occupational interventions.

Key words:
Stress, psychological, Workload, Workplace, Risk Factors

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EXAMINING CHANGES IN THE DETERMINANTS OF JOB SATISFACTION IN CANADA BETWEEN 1994 AND 2005

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Abstract

Background: Higher job satisfaction is an important determinant of health. We sought to examine: the relative contribution of various dimensions of work on job satisfaction level; if the importance of work dimensions on overall satisfaction differs across labour force sub-groups; and if the relative importance of various work dimensions on job satisfaction changed between 1994 and 2005. **Methods:** This study utilised self-reported information from the 1994 National Population Health Survey and the 2000, 2003 and 2005 cycles of the Canadian Community Health Surveys (N = 2,405 per survey). Respondents reported on various aspects of their work environment (job satisfaction, work hours, and psychosocial dimensions of work). We examined the factors associated with level of job satisfaction adjusting for various possible confounders (e.g. age, gender, education level). Future analyses (to be completed before the conference) will examine differences in the relative contribution of work dimensions across labour force sub-groups; and changes in the relative importance of various work dimensions over time. **Results:** Although respondents with higher levels of education had better working conditions in general their levels of job satisfaction were lower than respondents with less than secondary education. Shift work, weekend work and physical exertion at work were not associated with level of job satisfaction, however all other aspects of the work environment were. **Conclusions:** An individual's appraisal of the level of job satisfaction comprises multiple dimensions of the psychosocial work environment. However, aspects of work schedule (shift work and weekend work) and physical exertion were not associated with level of job satisfaction. Future work (to be completed before the conference) will examine if the relative importance of each of these dimensions differs across labour force subgroups (e.g. age, gender, living arrangement) or if the relative importance of each of these dimensions has changed across time.

Keywords:
Job satisfaction, Psychosocial work, Canada, Determinants of health

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COGNITIVE-BEHAVIORAL PSYCHOTHERAPY IN THE SYSTEM OF ISCHEMIC HEART DISEASE TREATMENT

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Abstract

Objective: Objective of the work was to find the differences in the structure of psychological conditions of the ischemic heart disease (IHD) patients, what can be used in the programme of cognitive-behavioral psychotherapy (CBT) for any concrete patient. **Materials and method:** Investigations were carried out in two cardiological hospitals of Saint Petersburg. Total number of the patients is 100 with different clinical forms of IHD. Psychological methods, including questionnaire SCL-90-R, scales of depression, scales of asthenia condition and scales of anxiety were used. The data about different manifestations of the anxiety, asthenia and depressive conditions among patients of different age, gender, different duration of IHD were obtained. **Conclusion:** Methods of cognitive-behavioral psychotherapy are important in the IHD patient treatment for correction of their emotional conditions in the complex of therapy.

Key words:

Cognitive-behavioral psychotherapy, Ischemic heart disease treatment

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TRUCTURED COPING SKILLS TRAINING CAN REDUCE STRESS-RELATED SYMPTOMS, BUT NOT WORK STRESS

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Abstract

Objectives: We studied the effects of a short structured coping skills training on work stress and stress-related somatic and psychological symptoms. **Materials and methods:** 120 working persons from diverse occupational background participated in a 12 hours training program. 89 persons (76 women, 13 men; mean age: 41.3 years, SD = 10.1) completed the questionnaires before and after the intervention. Work stress was assessed according to the Effort-Reward Imbalance model (ERI). Stress related symptoms were measured with Cohen Perceived Stress scale (PSS10), Spielberger Trait Anxiety Inventory (STAIT), shortened Beck Depression Inventory (BDI) and Patients Health Questionnaires (PHQ15). Positive psychological indicators were WHO Well-being (WWB5), LifeSkills Scale (LSS) and overall satisfaction. **Results:** At baseline, ERI was strongly associated with perceived stress and stress related symptom scores. After the intervention work stress indicators remained unchanged, whilst all symptom scores significantly decreased and wellbeing increased. Persons with high ERI showed greater improvement, their symptom scores approaching the low ERI subgroup values. **Conclusions:** This short, well structured intervention can help individuals to cope better with overall stress and to lessen the negative health consequences of high work stress load. However organizational interventions are needed to reduce work related stress, affecting large number of employees.

Key words:
Coping, skills, Work stress, Intervention, Depression, Well being

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SHIFT WORK AND METABOLIC SYNDROME, DIABETES MELLITUS AND DISCHAEMIC HEART DISEASE

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Abstract

The westernized world is in the midst of an epidemic of type 2 diabetes and associated cardiovascular disease. There is a large amount of data pointing to an association between shift work and the prevalence of many medical conditions. Night work and rotating shift work disrupt the circadian timing system. This disruption may produce significant deleterious symptoms in some workers. A shift work exerts major influences on the physiological functions of the human body. Shift work has been associated with an increased risk of cardiovascular disease, metabolic syndrome, hypertension and might have an impact on metabolic variables, and also be a risk factor for diabetes mellitus. It may be directly responsible for increased body fatness. There is a different risk associated with different shift schedules. Some studies have reported that elevated serum triglyceride and lower concentrations of high-density lipoprotein cholesterol tend to occur more frequently in shift workers than fixed daytime workers. Insulin sensitivity is known to be lower at night than during the day. There is a strong demonstration of a circadian variation in frequency of onset of myocardial infarction, sudden cardiac death, and stroke. Shift work may have a negative effect on type 2 diabetic patients' health. All presented conditions may have an important significance on taking a decision relating employment and disability pension.

Key words:
Shift work, Medical conditions, Metabolic disturbances

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INCOME DIFFERENCES IN STROKE MORTALITY: A FOLLOW-UP STUDY OF THE SWEDISH WORKING POPULATION

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Abstract

Background: Socioeconomic inequalities in stroke have been demonstrated in a variety of settings, but only a few studies focus on income differences in stroke mortality among populations of working age. This study explored the association between income and stroke mortality, and examined whether the association between income and stroke differs for stroke subtypes, or in women versus men. **Materials and Methods:** This was a register-based cohort study of nearly 3 million working people (30–64 years in 1990) with 12-year follow-up (1991–2002) for mortality from stroke (4886 deaths). Income was measured as annual registered income from work. Analyses were adjusted for demographic, socioeconomic and work related factors. Gender-specific Cox regressions were applied. **Results:** The age-adjusted hazard ratio (95% CI) of lowest versus highest income quartile was 1.80 (1.48–2.19) for any stroke; 1.68 (1.29–2.17) for intracerebral hemorrhage (ICH); and 2.23 (1.53–3.22) for brain infarction (BI) in women, and the corresponding figures for men were 2.12 (1.92–2.34); 2.02 (1.77-2.31); 2.09 (1.77–2.46). Adjustment for all potential confounders attenuated these associations to 1.69 (1.33–2.15) for any stroke and 1.56 (1.14–2.14) for ICH in women and to 1.98 (1.74–2.24) for any stroke and 1.77 (1.44–2.19) for BI in men. In contrast, adjustment for potential confounders amplified the estimates to 2.35 (1.52–3.65) for BI in women and to 2.05 (1.73–2.44) for ICH for men. **Conclusions:** The relative risk of stroke was highest in the lowest income group, with a gradient for the intermediate groups. The relative risk of brain infarction was highest in women with lowest income, and the risk of intracerebral hemorrhage was highest in men with lowest income.

Key words:
Socioeconomic position, Income, Job control, Cohort study, Stroke, Mortality

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CHANGES IN BODY MASS INDEX IN SHIFT AND DAYTIME WORKERS OVER TIME, PRELIMINARY RESULTS FROM THE 10 YEARS FOLLOW UP OF THE MAASTRICHT COHORT STUDY

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Abstract

Objectives: The observed cardiovascular disease (CVD) risk in shift workers has frequently been attributed to a mismatch between meal times and the 24-hour rhythm of digestive enzymes or a less healthy diet of shiftworkers. For both pathways, body mass index (BMI) index can be seen as an intermediate factor. The current study aims at longitudinal addressing the impact of shiftwork on BMI. **Materials and Methods:** Data from the ongoing Maastricht Cohort Study was used. In this cohort, established in 1998 among 12 140 participants from 45 different companies, data on BMI was available at baseline, and at 1, 2, 3 and (preliminary) 10 years of follow up together with work schedule information. Mixed model analysis was used to model the longitudinal relationship between shift work and body mass index, with adjustment for age, gender and educational level. **Results:** Per year of shiftwork (including nights) the body mass index increased significantly with 0.043 kg/m^2 (95% CI: 0.002–0.083), adjusted for year of observation, age, gender, and educational level, when compared to working at daytime. **Conclusions:** After 10 years of follow up we observed a slight, but significantly elevated, increase of BMI over time in shift, as compared to daytime workers. However, when estimating the excess cardiovascular risk which can related to this increase in BMI, 20 years of shift work would be related to a relative risk 1.03 in men and 1.04 in women for developing cardiovascular diseases. This means that BMI is not a likely intermediate factor between shiftwork and CVD risk.

Key words:
Cardiovascular risk, Shift work, Body mass index, Cohort study, Work schedule tolerance

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JOB STRAIN AND WORK-FAMILY SPILLOVER ARE RISK FACTORS FOR HYPERTENSION

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Abstract

Background: Research has demonstrated the importance of interaction (spillover) between work roles and family roles in increasing risk for stress and depression. Less research has been done on physiological effects of these factors, including risk for hypertension and cardiovascular disease. This research explores the relationship between work-related psychosocial stress and spillover between work and family roles, and self-reported hypertension in a large US working population. **Materials and Methods:** Data from the National Survey of Midlife Development in the United States (MIDUS I, 1995–1996) with an overall response rate of 60.8%, were used to explore work and family factors related to hypertension. Workers aged 25–64 years (n = 2091) from the MIDUS I (1310 were male and 1641 were female) were included in the analysis. To account for the sampling design of the MIDUS I data, the direct standardization and the Taylor linearized variance estimation method in STATA 10.0 were used in computing weighted descriptive statistics and measures of associations. MIDUS I provided rich data to explore work and family factors related to self-reported hypertension, in the following areas: Work and family spillover had 4 dimensions positive and negative spillover from work to family and positive and negative spillover from family to work. Each dimension had four items that were scored on a five point Likert scale. The total scores for each dimension were dichotomized at the population mean for the analysis. Work related indicators included job stress (which was expressed for different analyses as job strain-low control and high demand; the demand control ratio; and as the separate job strain scale items skill discretion, decision authority, and demands), occupation, and hours of work per week. Demographic characteristics included age, gender, race and ethnicity, marital status, children under 18 living in the household, adult children living in the household, aging parents living in the household. Socioeconomic factors included education and annual earning. Biological and behavioral factors included diabetes and alcohol consumption. **Results:** The prevalence of self-reported hypertension was 12.8% in this sample. A strong association between negative spillover from work to family and self reported hypertension were evident (OR = 1.60; 95% CI: 1.14–2.30), with the association being stronger for women (OR = 1.84) than for men (OR = 1.50), when controlling for demographic characteristics, other types of work-family spillover, work-related factors, and socioeconomic factors. No associations were found between hypertension and the other types of work-family spillovers (positive spillover from work to family, negative spillover from family to work, positive spillover from family to work). The association between job stress and self-reported hypertension was stronger when expressed as the demand-control ratio (OR = 1.61; 95% CI: 1.06–2.44) than expressed as job strain-low control and high demand (OR = 1.29). When job stress was analyzed as the individual component of job strain, low skill discretion was a significant risk factor for hypertension for both female and male workers (OR = 2.26; 95% CI: 1.19–4.26; and OR = 2.07; 95% CI: 1.20–3.36, respectively). High demands was a strong risk factors among females (OR = 1.98; 95% CI: 1.14–3.45) but not among males (OR = 1.03). High decision authority was not significantly associated with more hypertension among females (OR = 1.48), but less hypertension among males (OR = 0.82). **Conclusions:** The study indicates that both negative spillover from work to family life and job strain (especially when measured as the job strain ratio) are significant risk factors for self-reported hypertension, when controlling for other know risk factors. Among the component items of job strain, it appears that low skill discretion in both genders and high demand among females are the most significant items. It is interesting that high decision authority appeared to be non-significantly associated with increased hypertension among females but lower hypertension among males. One of the implications of this study is that health promotion programs aimed at promoting high-level wellness may require workplace initiatives that not only address work organizational factors but also promote a synergistic fit between individuals, their workplace and their family. Future health promotion efforts that reduce negative spillover from work to family may result in more pronounced improvements in employee health and well-being than those focusing on managing family conflict alone.

Key words:
Job strain, Spill over, Work, Hypertension, Cardiovascular health

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PREDICTION AND PREVENTION OF PHYSIOLOGICAL RISK FACTORS DURING INTENSIVE EXERCISE IN A HOT ENVIRONMENT

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Abstract

Background: Physical exercise in hot environments is highly challenging for the cardiovascular system because of the concomitant physiological demands: 1) a necessity of increasing blood flow to the exercising muscles on one hand and 2) a simultaneous demand for the skin blood flow to draw the excess heat off the body on the other hand. An additional challenge is imposed by considerable dehydration and hyperthermia. This work aims to developing a predictive multiscale model for evaluation of cardiovascular and thermoregulatory risk factors during human physical work in the heat. **Materials and Methods:** Predictive multiscale model was developed to simulate physiological processes in man during exercise in the heat. The model operates with such physiological parameters as intensity and duration of exercise along with recruitment of the major muscle groups. The ambient environment is being characterized by the air temperature, humidity and air velocity. The model yields dynamic changes in the body's temperature, skin and muscle blood flow, cardiac output, as well as the rate of heat removal by evaporation, the accompanying fluid loss and some of other cardiovascular and thermoregulatory parameters necessary for the predictive evaluation of environmental dangers for the human health. **Results:** Our computer simulation of human response to exercise (workload: 300–900 W; air temperature: 30–40°C, relative humidity: 20%, air velocity: 3 m/s) showed that: a) the muscle demand is being prioritized and always met; b) skin blood flow, having a lower priority, is limited due to the heart pumping function constraint; c) hyperthermia and dehydration develop in proportion with exercise intensity. **Conclusions:** A modelling of human physiological responses to specific parameters of exercise in challenging environments can be a useful tool for the prevention of health risk factors in potentially hazardous environments.

Key words:
Modelling, Thermoregulation, Circulation, Exercise, Environment, Risk factor

PIRSES-GA-2008-230858 "Risk factors of work-related diseases, methods of evaluation and prevention" acronym REWARD.

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A SURVEY OF PSYCHOSOCIAL WORK ENVIRONMENT AND JOB BURNOUT IN CHINESE ENTERPRISE EMPLOYEES

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Abstract

Background: The epidemics of job burnout in Chinese enterprise employees is unknown. This study was to investigate the current situation of job burnout in a sample of employees, and examine its association with psychosocial work environment. **Materials and Methods:** A questionnaire survey was conducted among 1187 employees in 21 enterprises of Kunming city. The job burnout and psychosocial work environment were measured by the validated Chinese version of Copenhagen Burnout Inventory and Copenhagen Psychosocial Questionnaire, respectively. **Results:** The average score of job burnout was 30.58±8.62. Using multivariate linear regression, it was found that perceived job stress, work family conflict, and length of service were positively associated with job burnout ($p < 0.05$); whereas job reward, satisfaction, and age were negatively associated with job burnout ($p < 0.05$). **Conclusions:** It is suggested that enterprises should provide their employees with pleasant work environment, such as relaxed atmosphere and fair management; while employees should learn the skills of self-psychological adjustment to reduce their burnout at work.

Key words:
Copenhagen Burnout Inventory, Copenhagen Psychosocial Questionnaire, Chinese enterprise employees

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USEFULNESS OF LONG-TERM ELECTROCARDIOLOGICAL METHODS IN OCCUPATIONAL MEDICINE

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Abstract

Work environment can be "more or less friendly" for workers. This includesseveral factors like climate, air pollution, vibrations, noise, electro-magnetic or other fields, radiation and also psychosocial likestress or strain. All of them can influence the cardiovascular system. It is of special interest to observe the cardiovascular response to this factors during the work, to define or exclude possible dangers. It is also important to analyze them in time relations in repeated studies. For these reasons noninvasieve methods that enable long term monitoring in working environment are highly valuable. Ambulatory monitoring of the ECg and blood pressure can investigate the circadian rhythms of cardiovascular system. The assessment of autonomic nervous system activity (heart rate variability analysis) give us an insight into the important regulatory system that is responsible for example for the ventricular fibrillation threshold. Job strain can also affect the AUN activity ie. has an important influence on risk of cardiovascular episodes. Long term ECG and blood pressure monitoring can analyze wheather the work exposition to different factors like electro-magnetic fields, air pollution have positive, negative or no effect on AUN acitivity, cardiac arrhythmias, blood pressure etc.

Key words:
Cardiac rehabilitation, Telemedicine

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ABSTRACTS

POSTER PRESENTATIONS

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CARDIOCIRCULATORY AND THERMAL STRAIN OF MALE FIREFIGHTERS DURING FIRE SUPPRESSION TO EXERCISE STRESS TEST AND AEROBIC EXERCISE TESTING

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Abstract

Background: Firefighters face a highly increased risk of sudden cardiac death during fire suppression. Medical examinations and physical performance tests are used to screen endangered firefighters. The aim of this study was to determine cardiocirculatory and thermal strain during fire suppression in firefighters, and to compare it to the strain during medical and performance evaluations. **Methods:** We studied 49 young professional male firefighters during a 30 min fire operation (FO) in a large fire simulation plant. Measurements were taken immediately before, during and after FO. Measurements were compared to those during a preceeding medical examination which included an exercise stress test. **Results:** During FO maximum heart rates of 177±23/min were recorded on average, with 7 participants exceeding the age-predicted maximum. Body core temperature rose by 0.9±0.5°C ($p < 0.001$); body weight decreased by 0.6±0.2 kg ($p < 0.001$), and blood parameters changed accordingly. 16% of the participants developed asymptomatic postural hypotension. In an exercise stress test as part of the mandatory medical examination participants were limited to heart rates of 176±3.3/min. They reached 155±13/min during the annual aerobic exercise in turnout gear. During FO maximum heart rate was higher than during the stress test in 66% and higher than during the aerobic exercise in 84% of the participants. **Conclusion:** Fire suppression causes an extreme cardiocirculatory strain with high heart rates that are not sufficiently tested in medical examinations. In order to increase the yield of screening for firefighters at risk of death during fire suppression, the exercise should equal the requirements in a real emergency, i.e. be limited by exhaustion or age-predicted maximum heart rate.

Key words:
Firefighters, Cardiovascular strain, Thermal strain/heat, Medical examination

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OCCUPATIONAL AND ENVIRONMENTAL FACTORS AND MYOCARDIAL INFARCTION — EPIDEMIOLOGICAL STUDIES IN THE REGION OF ŁÓDŹ, POLAND

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Abstract

Background: The aim of the project was to determine the profile of the occupational and environmental factors in people with first myocardial infarction and to assess the association between these factors and the infarction. It seemed particularly reasonable to undertake such research in Łódź, because it was expected to explain causes of excessive mortality from cardiovascular diseases (CVD) among the inhabitants of Łódź. Death rate from CVD is higher by 33% compared to the corresponding value for the general population of Poland and shows a growing trend. Previous research and preventive projects focusing on conventional CVD risk factors fail to provide a viable explanation for the elevated CVD death rate. Therefore, in spite of their unquestionable contribution to CVD prevention, these projects could not be sufficiently effective. **Materials and Methods:** A questionnaire had been developed specifically for the purpose of this study which, based on literature data and results of our own research, took into account occupational and environmental factors that may affect circulatory function. The questionnaire consisted of two parts: Part I was concerned with the assessment of patient's clinical condition, conventional CVD risk factors, results of diagnostic procedures (ECHO, 24-h Holter ECG, exercise test, coronarography). Part II contained questions intended to collect: demographic data, such as age, gender, marital status, education, employment (current employment, current profession), current and former jobs, position, company type, work organisation (shift work, hours per day/week, overtime), work type and its characteristics, subjective assessment of work severity, chemical agents, dusts, physical agents, psychosocial factors, assessment of fatigue, assessment of work-related stress), housing conditions, income, family data, exercise (type and frequency of leisure-time exercise), dietary habits, addictions, health condition (self-assessed and based on earlier physician-diagnosed diseases), assessment of sleep quality and possible sleep disturbances, family history. The duration of the project was one year, during which all patients hospitalised for the first myocardial infarction were interviewed. **Conclusions:** The resultant data serve as a basis for analysing associations between the occupational/environmental factors and myocardial infarction.

Key words:
Cardiovascular diseases (CVD), Conventional risk factors of CVD, Work-related diseases

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NEUROVEGETATIVE DISTURBANCES IN WORKERS EXPOSED TO ELECTROMAGNETIC FIELDS

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Abstract

Background: The study was undertaken to evaluate the neurovegetative regulation of the heart in workers occupationally exposed to radiofrequency electromagnetic fields (EMF). **Materials and Methods**: The subjects were 71 workers of medium-frequency (0.738–1.503 MHz) Broadcast Stations (RF), 40 workers of radio-services (R-S) exposed to 160 MHz EMF and 42 workers of Radio Link Stations, not exposed to EMF. The results were adjusted for age, smoking habit and alcohol consumption. Heart rate variability (HRV) was analyzed basing on 512 normal heart cycles registered in resting conditions. The analysis concerned time-and frequency-domain parameters of HRV. Power spectrum in the very low (VLF), low (LF), high (HF) frequency bands and total power spectrum (TPSc) was calculated. **Results:** No statistically significant differences was found between exposed and non-exposed groups in time-domain parameters. A spectral analysis revealed that VLF and TPSc were significantly lower in RF exposed group in comparison with control group. It was also significant difference between RF and R-S in VLF and LF. LF/HF ratio was significantly lower in RF than in R-S and RLS groups. In the RF-exposed group a significant, negative correlation was found between the maximum intensity of EMF and HF power spectrum. **Conclusions:** Thus it was concluded that occupational exposure to EMF brings about impairments in the neurovegetative regulation of the cardiovascular function.

Key words:

Heart rate variability, Time-domain parameters, Frequency-domain parameters, Radiofrequency electromagnetic fields

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THE ASSOCIATION OF METAL WORKING FLUID MIST EXPOSURE ON RESPIRATORY FUNCTION IN AUTOMOTIVE PART WORKERS

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Abstract

Background: Occupational health risk for workers exposed to metalworking fluids (MWFs) in automotive factory is the effect of respiratory system. This research aimed at studying the association between metal fluids mist exposure and respiratory function in automotive part workers. **Materials and Methods:** The pulmonary function tests were performed in order to find the differences in pre-shift function between the exposed and unexposed group. Pulmonary function test also aimed to find the difference of pre-shift and post-shift functions and predicted values as well as the association between the MWFs mist concentration and cross-shift changes in FVC and FEV_1 and respiratory symptom. The participants were 97 males working in a automotive parts; consisting of 56 exposed MWFs mist workers and 41 unexposed. MWFs mist concentration was measured on the first working days of workweek. The interview questionnaires were applied to collect the respiratory symptom. The statistics analyses used for this study were Paired t-test, t-test, Spearman Correlation, Pearson Correlation and Chi-square test. **Results:** The findings revealed that the exposed groups had a greater potential for abnormal pulmonary function. There was a significance association between MWFs mist concentration in working areas and cross-shift changes in FVC ($r = 0.464$, $p < 0.005$) and FEV_1 ($r = 0.557$, $p < 0.005$) and there was significance association between MWFs mist concentration and chest tightness ($p = 0.01$). **Conclusions:** It could be concluded that the exposed group had potential abnormal pulmonary function, called restrictive defect. The cross-shift changes in FVC and FEV_1 could be good indices for early detection of acute pulmonary function because they corresponded with concentration of the MWFs mist.

Key words:
Pulmonary function, Cross-Shift Changes in FVC and FEV_1, Respiratory symptom

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AMBULATORY VERSUS OCCASIONAL BLOOD PRESSURE MEASUREMENT IN WORKERS EXPOSED TO ELECTROMAGNETIC FIELDS

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Abstract

Background: We have undertaken the study in order to evaluate the blood pressure in workers exposed to electromagnetic fields (EMF), using occasional measurement (OM), and ambulatory blood pressure monitoring (ABP). **Materials and Methods**: The examinations have been carried out in 71 workers exposed of medium frequency (0.738–1.503 MHz) Broadcast Stations (RF) and 40 workers exposed to 160 MHz (R-S). The control, non exposed group were 42 workers of Radio Link Stations (RLS). The workers had performed: medical examination with OM and ABP. ABP was performed during work and leisure time activities using Medilog ABP. The results were adjusted for age, smoking habit and alcohol consumption. **Results:** Increased blood pressure in OM was found in 20% workers from RF, in 23% from R-S and in 38% from RLS. Analysis of ABP has shown that the average value of systolic and diastolic blood pressure for exposed and non-exposed groups were within limits considered as normal. However in 5% from RF, in 20% from R-S and 11% from RLS were exceeded upper limits of normal range. The differences between groups R-S vs. RLS were statistically significant. Only in group R-S the correlation between OM and ABP methods was found. **Conclusions**:Our data indicated, that in workers exposed to 160 MHz elevated blood pressure is more frequent in comparison with workers exposed to RF and with control group. This results suggest, that the exposure to electromagnetic fields at frequency 160 MHz may cause changes in blood pressure.

Key words:

Hypertension, 24-h blood pressure monitoring, Radiofrequency electromagnetic fields

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SYSTEM FOR DIAGNOSTICS OF ATRIAL ARRHYTHMIAS

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Abstract

Background: Arrhythmias genesis can be caused by circus movement of an excitation wave in heart known as re-entry mechanism. High-resolution (HR) ECG system noninvasively detects atrial late potentials (ALP), which are markers of atrial conduction delay. The work is devoted to development and improvement of methods and means for revealing low-amplitude components of cardiosignals. These enable arrhythmia's early diagnostics as well as prevention of its heavy complications. **Materials and Methods:** Distinctive feature of proposed method of detection ALP is the transformation of recorded ECG signals to the space of eigenvectors of covariance matrix. Separation of the eigenspace to signal subspace and noise subspace is based on the analysis of eigenvalues. The subsequent reconstruction of ECG in subspace of main eigenvectors leads to signal-to-noise ratio increasing, and also to expanding a dynamic range of low-amplitude components, detected by HR ECG systems. The analysis of ideal models of ECG and real electrocardiograms was done. The comparison between modelling research and real signals research was carried out. **Results:** Principles of ALP recognition in ECG signals based on a rational choice of attributes of ALP in eigenvectors coordinate basis were developed. It makes possible automation of diagnostic process. The algorithm of low-amplitude ECG components spectral estimation using the eigenvectors of electrocardiogram's noise subspace was constructed. The HR ECG system based on the proposed methodical and algorithmic support is improved by means of using the 24-digit sigma-delta ADC. **Conclusions:** The preliminary experimental results show that offered diagnostic attributes of ALP are the integrated characteristic of electrophysiological processes in a myocardium and can be applied to the analysis of others ECG low-amplitude components.

Key words:
Arrhythmia, High-resolution electrocardiography system, Atrial late potentials, Coordinate basis of eigenvectors

PIRSES-GA-2008-230858 "Risk factors of work-related diseases, methods of evaluation and prevention" acronym REWARD.

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ATTENUATED VASCULAR ENDOTHELIAL FUNCTION ASSESSED BY PAT SCORE IS ASSOCIATED WITH CARDIOVASCULAR RISK FACTORS IN MIDDLE-AGED MUNICIPAL WORKERS

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Abstract

Background: Measurements of endothelial function may serve as tools in the risk stratification of cardiovascular diseases and care of patients. Peripheral arterial tonometry (PAT) is a novel technology which shows promise as a marker of endothelial function. **Materials and Methods:** 352 middle-aged municipal workers with various cardiovascular risk factors went through physical examination and laboratory assessment before randomized interventions in three different health promotion protocols. The results presented here are from the baseline measurements. Increase in digital pulse volume amplitude during reactive hyperemia was measured, and the index of vascular reactivity, RHI , was defined as the ratio of postdeflation pulse amplitude to the baseline pulse. Subjects were divided dicotomically based on cardiovascular risk factors, and differences of mean RHI were compared between groups. **Results:** RHI is lower in men ($p < 0.001$), smokers ($p = 0.001$), in those with BMI over 25 ($p < 0.001$) or waist circumference over 90 (women) or 100 (men) ($p = 0.013$). The difference between dyslipidemic and non-dyslipidemic groups was nearly significant ($p = 0.053$). There were no significant differences between the groups with or without hypertension or family history of cardiovascular diseases. There was a significant negative correlation between the number of individual's risk factors (seven risk factors mentioned above) and RHI ($R = -0.223$; $p < 0.001$). **Conclusions:** Declination of endothelial function is related to the number of risk factors. Smoking and overweight are important lifestyle related risk factors of endothelial dysfunction among middle-aged workers, and active prevention is important also in occupational health care already in early stages of cardiovascular risk development.

Key words:
Endothelium, Cardiovascular disease, Risk assessment

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STRESS-TEST FOR EARLY DIAGNOSTICS OF THE MYOCARDIUM DYSFUNCTION

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Abstract

Objective: It is necessary to develop and use new methods for early diagnostic of myocardium dysfunction in the groups of people, which undergo the same risk factors. **Materials and Methods:** 54 patients with stable ischemic heart disease without myocardium infarction (34 men and 20 women, average age 54.6±0.8 years) and 20 healthy people were included in study. Systolic and diastolic functions were investigated by echocardiography before and after stress-test on the treadmill with individual critical level of the load by Bruse protocol. **Results:** Parameters of systolic and diastolic heart functions in group of the patients before stress-test were found to be similar to parameters in group of the healthy peoples. After stress-test the following changes were found (in %%): fraction of ejection in patients −3.6±1.2% versus in health peoples +13.1±1.4% ($p < 0.001$), time of isovolumetric relaxation of the left ventricular in patients −22.0±2.3% versus in health peoples −6.3±3.3% ($p < 0.001$), VE\VA in patients −11.0±4.8% versus in healthy peoples −19.3±1.7% ($p < 0.001$). **Conclusion:** Stress-test with registration of myocardial functions parameters can be used for early diagnosis of the myocardium dysfunction in the groups of the people with the same risk factors.

Key words:

Ischemic heart disease, Myocardium dysfunction, Stress-test

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THE HEART RATE AND BLOOD PRESSURE VARIATIONS DUE TO METALWORKING FLUIDS EXPOSURE IN AN AUTOMOBILE MANUFACTURING PLANT

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Abstract

Objectives: There are many studies signifying the various health effects of exposure to metalworking fluids (MWF) mists in the work places. In this study, it was looked for the possibility of occurring cardiovascular effects due to exposure to MWFs. **Materials and methods:** 75 out of 300 workers working in three different machinery halls of an automobile manufacturing plant were randomly considered in this study. The exposure to the MWF mist was measured for each worker based on NIOSH5524 method. On the other hand, their heart rate and blood pressure were measured after one hour resting and the data were finally analyzed. **Results:** The mean of age and work experience of the workers we-re 27.52±2.39 years and 47.26±24.21 months respectively. The mean of exposure to MWF mists in the three halls were measured 2.18±1.3, 1.79±0.88 and 1.16±0.5 mg/m^3. Also, the averages of heart rate of the workers of these workshops were calculated 85.11±5.4, 79.96±3.71, 75.18±4.1 respectively. Statistical analysis showed a significant relation between the level of exposure to MWF mists and increasing the heart rate and diastolic blood pressure where the average of exposure to the MWF mists was about 2.1 mg/m^3 ($P < 0.05$). **Conclusion:** As the results show, there is a significant intensification in the heart rate and diastolic blood pressure among the workers who had the average MWF exposure level that is less than OSHA-PEL but more than NIOSH-REL. According to the findings of this study, cardiovascular effects can potentially be among MWF exposure adverse effects. Finally, it is suggested more studies about the cardiovascular effects of exposure to MWF mists.

Key words:
Metalworking fluids, Blood pressure, Heart rate, Cardiovascular disorders

The registration number of related project (as MSPH thesis) in Tehran University of Medical Science is 240/98 (21/01/1386) (04/10/2006).

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ECG, PHYSICAL FITNESS AND SOME CARDIOVASCULAR PROBLEMS IN SHIFT- AND DAY-WORKING FEMALE CRANE OPERATORS

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Abstract

Objective: Comparison of the prevalence of cardiovascular diseases in female crane operators working continuous shifts including the night and their counterparts working day time only. **Materials and Methods:** Cross-sectional study was performed on the population of the steel works in Kraków. The present analysis comprised two groups carefully selected and matched for age, type of work and environmental conditions. Group (A) was working in the day time only (n = 88, age: 37.1±9.9). The group (B) was performing the same work but in continuous, forward rotated, 3-shift, 4-team system with rotation after 4 consecutive shifts (n = 88, age: 37.1±9.8). The study comprised questionnaire covering all aspects of work, social and family life, health and psychological problems. The effort test according to Åstrand-Ryhming formula, medical examination by a physician and ECG were performed. **Results:** Both groups did not differ as to the body mass (A group: 64.7±12.8; B group: 65.3±13.2) with somewhat more overweighted and underweighted individuals in the shift workers (overweight and obesity: (A) 46.0%, (B) 51.7%; underweight: (A) 3.4%, (B) 9.2%). The prevalence of hypetension was similar (31.02% and 28.73%) as well as the hypertonic reaction to effort in normotensives (26.0% and 25.0%). CHD was diagnosed in 6.8% (A) and 5.7% (B). No abnormalities in ECG demonstrated 62.5% of workers in group (A) and 61.4% (B), but ECG abnormalities were significantly more frequent in young day workers (32.7% vs. 13.2%) and in older shift workers (45.5% vs. 76.5%). **Conclusions:** The prevalence of cardiovascular problems did not differ between groups. The changes in ECG and fitness point to hypothetical better initial health of shift workers faster deteriorating with advancing age and shift work experience. The cross sectional character of the study and small numbers of subjects do not allow for conclusive statement however.

Key words:
Nurses, Night and shift work, Cardiovascular diseases

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CARDIO-VASCULAR ADAPTATION TO HEAVY LOAD IN AN ANNUAL CYCLE TRAINING OF CYCLISTS

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Abstract

Objectives: the aim of the research was evaluation of cardio-vascular (C-V) adaptation to heavy competitive and training load in different speciality cyclists, in an annual training cycle. **Material and Method:** consisted of the top class cyclists: 75 road cyclists (RC) and 65 track cyclists (TC) at the age of 22–29 and sport practice of 6–12 years. Using electrocardiography, vectorcardiography and policardiography methods, one evaluated 72 electro-mechanical indices. By means of linear discrimination function method one determined the main discriminates of circulatory system mechanisms. The research was done in preparatory (PP), competitive (CP) and transitional (TP) periods of an annual training cycle. **Results:** At PP the energetic cost of work was rising as a result of increasing: peripheral vascular resistance (PVR), blood pressure, large vascular tonus (LVT) and CO_2 concentration. In RC the energetic cost of work increased because of the increase in PVR, whereas in TC as a result circulating blood volume (CBV) increase. At PP in RC one found an indirect correlation between CO and work capacity, and atrial electrical activity. At CP one observed opposite direction variables: CO, CBF, cardiac index, blood ejection time and myocardium contractility decreased appropriately whereas PVR compensatively increased. **Conclusion:** C-V adaptation reserve were expressed by hypertrophy, dilatation and the increase in LVT, but the limitation of C-V adaptation efficiency could have been connected with myocardium contractility.

Key words:
Adaptation, Circulation, Training, Cyclists

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STRESSFUL SITUATIONS AND BLOOD PRESSURE IN PUBLIC TRANSPORT DRIVERS

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Abstract

Background: The job of a bus driver is associated with a high level of stress at work, mostly due to being responsible for the safety of passengers in heavy urban traffic. Therefore, this profession is characterized by an increased risk of cardiovascular diseases, including hypertension. The clinical practice shows that an individually-adjusted hypotensive treatment allows the patient to lead a fairly normal life. However, there are no literature reports on the tolerance of occupational activity and the cardiovascular function in such patients. Our project has been focused on investigating the cardiovascular response to work-related stress in bus drivers with treated and untreated arterial hypertension vs. the drivers with normal blood pressure values. **Material and Methods:** The study group were 61 drivers aged 37–58 years, 31 normotensive and 30 hypertensive subjects: 15 subjects received systematic treatment and 15 had no hypotensive therapy. All the subjects had general medical examination, responded to a questionnaire regarding the risk factors and cardiovascular diseases, 24-h heart rate and blood pressure monitoring (ABPM). The subjects were asked to record in writing all the stressful situations at work during ABPM. Seventy-five conditions with different level of stresogenicity were identified and appropriate BP and HR values from the monitoring records were assigned. The statistical methods included analysis of variance and logistic regression model. **Results:** The results revealed that in subjects with untreated hypertension, the cardiovascular response to stressogenic conditions consisted in a higher increase in systolic BP (180/113 mm Hg) than in normotensive subjects (144/94 mm Hg) or receiving hypotensive treatment (153/101 mm Hg) ($p < 0.01$). **Conclusions:** The study indicates that an individually-adjusted hypotensive treatment allows the patient to lead a fairly normal occupational activity.

Key words: Hypertension, Hypotensive terapy, Work-related stress

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STUDYING THE ASSOCIATION BETWEEN PSYCHOSOCIAL WORK CHARACTERISTICS AND CARDIOVASCULAR MORBIDITY, A METHOLOGICAL CHALLENGE

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Abstract

Objective: Many studies have been described on the association between psychosocial work environment and cardiovascular disease (CVD). As the results of these studies have not been consistent, it remains difficult to draw firm conclusions about the causality of this relationship. The main reasons for the inconsistency in results are methodological issues concerning design, exposure measurement and risk factors, possible confounders or intermediates and effect modifiers. Combining data from custom meta-analysis and from the Maastricht Cohort Study (MCS), we will deal with some of these methodological issues, addressing the following questions: 1) What are the sources of heterogeneity in studies investigating the association between psychosocial work environment and CVD and how do they influence the results? 2) Is there an association between psychosocial work environment and CVD and what is the underlying mechanism? 3) In what way have studies dealt with (and operationalized) social economic status? 4) Untangle the concept of SES, which risk factors are part of SES? **Methods:** The MCS, established in 1998, is a unique prospective cohort study among 12 140 employees working in a broad range of companies and occupations. Data about psychosocial work characteristics was repeatedly collected during the follow up through questionnaires. Individual data about cardiovascular morbidity and mortality is present. The MCS enables us addressing the research questions. **Conclusions:** With this project new insight will be given into the association between psychosocial work environment and cardiovascular morbidity from a methodological point of view.

Keywords

Cardiovascular disease, Cohort study, Psychosocial work environment, Epidemiology

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OCCUPATIONAL STRESS IN PEOPLE WITH MYOCARDIAL INFARCTION

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Abstract

Materials and Methods During the study period of one calendar year, 1053 patients (692 men and 361 women) were hospitalised because of the first myocardial infarction at the cardiology clinics of the Medical University of Lodz.. Eight hundred sixteen people (77.4% of the hospitalised patients, including 550 men and 266 women) participated in the questionnaire survey. Questionnaire survey was used during this study. The questionnaire sheet consisted of two parts. The first part contained questions about patient's clinical condition and levels of risk factors, (e.g. levels of cholesterol, glucose, arterial blood pressure, tobacco smoking habit), while questions in part II referred to occupational duties and non-occupational activities, including queries on occupational and non-occupational (everyday life) stress. **Results:** Mean age in the study group was 59.9±10.4 years (26–85 years), 58.7±10.0 (26–84) years for men and 62.3±10.7 (32–85) years for women. The suffered cardiac event was declared to be associated with exceptional circumstances at home or at work by 40.4% people (43% women and 39.2% men). A majority of the study group (62.1%, including 76.5% women and 54.4% men) associated the infarct with stress. Men were more prone than women (39.1% vs. 16.5%) to correlate the experienced infarct with physical effort, while only 6.7% of the subjects declared both stress and physical effort as the possible cause. Work-related stress was experienced by 54.2% of the subjects; among those, 37.7% of the subjects (39% men and 35.1% women) assessed their work as moderately stressful, while 19.4% men and 10.6% women were of the opinion that their job was highly stressful. Among the study subjects, 77% could rely on their co-workers for support, and the percentage of men and women was comparable (74.3% and 76.9%, respectively). Support from the boss was declared to be available by 65.9% subjects (59.2% women and 41.9% men). Most of the study group, 54.5%, including 60% men and 38.3% women did not experience stress in their everyday live, and the people who did experience it assessed its intensity as moderate. **Conclusions:** A significant correlation between cardiac infarct and occupational stress found to occur in our study shows that it would be advisable to make stress coping methods widely popular.

Key words:
Questionnary studies, Gender differnces, Cardiovascular diseases

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EVALUATION OF THE NUTRITION LEVELS AMONG THE STUDENTS OF THE MAIN SCHOOL OF FIRE SERVICE (SGSP)

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Abstract

Objectives: National Fire Service (PSP) is an uniformed, professional and well equipped formation trained to fight with fires, natural disasters, and any other local dangers. Future officers of the PSP are trained in the Main School of Fire Service. Students of this school, besides being in great physical shape, must also be characterized by special psychophysical traits that will be necessary in their future line of work. Upkeep of good a good health status remains the main criteria for future ability to work during the planned employment period until the retirement. That is why it is so important to monitor their health status, also in between the mandatory check-ups that evaluate the ability to work, and when necessary, introduce preventive measures. In the prophylactic research, there was an alarming increase in the number of PSP officers who had been diagnosed with disorders of fat metabolism, which further leads to increased risk of lifestyle diseases. The main goal of this research was to determine risk factors for lifestyle diseases (nutrition, lifestyle, diet supplementation, etc.) among the students of SGSP. **Methodology:** The research was conducted among 167 male students of the 1st, 2nd and 3rd year of SGSP. Eating habits of the students were examined, while taking into consideration changes between each year of studies, and the nutritional status was based on their height, weight, circumference of waist and thighs. **Results:** 1) Changes in eating habits were observed in the form of additional meals among the students of 2nd and 3rd year of studies. 2) There was an increase in obese and overweight students on the 2nd and 3rd year of studies. 3) There was an increase in students of the 2nd and 3rd year who take diet supplementation. **Findings:** 1) Changes in the eating habits may lead to positive energy balance, which will result in obesity and excessive weight among the students of final years of studies. 2) Increase in use of diet supplements among the older students is connected with higher attention to self-image, and also better knowledge about such supplements as well as specific fashion for healthy lifestyle. 3) In the future it is necessary to undertake appropriate actions in order to educate the students of SGSP about the dangers of lifestyle diseases.

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EVALUATION OF THE CARDIOVASCULAR WORKLOAD OF LOADING MACHINE OPERATORS DURING FORESTRY WORK IN TURKEY

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Abstract

Various loading machines of different type and size are used in loading and stacking of the forest products in the forest depots in Turkey. Heart rate of the loading machine operators is affected by various variables such as machine and the environment. Cardiovascular measurements, including heart rate as well, is a reliable tool in the detection of workload. This study was conducted on 145 operators working in the loading and stacking of forest products in the forest depots in Western Black Sea Region of Turkey. Their mean systole value was found to be 79 mmHg, diastole value as 127 mmHg and heart rate as 77 beat/min while resting and as 93 beat/min while working. Mean cardiovascular workload value (HRR%) was calculated as 49% while working with the loading machines and, loading works were found to be classified into "medium-heavy work" group in workload classification. Old machines and operator seats the dynamic structure of which have been already deformed and which are still used in loading and stacking works should be replaced by the new ones. Important ergonomic factors such as noise and vibration and anthropometric features which are all effective on the physiological workload of the operator should be monitored regularly and, loading works should be carried out in healthier and more productive manner.

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DIFFERENCES IN MYOCARDIAL INFARCTION FREQUENCY IN RELATION TO PLACE OF HABITATION WITHIN THE ŁÓDŹ PROVINCE

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Abstract

Background: The aim of the present study was to determine environmental and occupational factors that affect the risk of myocardial infarction (MI). **Material and methods:** The study was performed by means of questionnaire survey among patients hospitalised during 12 months at the Clinics of Cardiology, the Medical University of Łódź, Poland. The study group comprised all patients after first MI diagnosed by ECG and enzymatic (CRP, fibrinogen, CK, troponin, CK-MB, CKMB (mass), ALAT, ASPAT) tests. The questionnaire contained 59 items (demographic data, education, position, professional career, job characteristics, occupational and non-occupational stress and fatigue, financial status, physical activity, alcohol intake, tobacco smoking, dietary habits, health status and family history). **Results:** The total number of the participants was 816 people (550 men, aged 58.7±10,0 years and 266 women aged 62.3±10.7 years). 453 subjects (55,5%) were the inhabitants of the region of Łódź. Significant differences in the frequency of MI were found to occur between the inhabitants of different districts of the region; and also between the inhabitants of different quarters of Łódź. Patients from the district of Łęczyca and of Radomsko were relatively (per 10 000 inhabitants) most (5.49 people) and least (0.17 people) numerous, respectively. In Łódź, the highest number of patients (6.42 people) hospitalised per 10 000 inhabitants came from the quarter of Downtown. In the remaining quarters, the corresponding numbers were lower, and the differences were insignificant (Górna — 4.94, Bałuty — 4.44, Polesie — 4.33 and Widzew — 4.21 people). **Conclusions:** The frequency of MI was shown to differ between the districts and quarters. Environmental conditions are supposed to be responsible for those differences; further research will be performed to explain this observation.

Key words:
Epidemiology, Myocardial infarction, Public health

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RETURN TO WORK AFTER MYOCARDIAL INFARCTION

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Abstract

Objectives: To evaluate occupational functioning and identify health-related determinants of the continuation of occupational activity in workers with a recent myocardial infarction. **Materials and Methods:** The project was a retrospective study concerning 183 male workers, aged 39–65 years, who had suffered a primary uncomplicated myocardial infarction approx. three years prior to the study. The study group comprised both the persons who returned to their occupational activity after the incident and those who did not. The subjects' mental health as well as quality of life, occupational functioning and work-related stress were evaluated using NHP scale, Beck Depression Inventory, STAI questionnaire by Spielberger et al., own questionnaire "My job", WAI, and Subjective Assessment of Work Characteristics Questionnaire by Dudek. **Results:** Data analysis revealed that the persons who had returned to work after myocardial infarction were characterized by a younger age, and a higher level of education, self-rated health and quality of life than the persons who did not manage to continue their occupational activity. The occupationally active individuals showed a varying degree of readaptation to work. In the maladapted group such disturbances occurred as depression, anxiety and lowered work ability. **Conclusions:** The study results indicate that in workers with a recent myocardial infarction, the current procedure for assessment of work ability, which is based solely on the evaluation of physical health, is insufficient and should be supplemented with assessment of their mental health. The employers should also undertake activities for a better adjustment of working conditions to the abilities of workers who have experienced a myocardial infarction.

Key words:
Myocardial infarction, Work ability, Return to work

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WORK-FAMILY RELATED RISK FACTORS FOR MAJOR DEPRESSION

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Abstract

Background: There are numerous theories about risk factors for depression. Identified risk factors include biological and genetic factors, environmental influences, and childhood or developmental events. This research explores the effects of work organization factors and the interactions between work role and family role on depression among the working age population in the United States (US). **Materials and Methods:** Data from the National Survey of Midlife Development in the United States (MIDUS I, 1995–1996) with an overall response rate of 60.8%, were used to explore work and family factors related to depression. Workers aged 25–64 years (n = 2091) from the MIDUS I (1310 were male and 1641 were female) were included in the analysis. To account for the complex sampling design, direct standardization and the Taylor linearized variance estimation method in STATA 10.0 were used in computing weighted descriptive statistics and measures of associations. MIDUS I defined Major Depression according to DSM III. MIDUS I also provided rich data to explore work and family factors related to depression specifically the following areas: (a) demographic characteristics (age, gender, race, marital status, children under 18 living in the household, adult children living in the household, aging parents living in the household); (b) biological (diabetes) and behavioral (alcohol consumption); (c) family and work related factors, such as spillover (negative spillover from work role to family role, positive spillover from work role to family role, negative spillover from family role to work role, positive spillover from family role to work role); (d) work related indicators: job strain defined as low control and high demand, demand and control ratio, specific components of job strain which included skill discretion, decision authority, and demands, occupations, and hours of work per week, and (e) socioeconomic factors (education and annual earning). **Results:** Negative spillover from work to family (OR = 1.66; 95% CI = 1.17–2.36), negative spillover from family to work (OR = 2.11; 95% CI = 1.47–3.03), and job strain (OR = 1.64; 95% CI = 1.08–2.48) were significantly related to depression for both gender groups of workers, when controlling for demographic characteristics, other types of work-family spillover, work related factors and socioeconomic factors. In gender-specific analyses, the effects of job strain and negative family to work spillover were stronger for males than among females, while the effect of negative work to family spillover was slightly stronger among females. In analyses which decomposed the job strain measure into its key sub-scales, both high demands and low skill discretion were associated with depression in both genders, with the associations being slightly stronger in females. Decision authority was not strongly associated with depression, but interestingly high decision authority was associated with higher depression in females, but lower depression in males. **Conclusions:** The study found that work-related factors, specifically job strain, and interaction between work role and family role are significant work factors for depression among workers in the US. Some differences were observed by gender, with a greater effect of negative work-family spillover in females. One of the implications of this study is that health promotion programs aimed at promoting high-level wellness may require workplace initiatives that should address work related factors, especially high work demands and low skill discretion (job strain) and negative spillover from work to family roles. These programs should pay special attention to female workers who may be more vulnerable negative work and family spillover.

Key words:
Job strain, Spill over, Depression, Psychosocial risk factors

Job stress and cardiovascular health project, COEH.

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CIRCADIAN CHANGES IN ECG IN AIR TRAFFIC CONTROLLERS (ATC)

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Abstract

Background: A demanding job as well as occupational stress may adversely affect the health state in air traffic controllers (ATC). The aim of this study was to determine the effect of shift work on circadian heart rate (HR) oscillations in ATC. **Materials and Methods:** A 24-hour ECG Holter monitoring was performed in 56 ATC aged 22–58 years during the day shift (n = 56), night shift (n = 32) and during the day off (n = 16). The recording was repeated in the same subjects during the days with different activity patterns. The changes in ECG record were evaluated for heart rhythm disturbances and lowering of the ST segment. During each hour of the study the average HR values were recorded. The time series was divided according to the kind of shift: day shift, night shift and the day off, but not immediately following the night shift. **Results:** The most visible difference in the HR circadian profile change, connected with the working hours of ATC was reflected by the average HR values, which were found to be the highest during night shift work and the lowest during the day off. the differences were most pronounced between 18:00 and 03:00. Heart rhythm disorders were observed in 11% and ST segment lowering in 16% of ATC, mainly in subjects above 40 years of age. **Conclusions:** Shift rotation in ATC does not result in circadian rhythm disorders, observed in three-shift workers working constantly on the move and involving HR phase shift or amplitude flattening.

Key words:
Air Traffic Controllers, Circadian rhythm, HR, Shift work

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