

S13.2

Job stress-related depression – a Swedish epidemic?

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The relation between illness and job conditions is often discussed. Access to medical diagnosis is a prerequisite for optimal treatment and prevention of job stress related disorders. Since 1997, the number of individuals on sick-leave for 3 months or more has increased dramatically in Sweden, and the costs to society have more than doubled in two years. Databases kept by the two Swedish insurance companies who together insure the majority of employed Swedes (about 3 million people) suggest that the increase is mainly due to depressive illness, which is particularly prevalent among middle management employees and school and health care personnel.

Epidemiological studies including structured diagnostic interviews with 250 individuals on sick-leave for any affective disorder confirmed that about 80 per cent fulfilled DSM-IV criteria for major depressive disorder. In about 50 per cent of the cases, no other cause for the depressive illness could be identified except job stress (particularly repeated reorganizations at the workplace, and an increased workload). The majority of the subjects also had physical symptoms, most commonly low back pain.

In 30686 instances of long-term sick-leave among health care personnel, a diagnosis of depression accounted for about 40 per cent of all cases of long-term sick-leave among doctors and registered nurses, while a diagnosis of musculoskeletal disorder was more common in assistant nurses. While the frequencies of depression and musculoskeletal disorders differed between different professions, together they accounted for about 70 per cent of all long-term sick-leave in all the professions studied, suggesting that job stress may be important in both types of conditions.

S13.3

Burnout links to corporate culture and work group climate

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Burnout is a stress related phenomenon that generally is regarded as dependent upon the coping ability of the individual. It is however a possibility that certain psychosocial working environment factors play an important role in the development of the stress syndrome.

Our study group is 68 persons with a sick-leave for at least one year with the diagnosis depression/burnout. They have answered two questionnaires – Sandberg & Lindell Organization Test, SLOT M and G – which describe their Working Group Climate, their Corporate Culture, the experienced change regarding different psychosocial environmental matters and their experienced Health status. The questionnaires were formerly analyzed by means of a multilevel Structural Equation Modelling program (AMOS) in large reference populations which defined factors on the inter-individual as well as on the between groups level. The latter indexes may be interpreted as more indicative of the impact of environmental psychosocial factors and the former of a more individual kind.

The results shows that there are great discrepancies between this study group and the reference populations – 17 out of 22 variables in SLOT G and 22 out of 24 in SLOT M show strongly significant deviations.

In SLOT M the Health status variables show the biggest deviations from the reference population but nearly as big deviations are found in a set of indexes under the heading Appreciation – Personal Resources, Pride and Appreciation. The group level indexes Shared Values and Change Past Present also deviates highly significant. Regarding the Corporate Culture 33% give a description of their organisation as being a Heavy Bureaucracy – the reference population having 15% in this category.

In SLOT G regarding Work Group Climate the Health status deviates still more than in the SLOT M. The change regarding Work group Climate and in Organisational climate from past until today is experienced as negative. Other strongly significant deviations were found in the indexes Self-Efficacy, Social Support, Codetermination, Feedback, Social Climate, and Cooperation.

The study highlights the strong correlation of perceived work group climate and organisational culture with burnout symptoms. The impact of those factors in the development of those symptoms should be measured in a study of longitudinal data.

S13.4

Pathophysiological aspects on stress related depression and ischemic heart disease

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In this lecture a theoretical framework for mental stress and depression as a risk factor for the development of ischemic heart disease is offered. This development can be described as dependent on the interaction between the following factors: 1) The presence of stressors, 2) activation of a receptor and transformation system (i.e. the central nervous system) and 3) physiological effector systems. A prerequisite for the psychological stress reaction is the existence of a central nervous system where stimuli are perceived interpreted and responded to. The interaction between neocortex and paleocortex is discussed as well as the initiation of the cerebral stress reaction.

Two physiological effector systems, related to mental stress will be discussed: the autonomic nervous system (ANS), and the limbic-hypothalamic-pituitary-adrenal (LHPA) axis.

Two archetypes of physiological stress reactions are described, the aggressive stress reaction (ASR) and the submissive stress reaction (SSR). The ASR is associated with an increased sympatho-adreno-medullary activity with release of catecholamines from sympathetic nerve endings as well as from the adrenal medulla. The myocardial activity following an increased activity in this system is an elevation in chronotropic, inotropic, dromotropic and bathmotropic functioning resulting in an increased cardiac output and an elevation of the mean arterial pressure. Catecholamines, released from the sympatho-adreno-medullary system, are deleterious to endothelial cell functioning, promoting uptake of light proteins to the intimal wall and are thereby an atherogenic mediator. The presence of increased amounts of vascular catecholamines is also of importance for the formation of thrombosis, spontaneous or in the case of plaque rupture.

The submissive stress reaction is related to an increased activity in the parasympathetic nervous system and also in the LHPA axis. The resulting physiological effects are storage of fat to central, visceral adipose tissue depots, decreased insulin sensitivity and responsiveness, decreased HDL cholesterol and increased triglycerides. This cluster of metabolic abnormalities is often referred to as "the metabolic syndrome". The behaviour associated with the physiological changes described above is often frustration/aggression, which later develops to self-destructive

behaviour and depression. Both the physiological and the psychological consequences of this reaction are important factors in the further development of atherosclerosis and will be described in the lecture.

S13.5

Prevention of work-related stress and ill health: options and obstacles

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The Swedish EU Presidency Conclusions of 23–24 March, 2001, read that “regaining full employment not only involves focusing on *more* jobs, but also on *better* jobs. Increased efforts should be made to promote a good working environment for all”.

According to WHO (2001), mental health problems and stress-related disorders are the biggest overall cause of premature death in Europe. Based on such considerations, the European Council of Ministers (15 November, 2001) concluded that “stress and depression related problems ... are of major importance ... and significant contributors to the burden of disease and the loss of quality of life within the European Union” and underlined that such problems are “common, cause human suffering and disability, increase the risk of social exclusion, increase mortality and have negative implications for national economies”.

In essence, this means an urgent need for preventive measures across societal sectors and levels, aiming at minimising unemployment, underemployment, and over-employment, promoting “the healthy job” concept, and humanising organisational restructuring.

The challenge to science of all this is to find out *what* to do, for *whom*, and *how*, and to bridge the science-policy gap.

According to the EU Framework Directive, employers have a “duty to ensure the safety and health of workers in every aspect related to the work”. The Directive’s principles of prevention include “avoiding risks”, “combating the risks at source”, and “adapting the work to the individual”. In addition, the Directive indicates the employers’ duty to develop “a coherent overall prevention policy”. The European Commission has published its Guidance* to provide a basis for such endeavours.

Based on surveillance at individual workplaces and monitoring at national and regional levels, work-related stress (and its outcomes in terms of both cardiovascular and mental morbidity) could be prevented or counteracted by job-redesign (e.g., by empowering the employees, and avoiding both over- and under-load), by improving social support, and by providing reasonable reward for the effort invested by workers, as integral parts of overall management systems. And by adjusting occupational physical, chemical and psychosocial settings to the workers’ abilities, needs and reasonable expectations – all in line with the requirements of the EU Framework Directive and Article 152 of the Treaty of Amsterdam, according to which “a high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities”.

Supporting actions should include research, but also adjustments of curricula in business schools, schools of technology, medicine and behavioural and social sciences, and in the training and retraining of labour inspectors, occupational health officers, labour union representatives, managers and supervisors. – Again, the challenge to science is to provide evidence-based guidelines for all such endeavours.

- (1) Levi, L and I: *Guidance on Work-Related Stress. Spice of Life or Kiss of Death? Luxembourg: European Commission, 2000 (ISBN 92–828–9806–7).*

S14. Functional Imaging In Schizophrenia

Chairs: W.W. Fleischhacker (A), F.A. Henn (D)

S14.1

Dynamics of working memory in schizophrenia

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Various studies have associated the working memory deficits observed in schizophrenic patients with hypofunction of prefrontal brainstructures. It is however not clear whether reduced frontal activity is the cause of reduced processing capacity, or the consequence of disengagement from working memory tasks that are simply too difficult for schizophrenic patients. Several recent studies have shown that if the task is modified in such a way that patients can perform adequately, frontal activity is either normal, or enhanced. This suggests that working memory capacity may not be impaired, but that utilization of working memory resources may be inefficient, leading to excessive demands on those resources. To examine this hypothesis, we conducted a study to assess the dynamics of working memory, i.e. the change in demands on working memory when a task becomes familiar after practise. In healthy subjects, activity in the working memory system reduces with practise, which is associated with automatization of cognitive processes. The degree to which this activity reduces may reflect the capacity to free processing resources that can subsequently be utilized for processing other information. In schizophrenic patients, automatization of stimulus processing during a working memory task was normal in behavioural terms (responses became more accurate and faster), but brain activity did not decrease in several frontal and parietal regions of the working memory system. These results are taken to reflect inadequate neurophysiological adjustment of working memory to automatization. We hypothesize that the working memory deficits in schizophrenia may be a consequence of a reduced neurophysiological benefit from automatization of cognitive processes, leading to excessive demands on working memory resources.

S14.2

Sensory information processing in schizophrenia: effect of atypical medications as monitored by fMRI

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Using a simple sensory paradigm which involves a visual input, an alternating checkerboard, and an acoustic input, drum beats, we are able to demonstrate disturbed thalamic and prefrontal function as well as changes in the dorsal visual processing stream and right acoustic cortex of never medicated first episode paranoid schizophrenic patients.

These studies demonstrate that early in the disease, without any medication exposure, sensory processing is defective. This involves a task with no performance component and one that is minimally sensitive to attention, the patients must simply look and listen, which in the circumstances they cannot avoid. This suggests that there are defects in the connections which mediate the processing of sensory information independent of medication. A group of these patients have been treated with atypical antipsychotic medications and followed for periods of up to 18 months. The atypical medications show a tendency to reverse the prefrontal deficits after just 6