Occupational Exposures and Cardiovascular Disease

YELLOW REPORT | A SYSTEMATIC REVIEW

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Executive summary

The Swedish Agency for Health Technology Assessment and Assessment of Social Services (SBU) conducted a systematic literature review of research on the association between occupational exposures and *cardiovascular disease*. In this review, we use cardiovascular disease as an umbrella term to include the more specific terms *heart disease, stroke* and *hypertension*.

A wide range of occupational exposures were investigated, including: organisational and psychosocial factors, physical work load, vibration, noise and environmental factors. Chemical and biological factors were not assessed in this review.

Background

Since 2011 SBU has had a mandate from the Swedish government to systematically assess the evidence associating occupational exposures to health issues. The objective of this review was to assess the scientific basis describing the influence of occupational exposures on cardiovascular disease.

Cardiovascular disease is the most common cause of death in Sweden; this was the cause of death for over a third of those who died in 2014, according to official statistics. The most common cardiovascular diseases are myocardial infarction, stroke and hypertension. The total societal cost of cardiovascular disease in Sweden year 2010 amounted to just over 60 billion Swedish krona (7 billion USD). For the most part, these were direct health care costs, followed by costs due to informal care and lost productivity.

Method

A systematic review was undertaken following the PRISMA statement and standard methods used by SBU adapted to an occupational context. A literature search covering years 1985 to November 2014 was conducted in international medical data bases. The review assessed almost 12 000 abstracts (including chemical and biological factors, which will be presented in a separate report). Studies that fulfilled strict inclusion criteria were assessed for relevance and quality, using pre-set protocols. Relevance and quality assessments were conducted by two experts, working in an evaluation pair. After conducting independent assessments, the two experts had to agree on a mutual relevance and quality classification. Some articles required that all experts participated in discussion and made a collective assessment. A total of 150 studies were classified as moderate or high quality. The strength of the scientific evidence was assessed with the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system.

Results

There is an association between occupational exposure and cardiovascular disease. This result is based on investigations of a large variety of work environments, mainly in Europe and North America. In most studies passing the quality criteria, researchers investigated occupational exposure and cardiovascular disease in populations consisting of both women and men with at least one year of follow up.

Conclusions

- People in the following groups more often develop heart disease over time than people who are not subjected to- the specified exposure at work:
  - Those with job strain (i.e. experience psychological demands, but lack control of their own working situation); or those who experience work as mentally stressful; or those who lack control; or those who experience effort-reward imbalance

- Those who experience low social support at work; those who experience injustice at work; or those who have insufficient opportunities for personal development; or those who experience job insecurity
- Those who work night schedules; or have long working weeks
- Those who are exposed to noise

- People in the following groups more often develop stroke over time than people who are not subjected to the specified exposure at work:
  - Those who lack control
  - Those who have shift-work
  - Those who are exposed to noise
  - Those who are exposed to ionizing radiation at work

- People in the following groups more often develop hypertension over time than people who are not subjected to the specified exposure at work:
  - Those who experience job strain (i.e. find their work demanding, but lack control from their working situation); or those who experience effort-reward imbalance
  - Those who have shift-work

- Women and men with similar occupational exposures develop cardiovascular disease to the same extent, in relative terms. During the working years, the risk for men to suffer or die acute myocardial infarction or stroke approximately doubles that for women.

- Cardiovascular disease has serious consequences for affected individuals, their families and the society. Prevention has the potential to reduce suffering for the individual and to save resources. This report presents research-based knowledge about occupational exposure and cardiovascular disease that is useful for future interventions in the workplace.

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