

Some Recent Developments and Concerns in Occupational Health

W H Phoon

INTRODUCTION

Occupational health concerns the interface between health and work and how one affects the other. There has been interest and concern about the work-health relationship for many years. Ramazzini, a professor of medicine in Italy in the eighteenth century, stressed that, when a doctor sees a patient, he should include in the list of questions that he would ask, one more, "What is your work?" If this question is not asked, one may miss the possibility that the patient's ill health may be caused by or contributed to by his work. His illness may also have an effect on his work and his work capacity.

The subject of occupational health, although relatively new compared with the other medical disciplines, has taken on increasing importance over the years in many countries, with the greater realisation of the intimate inter-relationship between health and work. However, many of the issues relating to occupational health today are quite different from those of 20 or 30 years ago, especially in developed countries. The so-called "smoke stack" industries have largely disappeared, when it was relatively easier to identify health hazards. Now, the issues are more subtle and unlikely to cause immediate ill effects⁽¹⁾. New technology and new chemicals are introduced into the work place at a rapid pace. The nature of work is changing. The shift in many countries from production to service industries and the advent of information technology in developed countries has created opportunities for completely new ways of working, eg. teleworking. The current merging of computer and communication technologies is facilitating the trend towards the virtual workplace. With such developments, organisations face new challenges to cope with their organisational structure and human issues relating to the new type of work place.

Psychosocial factors, stress and mental health

A survey in the USA found that 40% of workers reported that their jobs were "very or extremely stressful". Job stress has become a common and costly problem in the workplace. The UK Health and Safety Executive has been increasingly concerned about occupational stress because of the effects on the health of the work force and the cost to the economy. Many studies in Finland, the EU and

USA show that pressures in work life have increased, fatigue and burnout are a threat to a considerable part of the work force⁽²⁻⁵⁾.

Job stress can be defined as the harmful physical and emotional responses that occur when the requirements of the job do not match the capabilities, resources or needs of the workers. Job stress can lead to poor health and even injury. The National Institute of Occupational Safety and Health in the USA is directed by the Congress to study the psychological aspects of occupational safety and health, including stress at work. It is working in collaboration with industry and the academia to better understand the stress of modern work, the effects of stress on work safety and health, and ways to reduce stress at the workplace⁽⁶⁾. There is some evidence to suggest that stress plays an important role in some types of chronic health problems, eg. cardiovascular diseases, musculoskeletal disorders and psychological illnesses^(2,7).

Selye regarded stress as the rate of wear and tear, and this could be indicated by the level of 17-hydroxycortisol (17OHCS). The "repair and recovery" process could be determined by amounts of 17 ketosteroid sulfate conjugate (17KS-S). Balanced changes of hormones such as 17KS-S, 17OHCS, cortisol, catecholamine and insulin are seen in healthy individuals with healthy lifestyles, and disruption of the balance brings apparent reduction in 17KS-S. Research is on-going into the inter-relationships between biologically antagonistic 17KS-S and 17OHCS, focussing on 17KS-S, which represents a contact point between mind and body⁽⁸⁾. Urinary and salivary cortisol have been used to study the relationship between distress and physiological response. Salivary cortisol is a reliable index for the assessment of variation in endocrine activity as it closely reflects in time, the changes in the plasma levels of the hormone. But high cortisol levels seem indicative of poor general health and not just associated with stress⁽⁹⁾.

Various models are used in order to investigate the psychosocial conditions in a work place. The most common is the demand/control method developed by Karasak. On the basis of responses to a questionnaire, different jobs can be placed in a model where the demands of the job form one axis and the ability to control the work constitutes the other axis. High requirements and little control are

Department of
Industrial Health
Ministry of Manpower
18 Havelock Road #05-01
Singapore 059764

W H Phoon, MBBS, MSc
(Occ Med), FAMS, FFOM
Director

deemed to lead to the worst conditions. A common example is work at a production line⁽¹⁰⁾.

Chemical hazards

Chemicals still remain an area of concern. Although many chemicals can be used safely with good control measures in place, with modern technology, there are still concerns regarding some toxic chemicals. Also, more and more new chemicals are being introduced into the market every year and the exact health effects associated with their use may not be known until many years later. This is because the effects may be very subtle and there is a long latent period.

Solvents are widely used in industries for a variety of purposes. Many different chemicals are used as solvents. Workers are exposed to an inhalation hazard unless control measures are very effective. They can cause short term and long term effects. Biological tests are available for monitoring of workers exposed. These usually test for levels of metabolites excreted in the urine and comparing these levels to acceptable exposure indices⁽¹¹⁾. In the UK, a new test has been developed using exhaled breath samples⁽¹²⁾. The Finnish Institute of Occupational Health is researching into a computerised neuropsychological test on patients with solvent induced encephalopathy⁽⁴⁾.

Some workers develop hypersensitivity or allergy to certain chemicals at work. Such workers may develop asthmatic symptoms or allergic rhinitis on exposure to even small amounts of chemicals. (eg. toluene di-isocyanate in the plastic industry). In recent times, more chemicals have been identified to be allergenic⁽¹³⁻¹⁶⁾.

There has also been interest in the growing problem of latex glove allergy, especially among hospital and clinic personnel⁽¹⁷⁾.

According to the US Bureau of Labor Statistics, occupational skin diseases, both allergic and irritant, are the second most common type of occupational disease⁽¹⁸⁾.

Another important area of concern is in relation to chemicals which are "endocrine modulators" or "disrupters". These are chemicals which cause adverse effects in an organism or its progeny, consequent on changes in its endocrine function. Although the concern is more in relation to environmental pollution, it also impinges on occupational health where workers may be exposed to such chemicals in factories. Examples of such chemicals include pesticides eg. DDT, methoxychlor, and industrial chemicals like PCBs, (polychlorinated biphenyls), and phytoestrogens. These chemicals are suspected to be able to cause reproductive disorders, decreased seminal quality and cancer, eg. breast. Much study is being conducted in Europe, the US and Japan on this issue and tests are being developed⁽¹⁹⁾.

Reproductive health

There is growing interest in and an expanding body of literature about the effect of work on reproductive health⁽²⁰⁾. For example, exposure to organic solvents may contribute to reproductive disorders, including abortions and menstrual disorders⁽²¹⁾.

Musculoskeletal disorders

Musculoskeletal disorders related to work is a major area of concern in developed countries. The parts of the body affected include the upper limb, neck and back⁽²²⁾. They may be contributed to by repetitive monotonous work and poor seating. Thus, the subject of ergonomics has received much prominence.

One of the most highly publicised occupation-related musculoskeletal disorders is the carpal tunnel syndrome (CTS). In recent years, the literature relating occupational factors to the development of CTS has been extensively reviewed by many authors. Most of the reviews have concluded that work factors are one of the important causes⁽²²⁾. A unique centre for research on musculoskeletal disorders has been established in Sweden. This is because of the realisation that effective research on musculoskeletal disorders requires expertise in many different scientific disciplines⁽²⁴⁾.

Susceptibility and gene-environment interplay

Human health is determined by the interplay between genetic factors and the environment. Progress on the Human Genome project has led to an explosion of genetic information.

A large part of environmental health research has focussed on identifying the environmental causes of diseases. Future research can help in understanding the molecular and genetic basis of environmentally caused diseases. It has long been suspected that genetic factors affect susceptibility to occupational diseases, although this response is modified by many other host and environmental factors.

The fields of human genetics and epidemiology used to be independent disciplines. Genetic epidemiology research will increase the understanding on gene-environment interactions. A marker of susceptibility is an indicator of an inherent or acquired limitation of an organism's ability to respond to the challenge of exposure to a specific xenobiotic substance. The concept of biomarkers of susceptibility encompasses enzymes of activation and detoxification. An integral part of the use of biomarkers of susceptibility are ethical, social and legal issues surrounding studies of susceptibility (eg. genetic screening of workers, confidentiality etc.)⁽²⁵⁾.

CONCLUSION

The field of occupational health is expanding rapidly in response to the very significant changes taking place in the work place. New developments bring new challenges and concerns. The subject of occupational health has constantly been to address such concerns in order to protect and promote the health of workers everywhere.

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