EDITORIALS

Finding ‘new’ occupational diseases and trends in ‘old’ ones

Strategies for the reduction of risk to the health of workers, as well as the population in general, rely on the collection, analysis and interpretation of valid data to study work-related ill-health in relation to its determinants. In the developed world, through advances in occupational medicine and changing societal attitude reflected in legislation, the scourges of many occupational diseases such as those caused by asbestos, coal dust and silica have abated significantly. However, the risks of these diseases and many other categories of occupational ill-health ranging from noise-induced hearing loss to musculoskeletal and mental disorders still persist globally. It is clearly essential for all stakeholders including policy makers, occupational health professionals as well as employees, employers and the public to have reliable information on the trends in incidence of these conditions so as to intervene and achieve reductions in risk through legislation, enforcement and education [1]. In order to evaluate policy and its implementation, the results of these interventions can and should also be evaluated using corresponding reliable measurements of frequency of disease [1,2]. However, the challenges that hinder such reliable measurements should not be underestimated especially when potentially flawed, and in any case diverse, methods of data collection exist across national systems. To achieve better comparability of figures between countries, it is necessary to harmonize definitions and methods of recording of occupational diseases. However, the availability of reliable and integrated occupational health indicators to guide policymaking is hampered by societal, economic, financial and cultural differences between countries. Thus, Eurostat (the statistical office of the European Union) has curtailed publication of its previous range of occupational health statistics prompting a search for alternative approaches [2].

Another, arguably even bigger challenge, arises from the need for the early identification, or even the prediction of ‘new’ or emerging diseases arising from novel hazards, changing circumstances of occupational exposure, or evolution in modes of employment. In essence, new or emerging risks may result from completely novel physical, chemical or biological agents, from known risks associated with the introduction of changes in work conditions or from unforeseen methods of uptake of, or exposure to, previously recognized hazardous entities. In occupational health and safety, considerable effort can be invested in risk assessment in order to manage hazards and their risks. The risk assessment process can be viewed as a deductive method starting with established premises. However, for new risks, these premises are not known and consequently an inductive method might be more appropriate to discover and quantify previously unknown risks. Moreover, the existing ‘registries’ for occupational diseases are usually less suitable for the detection of ‘new’ occupational of work-related diseases, since they are aimed primarily at already known and established conditions. There is an urgent need to develop and study consistent methods that can improve the recognition, validation and sharing of information about new occupational health risks [3]. The European Agency for Safety and Health at Work has used techniques such as literature reviews, interviews and expert consultations to help identify and predict new and emerging occupational health risks [4]. Notwithstanding such laudable initiatives, direct observation through sentinel reporting or surveillance schemes accompanied by expert interpretation is vital to demonstrate early signals of these new hazards and emerging risks [1,5]. Once a suspicion of a new hazard is raised, targeted ‘case-finding’ may be warranted to generate a hypothesis for further research and appropriate and timely protection of workers’ health [6].

The ‘holy grail’ is to aim towards ‘ideal prevention’ by pre-empting hazards to health even before they become manifest as disease. While no system could ever promise zero-risk, it nevertheless behoves all concerned to learn from the past to achieve a better future. Strategies need to be further developed in order to utilize extant data to best advantage by predicting potential new hazards and taking steps to protect workers and consumers before any health damage is manifest. Thus, techniques such as Quantitative Structure Activity Relationships (QSARs) have been applied to a variety of potential toxicants ranging from carcinogens, mutagens and reprotoxic agents to skin sensitizers. QSARs advocated and developed for occupational asthmagens [7] and for nanoparticles [8] aim to effectively forecast unknown hazards from those which are known.

For the purposes of investigating trends in the incidence of work-related ill-health as well as to identify new or emerging health risks arising from work, an international consortium entitled MODERNET (Monitoring trends in Occupational Diseases and tracing new and Emerging Risks in a NETwork) was founded in 2008 [9]. MODERNET is a collaboration between academic centres investigating occupational disease and work-related ill-health incidence...
in a few EU countries (UK, Netherlands, France, Italy, Finland and the Czech Republic). After support from the European Union-funded COST (Cooperation in Science and Technology) programme was obtained for the period 2010–14, the network could start to grow involving 12 more European countries [Norway, Iceland, Ireland, Belgium, Germany, Switzerland, Spain, Croatia, Romania, FYROM (the former Yugoslav Republic of Macedonia), Albania, Malta] and one institute from Australia (Monash University, Melbourne) [10]. It is important to underline that the link among the participants’ institutions and the capacity of working together was so effective that, even after the end of the COST funding, the network continues to function through the collective work and resources of its members.

The analyses of valid data which track well-known diseases in relation to their recognized causes present problems of data capture, data quality, reliability and consistency of methodology [1], thus a MODERNET working group on quality was deemed essential conducting a range of activities from Cochrane reviews to surveying current practice [11]. This complemented the cardinal work of measuring and comparing international temporal trends in work-related disease incidence [2]. International collaboration within the MODERNET ‘trends’ working group has shown that it is possible to use data from various registries collected in diverse manners and still demonstrate in a methodologically sound way consistent and favourable trends in occupational diseases [2]. Further value is provided especially to policy makers and regulators within the EU through studies which evaluate the effect of regulation, for example showing achievement of the intended benefit in protecting workers from skin diseases caused by diminishing the exposure to hexavalent chromium compounds [12].

A shared MODERNET philosophy underlies the various aspects of searching for ‘new occupational diseases’ as well as the measurement of trends in the ‘old’ diseases. This is built on a wide ranging international partnership of reporters through vigilance and case reporting, followed by expert discussion. The sentinel surveillance approaches use methods which range from qualitative ones [13] to quantitatively determining disproportionality metrics [14] and with the prospect of further supplementation by geographic information systems [15]. Identifying the ‘risks’ is a necessary prerequisite for protecting the health of the workforce and the community by recommending substitutions of hazardous agents and implementing adaptations to processes thus maintaining health, wellbeing and productivity.

The usefulness of the work undertaken by MODERNET is a function both of its intrinsic scientific merit as well as of its dissemination and application. Therefore, besides the peer-reviewed output illustrated in this special issue of Occupational Medicine, corresponding dissemination of outputs in peer-reviewed and other media such as through the internet [8] continues to inform relevant stakeholders and to promote debate.

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References

Solvent-induced encephalopathy in the Netherlands and Finland

Long-term occupational exposure to organic solvents may result in the development of a brain disorder, known as chronic solvent-induced encephalopathy (CSE). A brief history of the process of recognition and the driving forces behind it, the resistance in the scientific and political context and how recognition aided preventive actions in Finland and the Netherlands is instructive.

It took many years before CSE was accepted and recognized as an occupational disease. In the 1970s and 1980s, there was growing awareness, especially in the Nordic countries, that there was a distinct pattern in symptoms and complaints reported by workers related to long-term solvent exposure. Evidence for chronic adverse brain effects related to occupational solvent exposure began to emerge in the early 1960s when the Finnish neuropyschologist Helena Hanninen published a paper about the psychological performance profile in occupational intoxications [1]. She proposed this ‘psycho-organic syndrome’ or ‘organic solvent syndrome’ as a new occupational disease. The body of CSE evidence increased in subsequent years and showed adverse neurological effects in workers exposed to solvents.

Various manifestations and findings in neuropsychological, neuroimaging, neurophysiological and neurological examinations endorse a central nervous aetiology. The hallmark of CSE is the cognitive dysfunction whose characterization requires neuropsychological assessment. It is one of the cornerstones in the diagnostic and differential diagnostic procedure for CSE with non-specific symptoms resembling clinical features of many non-occupational conditions. In many countries, there has been reluctance to use neuropsychological methods in occupational health. Therefore, the existence of so-called ‘painters disease’ was considered as ‘pseudo-neurotoxic disease’ by some scientists and physicians [2].

International peer support helped in the process of recognition. The World Health Organization (WHO) organized a symposium in which long-term effects of organic solvents on the central nervous system and a classification with diagnostic criteria were formulated [3]. Twelve years later, a publication in the Lancet [4] helped spread knowledge on the neurotoxic effects of chronic solvent exposure in workers to a wider clinical community. This