Work related upper limb disorders and the laboratory

The confusion over the correct nomenclature of what are known in the United Kingdom as "work-related upper limb disorders" is worldwide. A wide variety of equally inaccurate terms for whatever these disorders are has appeared over the years and in many countries the discredited term "repetitive strain injury" remains current. A recent legal case in the United Kingdom caused journalistic apoplexy when Judge Prosser opined that the term "repetitive strain injury" was unscientific, medically inaccurate, and it was time doctors got their act together and made a proper diagnosis. There are many occupational physicians who heartily echo his sentiments.

The Health and Safety Executive (the United Kingdom enforcement agency) prefers the term "work-related upper limb disorder" to distinguish it from the increasingly common upper limb disorders to which humans are prey.

So much for terminology. The problem is we do not really know what we are actually dealing with. That work-related upper limb disorders exist there is no doubt, whether they are as common as is claimed by the courts, trade unions and individuals is problematic. The literature on such conditions is littered with individual cases, poor quality statistical evidence and occasional enlightenment. A report from the Institute of Occupational Medicine in the United Kingdom in 1989 suggested that upper limb disorders without a doubt existed and that some of them were work -related, but there were other reasons for pain in the upper limb which were probably not associated with working conditions or equipment. In 1992 the British Orthopaedic Association reviewed a number of studies and came to the conclusion that many of the conditions within the blanket term WRULD were probably nothing to do with work and in fact often misdiagnosed. For instance, tenosynovitis is an uncommon inflammation of the tendons of the forearm, but it is often used as a catch-all diagnosis for any alleged "RSI".

A variety of occupations appear to be associated with an increased incidence of what are alleged to be work-related upper limb disorders and the Australian experience of the early to mid-1980s is salutory. Huge amounts of compensation were paid with remarkably little good evidence that there was a cause and effect relationship. A large increase in claims in the United Kingdom and Western Europe is now occuring and insurance companies are beginning to look very carefully at work systems whilst recognizing that the direct relationship between the alleged condition and the work situation is far from clear and in many cases not susceptible to objective analysis.

Does work-related upper limb disorder occur in laboratory workers? The literature is sparse with no direct reference to upper limb disorders in laboratory personnel. However, occupational physicians involved with laboratory workers report anecdotally a number of individuals reporting pain in the forearm and neck particularly during periods of very heavy pipette use. Problems reported range from discomfort generally in the upper limb and neck following a prolonged pipetting session to specific pain diagnosed as `tennis elbow`, several cases of De Quervain's tenosynovitis, some peritendonitis and pain which as been attributed to early fatigue. No worker has yet stopped the pipetting activity, but many have modified their use of the pipette and broken up the pipetting into shorter periods.

The force required to press the thumb plunger on a mechanical pipette has been reported as being between 800 g and 5 g. If this is repeated several hundred times during an experimental day then is quite reasonable to assume that fatigue in the flexor and extensor muscles of, particularly, the thumb and index finger of the dominant (or pipette-using) hand will occur. Much work-related upper limb pain is due to fatigue, but the point at which fatigue produces pain is difficult to access. Any muscle group will fatigue if used excessively in the same motion over a period of hours. However, that does not indicate that pathology is developing; recovery is the rule rather than the exception. Many regular pipette users find it possible to break up their pipetting into manageable periods during the working day. It is seldom an absolute requirement that several hours of pipetting are undertaken with no breaks to undertake other physical activity.

Neverthless, fatigue is a problem for those who pipette regularly. Where pipetting of several hundred or a thousand aliquots, automatic delivery systems should be considered.

Research is about to start in the United Kingdom to look retrospectively at the symptoms experienced by pipetting scientists and its results will be awaited with interest by the scientists themselves and equipment manufacturers. The use of ergonomics to design appropriate pipetting systems which reduce the load on the muscular systems used is not only good practice, but a requirement of legislation from the European Union now translated into member state law. In the United Kingdom this is the `Work Equipment Regulations 1992` and states that `every employer shall ensure that work equipment is so constructed or adapted as to be suitable for the purpose for which it is used or provided`. Other aspects of the Regulations refer to the risks to the health and safety of persons using the equipment which is clearly relevant in terms of musculoskeletal symptoms arising at work. The use of ergonomic science to redesign equipment so that it is much more suitable for the purpose for which it is intended, and protects the health and safety of the individual using the equipment, is not only a legal requirement. It should be good management and scientific practise.

The future is likely to see a significant number of compensation cases from technicians and scientists who have been affected by their work, and laboratory managers will need to look very carefully at work equipment and the design of scientific systems and experiment to protect their scientists and technicians.

Laboratories and universities are not exempt from European health and safety legislation and are required to address the hazards and assess the risks within their organizations and come to conclusions about how to provide management systems for health and safety at work. This will inevitably include looking at potential musculoskeletal damage and taking appropriate action to reduce the likelihood of problems.

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