

Sonographers And Work Related Upper Limb Disorders (WRULD)

An overview of current knowledge

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Background

When healthcare professionals develop symptoms of a musculo-skeletal disorder over a long period of time they do not always realise that it could be a work related problem. Work related upper limb disorder (WRULD) is recognised by some medical specialities but not by others, whilst some think it is all in the mind and not a real problem. Diagnosis is therefore dependent on the knowledge, expertise and interest of the individual and the doctor consulted¹. Indeed the European Community has no consensus, or standardised criteria for the diagnosis of WRULD. Acronyms vary as do definitions, but all pertain to a broad spectrum of disorders that affect nerves, tendons, muscles and spine². There is however acknowledgement that this is a large and growing problem for all sections of the work force with the costs being estimated at 0.5-2% of the gross national product across the European community³.

Scale of the problem

Anecdotal evidence suggests that UK sonographers are increasingly suffering from musculo-skeletal problems that result in, working in pain, taking sick leave, reducing working hours and stopping performing certain examinations that aggravate their symptoms⁴.

The Occupational Health Department at Birmingham Women's Hospital (BWH) has had an interest in this subject since 1998 when they commissioned a workplace assessment by an ergonomics advisor. This was instigated following the reported increasing prevalence of musculo-skeletal problems amongst sonographers and was followed in 1999 by a workplace survey of 64% of the sonographers (n=14) within the department. A physiotherapist on secondment from Birmingham University, used semi-structured interviews and observation to assess working practices. The findings of the study highlighted a number of hazardous factors, that were reported at the BMUS conference, 1999. Furniture that did not fit the anthropometric dimensions of the staff, lack of ergonomic training in posture and the poor set up of work stations, as well as infrequent rest pauses. This resulted in the provision of adjustable couches and the commissioning of ergonomic consultants to implement awareness training⁵. The general impression amongst BWH sonographers was that though useful, this advice was not sufficiently specific to be totally effective. The subject was raised at the inaugural meeting of the West Midlands Sonographers Action Group (WMSAG) where it became apparent that there were sonographers in every one of the eight trusts represented who were experiencing musculo-skeletal problems⁴. Searches of professional web sites and e-mail correspondence with interested individuals raised local awareness of the international scale of the problem.

In the USA, there is evidence that 81% of sonographers have scanned in pain for half of their careers and that 20% of those sonographers will have a career ending injury with resultant compensation claims⁶. A survey of Canadian and American sonographers (n=1621) reported pain/discomfort throughout their anatomy. However, the majority of the pain and discomfort was reported in the neck (74%), shoulder (76%), upper back (58%), upper arm (38%), forearm (31%), wrist (59%) and hand/fingers (55%). With 75% of respondents to the survey reporting painful work activities, 53% painful home activities and 30% had reduced their home and recreational activities because of pain⁷. Similar results were reported when the same survey instrument was used amongst (n=197) Australian sonographers⁸. Similar results were reported amongst sonographers in Israel and Italy, and cardiac sonographers in the USA^{9,10,11,12}.

The above information was presented at the next WMSAG meeting. The recognition of the growing numbers of sonographers working in pain or discomfort resulted in unanimous agreement that urgent action is required. This information was reported to the Society of Radiographers who commissioned a review of related work from the USA and instigated a feasibility study for further research¹³.

Risk factors

In the UK research report for the European Agency for Safety and Health Buckle and Devereux argue that, disagreement on the scientific basis of WRULD does not reduce the scope for the promotion of changes to working practice. Specifically, that there is general agreement that, "Appropriate ergonomics intervention for any single disorder is likely to help prevent other disorders. Such benefits arise because of the common biological pathways involved in some of the disorders".

These can be addressed by

- Work place risk assessment
- Health surveillance
- Employee information
- Training
- Ergonomic work stations
- Prevention of fatigue

Epidemiological evidence suggests that women are more at risk than men of upper limb musculo-skeletal work related injuries, although work place risks are generally thought to be of greater significance. The mean shorter stature, upper body muscle strength of women and the type of work undertaken contributing to this phenomenon. The evidence however may be biased as only certain groups of workers e.g. computer operatives, have sufficient numbers to ensure that upper limb disorders can be directly attributable to working practice. The risk factors for all workers regardless of job descriptions are generally agreed by the Health and Safety Executive as:^{14,15,16,17}

- Poor posture
- Hand applied force
- Direct pressure on body tissues
- Work organisation
- Workers perception of the organisation
- Changes to working practice

Work related tasks that induce awkward postures are perceived to significantly aggravate musculo-skeletal symptoms in sonographers. Specifically, shoulder abduction to maintain long reaches, sustained or repetitive twisting of the neck, trunk, wrist and sustained static forces whilst gripping and applying pressure with the probe. Factors associated with the physical stresses and upper extremity discomfort experienced by sonographers are related to and exacerbated by poor design and adjustability of the workstation. The arrangement of the individual workstation (monitor, keyboard, chair/stool, and examination couch) may be ergonomically unsuitable to promote good posture in the majority of sonographers.

Changes to working practice are therefore necessary, but postural and workstation adjustments require extra time for each examination. However, if the pressure of work schedules is such that there is a perceived lack of time then these solutions are unlikely to be adhered to. Psychosocial pressures impinge on best working practice, inducing feelings of lack of worth and value. Healthcare workers within the NHS are familiar with the lack of staff, suitable equipment and long waiting lists.

The risk to individual sonographers of musculo-skeletal pain/discomfort is therefore influenced by a number of factors, many of which can be addressed by ergonomic awareness training to optimise individual posture. This may involve standing for some examinations where the patient size and limitations in couch adjustment do not enable best posture. Also, consider using the other hand occasionally, especially when pain intercedes; though this may take some practice. Appropriate positioning of the patient and monitor to minimise shoulder/arm abduction and neck/trunk rotation with a second monitor being considered if this comprises patient satisfaction. Management of the workload must also become a priority as overworked sonographers take few breaks and fatigue exacerbates underlying problems.¹⁸

Recommendations

The following recommendations are the minimum requirements for the amelioration of musculo-skeletal problems that we have found locally to be effective 14,16,17.

- Ergonomic risk assessments in ALL departments.
- Height adjustable couches and stools in ALL departments.
- Minimise shoulder/arm abduction by moving the patient nearer to you
- Stand for difficult examinations
- Take rest breaks regularly
- Instigation of ergonomic awareness training programme.
- ALL sonographers should share their problems and report to their occupational health departments when, they are working in pain/discomfort that does not go away at the end of the working day and reduces home, recreational activities.
- If management does not agree to the above then ALL sonographers who experience pain that interferes with their capacity to work effectively should fill in incident reports with reference to work loads, (daily if necessary).

CONCLUSION

WRULD is well reported amongst a wide spectrum of workers across the European Community. Research has shown that adverse risk factors include poor posture, work organisation and the implementation of new technologies without effective ergonomic design and training. The scientific community is however, undecided as to the nomenclature of these disorders. Reporting of known WRULD is effective in the UK but trade unions and professional bodies may be slow to appreciate the changing risk factors associated with new technologies, with resultant continuing damage to the work force. Within the NHS, manual-handling training is advised for all staff, but ergonomic training is outside the remit of local trainers, risk assessors and Health and Safety representatives. Individual organisations approach local problems in different ways and until there is a national strategy this will remain so.

Sonographers are few in number compared to other healthcare professionals, indeed there is no national register and no requirement by the government to have a qualification to practice. Radiographers who work as sonographers are required by legislation to be registered with the Council for Professions Supplementary to Medicine (CPSM) to practice as radiographers but not as sonographers. Other healthcare professionals, doctors, midwives, echocardiographers, vascular technicians etc who practice as sonographers are registered with their own professional bodies who may not appreciate the problems within this small part of their work force. Reporting of WRULD within this framework will remain ineffective, as the body of evidence that is required to promote changes to working practice cannot be collected without a structured organisation to collate it.

Local anecdotal evidence suggests that promoting awareness of the ergonomic risk factors of WRULD and the implementation of changes to working practice can have immediate effects on the well being of individual sonographers. Without these changes UK sonographers, will increasingly succumb to work related upper limb disorders, with the subsequent loss to the work force, cost to the NHS trusts and to increasing patient waiting lists.

References

- 1.Helliwell PS. Diagnostic Criteria For Work-Related Upper Limb Disorders", British Journal of Rheumatology 1996; 35: 1195-1196
- 2.Davidson MJF. ABC of Work Related Disorders: LEGAL ASPECTS. British Medical Journal 1996; 313:1136-1140
- 3.Buckle P, Devereux J. Work-Related Neck And Upper Limb Musculoskeletal Disorders. Robens Centre for Health Ergonomics. European Agency of Safety and Health at Work 1999; ISBN 92-828-8174-1
- 4.West Midlands Sonographers Action Group (WMSAG). Minutes of meetings; 2001:
- 5.Vaughan RA. Workplace Evaluation of Ultrasonographers at the Birmingham Women's Hospital 1999; Abstract BMUS conference
- 6.Baker J. Testimony for Occupational Safety and Health Administration (OSHA) proposed ergonomic injury worksite rules; Personal communication
- 7.Murphy C, Russo A. An Update on Ergonomic Issues in Sonography; Employee Health and Safety Services at Healthcare Benefit Trust, School of Kinesiology, Simon Fraser University, British Columbia 2000: 1-14
- 8.Gregory V. Occupational Health and Safety Update. Report on the results of the Australian Sonography Survey on the prevalence of musculoskeletal disorders amongst Sonographers. Sound Effects 1999; December: 42-43
- 9.Magnavita N, Bevilacqua L, Mirk P, Fileni A, Castellino N. Work-related musculoskeletal complaints in sonologists. Journal of Occupational Environmental Medicine 1999; 41(11): 981-8

- 10.Schoenfeld A, Goverman J, Weiss DM, Meizner I. Transducer user syndrome: an occupational hazard of the ultrasonographer. *European Journal of Ultrasound* 1999; 10 (1): 41-5.
- 11.Vanderpool HE, Friis EA, Smith BS, Harms KL. Prevalence of carpal tunnel syndrome and other work-related musculoskeletal problems in cardiac sonographers. *Journal Occupational Medicine* 1993; 35(6): 604-10
- 12.Smith AC, Wolf JG, Xie GY, Smith MD. Musculoskeletal pain in cardiac ultrasonographers: results of a random survey. *Journal American Society of Echocardiographers* 1997; 10(4): 357-62.
- 13.Chapman-Jones D. Musculo-Skeletal Injury: is it a problem for sonographers? *Synergy* 2001; April: 14-15.
- 14.Health and Safety Executive. The Management of Health and Safety at Work Regulations (MHSAW) 1992; Risk assessments: 2.1, 2.2(a),2.2(e)
- 15.Health and Safety Executive. The Workplace Health, Safety and Welfare Regulations (WHSW) 1992; Work stations and seating: Regulation 11
- 16.Health and Safety Executive. The Provision and Use of Work Equipment Regulations (PUWE) 1992; Suitable work equipment: Regulation 5
- 17.Health and Safety Executive. Manual Handling Operations Regulations (MHO) 1992; Risk assessments: Regulation: 4 (1) (b) (i)
- 18.Habes DJ, Baron S. Health Hazard Evaluation Report, St. Peter's University Hospital, University of Medicine and Dentistry of New Jersey Piscataway, New Jersey. NIOSH report 1999; 99-0093-2749