

OCCUPATIONAL DISEASES AND INJURIES

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Summary

This chapter deals with diseases related to work, and injuries caused by work. Some diseases like cancer may or may not be due to work and so defining attribution is of great importance for prevention and perhaps for compensation. Musculoskeletal disorders and mental health and stress due to work predominate in economically advanced countries whereas accidents and a variety of occupational diseases due to inadequately controlled working conditions predominate in poor and economically developing countries

1. Musculoskeletal Disorders

1.1. Epidemiology

Musculoskeletal disorders are among the most common complaints ascribed to occupation. Attribution is however problematic mainly because musculoskeletal disorders are very common in the general population, there are very definite genetic factors at play and intrinsic factors such as advancing age are also relevant. Whereas, in most parts of the world, there has been a steady move away from hard physical work towards more sedentary work, complaints of musculoskeletal disorders – particularly of back pain – have increased. Why this should have happened is still not entirely clear, but could be related to an increased propensity to report back pain, especially if its origin is perceived to be work-induced or work-related. Work-related musculoskeletal disorders have, in the UK at least, declined somewhat in the last 10 years although again the reasons for this are not entirely clear and could be due to changes in reporting

Whatever the true cause musculoskeletal complaints in workers comprise mainly back pain (hardly surprising with, in some countries, a lifetime prevalence of 75%), leg pain often associated with back pain (about 35%) and true sciatica (referred pain in the leg due to the sciatic nerve being compressed, usually by a prolapsed intervertebral disc) only about 5%. The story is the same for upper limb pain and neck pain, which are again very common in the general population but complaints of those being due to work are less frequent. In most cases of musculoskeletal disorders, there is little relationship with work and the true cause of the pain and the pathology of the supposed injury can rarely be established –this is especially the case with back pain. Children experience back pain and in some studies, the prevalence rate up until adolescence is as high as

50%. Most complaints of work – attributed musculoskeletal pain naturally occur in working age people, although in the general population the incidence of back pain increases with age beyond retirement.

1.2. Back Pain

Some industries and occupations do report higher rates of back pain. These are construction work, health and social care and personal services. All can involve heavy and repetitive manual labour but it also has to be recognised that the effect of a painful back on someone's capacity to work is going to be greater in such physically demanding jobs, causing greater sickness absence. Non-physical workers are more able to sustain work whilst suffering moderate levels of back pain. Generally, there seem to be no gender differences.

1.3. Upper Limb Disorders

Upper limb disorders in working age people are less common than back pain but again more prevalent in certain industries and jobs such as healthcare and machine operation. There was what might be described as an epidemic of non-specific work related upper limb disorders called at the time. "Repetitive Strain Injury." or "RSI" starting in the 1980s but this has now died down. It affected largely office staff who typed on a keyboard (an innovation at the time) and was mainly confined to the fore arm although no consistent physical signs were ever apparent. It was quite different from the true repetitive strain injury experienced by factory workers who do heavy repetitive work. In these cases there are often clear physical signs of injury. The incidence of non-specific forearm pain in workers who do repetitive work varies throughout the world and, broadly speaking, is more frequently reported in economically developed countries.

1.4. Lower Limb Disorders

Lower limb disorders thought to be due to work are far less commonly reported than back and upper limb disorders and tend to be more frequently associated with musculoskeletal pain in other parts of the body. They are also more likely to be due to joint degeneration such as osteoarthritis in the hips and knees. Certain occupations such as farm workers seem to have a higher prevalence of hip arthritis,

1.5. Prevention

Despite there being a major industry devoted to preventing back injury and the ergonomic design of work activities there is little evidence that the incidence of musculoskeletal disorders is profoundly affected by these activities. This must be because of the fact that the cause of most musculoskeletal disorders is really unknown, and so it is difficult to devise preventive strategies in the face of such a common condition which is also going to be affected by the activities of everyday life – everything from sitting down to sport.

Safe systems of work will evidently reduce the frequency of accidents causing serious injuries such as fractures. It also makes sense to limit the amount of forceful repetitive

work likely to cause tendinitis and similar repetitive injuries to the wrist and shoulder in particular. Poor lifting technique, particularly in the health and social care industry where difficult loads are being manipulated can certainly result in acute back pain and shoulder injuries but whether intensive training in manual handling has a true effect in reducing the incidence of such episodes is still under investigation.

A more fruitful approach to the prevention and management of the consequences of musculoskeletal disorders – particularly back pain – is to replace the medical model (tissue damage leading to pain and loss of function needing rest and repair) with the biopsychosocial model. Obviously there are biological factors at work in back pain and sometimes there is real physical pathology. Equally important, in terms of perception of pain and recovery are psychosocial factors to the extent that in the majority of cases the dominant predictors of pain, prolonged recovery and chronic pain and disability are psychosocial rather than biological. The medical profession and musculoskeletal therapy practitioners have tended to medicalise back pain and perpetuated the tissue damage model. Not only has this resulted in a lack of efficacy of all treatment regimes, including rest and manipulation, it has diverted attention away from the true causes of disability. Again to take back pain as the best example and one for which there is plenty of evidence, it is known that most acute back pain is triggered by seemingly trivial movements, whether at work or not. The natural tendency is to regard this as an “injury” and to rest the back until the pain goes away. The medical and allied professions explain this event in terms of a “strain” or “sprain” or a “ligament pull” or even – if it is very painful – a “slipped disc” Pain is equated with damage and the damage ascribed to the originating event. A majority of such episodes last only a few days or a few weeks and clear up completely although they have a tendency to recur. The evidence now available shows that back pain is recovered from more quickly if it is regarded as a commonly experienced pain (rather like a headache) which, on the whole, is not provoked by unusually forceful physical events and does not mean that anatomical structures like muscles, ligaments, discs and vertebrae have been damaged. It would appear that prolonged rest makes the eventual outcome of an episode of back pain worse. For this reason the general public is now informed by health professionals that if they experience back pain a) it should be regarded a normal part of life b) they should take some painkillers or anti-inflammatories c) rest for as little as is necessary to get over the worst of the pain and resume life and normal activities as soon as possible. Physical treatments make very little difference to the outcome. As a result of this change in management of back pain, morbidity and disability in working populations has considerably reduced.

1.6. Clinical Features

Most musculoskeletal disorders are not serious in the sense that they usually only give rise to short lived periods of pain and disability. Sometimes, however, they are serious and need managing rather differently. Depending on the type of health care system – advanced or undeveloped, private or nationalised, musculoskeletal disorders tend to be over-investigated. In the majority of cases no investigations are needed and patients get better with very little in the way of treatment plus early mobilisation. Over-investigation in these cases contributes to patients’ feeling they have damaged themselves and they may become fixated on minor abnormalities (most people over the age of 40 have signs

of vertebral joint degeneration on x-ray), which are almost certainly not the cause of their symptoms. There is in fact very little correlation between symptoms such as pain, numbness and lack of function and appearance on magnetic resonance imaging – nevertheless, MRI scanning in simple back pain remains a common (and expensive) investigation with little in the way of evidence of cost-effectiveness.

Back pain, in a healthy person of working age, especially if it is recurrent can be treated expectantly. Investigations should only be instituted when ‘red flags’ are noted. These are warning signs that there is indeed some pathological process going on which needs to be investigated. Some examples would be a previous history of cancer, age under 16 or over 50 with new onset back pain, unexplained weight loss, and a recent serious illness. Suspicious signs might include hip or knee weakness, generalised neurological deficit, progressive spinal deformity and urinary retention. Most simple back pain is described as “mechanical” i.e. gets worse on movement. Pain, which is worse on rest is suspicious. A simple physical and neurological examination will usually give the clues to serious pathology being present. Simple blood tests, x-rays and scans may be needed to confirm the exact diagnosis. The same goes for upper limb disorders, neck disorders and lower limb disorders – a careful history and clinical examination with, usually, supplementary x-rays. It must be emphasised that these more sophisticated investigations are usually only necessary when there are “red flags”.

“Yellow flags” refer to significant psychosocial issues present in the person suffering musculoskeletal symptoms. They are associated with prolonged recovery from pain and persistent disability. For this reason they should be routinely explored and, if possible, addressed. Poor social circumstances and depression often coexist with musculoskeletal disorders. Psychosocial problems are the strongest predictors of prolonged absence from work, especially in cases of back pain and non-specific forearm pain.

Blue and black flags have also been described and are important elements in workplace health. “Blue flags” relate to the workplace: if modified work for people with musculoskeletal problems is not available or denied, then sickness absence will increase and the likelihood of back pain becoming chronic will also increase. “Black flags” relate to context and in many cases are cultural and to do with concepts of disease and illness behaviour – very different in different parts of the world.

1.7. Fitness for Work

1.7.1. Back Pain

In order to determine fitness for work it is necessary to a) define the kind of back pain, particularly the history and whether there are any red or yellow flags and b) the kind of work in question. There is no general rule, and workers or potential workers who have a history of back pain must be considered individually. A past history of recurrent simple mechanical back pain is a good predictor of further episodes of back pain, which, however, are likely to respond to expectant management as described above. Sickness absence is likely to be more of a problem but, as long as the job is not too heavy, work accommodation is often possible. It follows that people with recurrent disabling back pain should probably not enter jobs where forceful movement or awkward postures are

the norm. For individuals already at work who suffer from back pain, their management will depend upon the kind of back pain they suffer and it may be necessary to distinguish those who have common mechanical back pain from those with more serious symptoms such as sciatica originating from a prolapsed inter vertebral disc or serious disease of the spine.

1.7.2. Neck Pain

As previously mentioned, there is little relationship between the kind of work people do and their experience of neck pain – the condition is common in the general population, whatever their activities, although less common than back pain. The approach should be the same, avoiding placing workers with chronic neck pain in jobs which are going to exacerbate their symptoms and being alert to those rare cases where there is serious spinal pathology requiring investigation and treatment.

1.7.3. Upper Arm Pain

Neck pain and shoulder pain often go together, commonly due to cervical spondylosis. Specific shoulder pain in the dominant arm is probably more common in workers doing heavy repetitive work – and also sports people such as tennis players. A frozen shoulder for a period of time is not uncommon in ageing workers and in those whose arm has had to be immobilised following an injury or operation. Most of these conditions can be managed expectantly; sometimes physiotherapy helps, sometimes surgery is required.

1.7.4. Lower Arm Pain

Lower arm pain – pain in the forearm – is more likely to be non-specific than upper arm pain. Certain specific kinds of lower arm pain exist, such as tennis elbow and tendonitis at the wrist and these may require specific kinds of treatment but non-specific arm pain, particularly in non-heavy work such as repetitive typing at keyboards remains a therapeutic challenge. This is because of the uncertainty of diagnosis. In most cases there are yellow, blue and black flags present. If all these aspects are properly explored and addressed then non-specific forearm pain can be successfully managed. If not, technological fixes such as voice activated software may be the answer.

2. Mental Health and Stress

2.1. Mental Health

Mental ill-health is now the leading cause of sickness absence and long-term working incapacity in most developed countries. In those countries that provide statistics, mental ill-health is listed as the primary reason for around 35% of all disability benefits. Developing countries are catching up. This may be as a result of working life becoming more stressful or life in general more stressful or because of expectations of better mental as well as physical health or even perhaps a greater awareness and willingness to report mental health problems. Perhaps all these factors are operating. Dealing with mental health problems at work has become a major preoccupation of employers and occupational health services and indeed of health services in general. Depression has

been said by WHO to be the commonest medical condition in the world. Mental health problems are common and so it is not surprising that they crop up commonly in the workplace. Most are “common mental disorders” – a term which is not very precisely defined, but includes depression and anxiety, the milder forms of obsessive-compulsive disorder, panic disorder and phobias. They tend to be mild and self-limiting and/or amenable to simple treatment. They are to be distinguished from more serious psychiatric illness such as psychotic depression, bipolar disorders, schizophrenia, etc. Common mental disorders can have big effects on functioning at work despite the fact that they are not usually enduring. Serious psychiatric illnesses actually affect working populations less because their prevalence is lower –and many of the more serious ones preclude a normal working life.

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Bibliography

Australian Acute Musculoskeletal Pain Guidelines Group. (2003) Evidence Based Management of Acute Musculoskeletal Pain. Brisbane. Australian Academic Press [Australian guidelines]

Burton AK, Kendall NAS, Pearce BG, Birrell LN, Banbridge IC. (2008) Management of Upper Limb Disorders and the Biopsychosocial Model. London HSE Books [A bio psychosocial approach to managing upper limb disorders]

Carter JT, Birrell LN (Editors) (2000). Occupational Health Guidelines for the Management of Low Back Pain at Work. London: Faculty of Occupational Medicine [One of the first set of guidelines covering the management of low back pain at work].

European Commission, Research Directorate General (2004) Low Back Pain: Guidelines for its Management. www.backpaineurope.org [European guidelines for managing low back pain at work]

The Faculty of Occupational Medicine (2009) Upper Limb Disorders: Occupational Aspects of Management. [A UK guide to managing upper limb disorders]

Lelliott P, Boardman J, Harvey S, Henderson M, Knapp M, Tulloch S. (2008) Mental Health and Work, A Report for the National Director for Work and Health. London Royal College of Psychiatrists [UK official report]

McManus S, Meltzer H, Brugha T, Bebbington P, Jenkins R (2007) Adult Psychiatric Morbidity in England 2007, Results of a Household Survey, Leeds NHS Information for Health and Social Care [Epidemiology in UK of mental health disorders]

Managing the causes of Work Related Stress (2007): A Step by Step Approach Using the Management Standards. London HSE Books [Key reference on using the management standards approach to manage stress at work]

Henderson M, Harvey SB, Overland S, Mykletun A. (2011) Work and Common Psychiatric Disorders. *Journal of the Royal Society of Medicine*. 104, 198-207 [A guide to the impact of common psychiatric disorders on the workplace, and how to manage them]

- Nieuwenhuijsen K, Bultmann U, Neumeyer-Gromen A, Verhoeven AC, Verbeek JH, van der Felz-Cornelis CM (2008) Interventions to Improve Occupational Health in Depressed People. *Cochran Database Systematic Review* 2008 (2): CD006237 [Practical, evidence-based interventions analysis]
- Nettersterom B, Conrad N, Bech P, Think P, Allson O, Rugulies R, Stansfelt S. (2008) The Relation Between Work Related Psychosocial Factors and the Development of Depression, *Epidemiological Review*; 30: 118-132 [Scientific study of work and depression]
- Michie S, Williams S. (2003) Reducing Work Related Psychological Ill Health and Sickness Absence: A systematic Literature Review. *Occupational and Environmental Medicine.*; 60: 3-9 [Literature review of how to reduce sickness absence due to mental health disorders]
- IARC Monographs from the Evaluation of carcinogenic risks to Humans. Volumes 1-100. Lyons: International Agency for Research on Cancer 1972 - 2010. <http://monographs.iarc.fr> [Comprehensive official reports on the epidemiology of carcinogens and the risk they present to humans]
- Rushton L, Bagga S, Bevan R, Brown, TP (2010) Occupation and Cancer in Britain. *British Journal of Canof of the issue in Britain* 102: 1428-1437 [The latest review of the issue in Britain]
- Donaldson IJ, Donaldson RJ. *The Promotion of Health in Essential Public Health. Medicine* (1995) 2nd Edition Petroc Press [Health promotion in public health]
- Hawker J, Begg N, Blair I, Reintjes R, Weinberg J, Ekdahl Ket al. (2012) *Communicable Disease Control and Health Protection Handbook*, 3rd Edition. Wiley: Blackwell [UK official guidance]
- Heymann D. (2008) *Control of Communicable Diseases Manual* 19th Edition, Washington American Public Health Association [US official guidance]
- Health and Safety Executive (2008) *Common Zoonoses in Agriculture*. London HSE Books [Official guidance]
- King's Fund Briefing. (2008) *Healthcare Associated Infections: Stemming the Rise of the Superbug*. London King's Fund. Available at <http://www.kingsfund.org.uk> [A review of occupational infections of health care workers]
- Becklake MR, Bagatin E, Neder JA (2007). Asbestos Related Diseases of the Lungs and Pleura: Uses, Trends and Management over the Last century. *International Journal of Tuberculosis, Lung Disorders*; 11: 356-369 [The comprehensive review of the asbestos lung disease]
- Girard M, Cormier Y. (2010) Hypersensitivity pneumonitis, *Current Opinions Allergy Clinical Immunology*; 10: 99-103 [State-of-the-art review]
- Hendrick DJ. (2010) Recognition and Surveillance of Occupational Asthma: The Preventable Illness with Missed Opportunities. *British Medical Bulletin*; 95: 175-192 [Some of the problems of occupational asthma]
- Khan AJ, Nanchal R. (2007) Cotton Dust Lung Diseases *Current Opinions Pulmonary Medicine*; 13: 137-141 [A review of the effects of processing cotton on respiratory health]
- Ross MH, Murray J. Occupational Respiratory Disease in Mining. *Occupational Medicine* 2004; 54: 304-310 London [A review of the effects of mining on respiratory health]
- Nicholson PJ, Llewellyn D, English J (2010). *Contact Dermatitis*; 63: 77-186 [A review of contact dermatitis, particularly occupational]
- Menné T: Johansen JD, Sommerlund M, Veien K. (2011) Hand Eczema Guidelines Based on the Danish Guidelines for the Diagnosis and Treatment of Hand Eczema. *Contact Dermatitis*; 65: 3-12 [Danish guidelines on managing hand eczema]
- Rustemeyer T, Elsner P, John S-M, Maibach H I (Editors) (2012). *Kanerva's Occupational Skin Diseases*. Springer [Comprehensive textbook]
- Johansen JD, Frosch PF, Lepoittevin JP (Editors) (2010). *Contact Dermatitis* 5th Edition. Springer [Comprehensive textbook]

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