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Conditions with Specific Medical Diagnoses and Other Conditions

Thomas H*
Department of Medicine and Health Sciences, Universiti Sultan Zainal Abidin, Malaysia

Abstract

Behaviour of the worker is an additional factor in determining the modification of exposure. For example, some workers may feel more able to take short rest pauses and thus alleviate potential fatigue than do others. Similarly, highly motivated workers may exceed normal thresholds and cause damage in much the same way that people participating in active sports may injure themselves through overexertion.

Keywords: Neurons; Nerve; Innervates; Artery; Genesis; Dermatomes

Introduction

Little is known of the contribution of factors outside of work to the development of disorders of the upper limbs. Some sporting activities are commonly thought to have an association, but there is little epidemiological evidence to support these beliefs. The same is true of hobbies such as knitting. The role of soft tissue mechanisms of trauma and injury to the soft tissues of the upper limbs has been reviewed extensively elsewhere. Developments in the understanding of muscle pain and injury would seem to be particularly relevant to the non-specific disorders [1]. If the pattern of pain and resultant behaviour is to be fully understood the mechanisms by which skeletal muscle can become damaged must be seen in the context of the system as a whole rather than as discrete entities. Low level continuous contractions and static load on the musculoskeletal system may produce changes in the muscle that lead to chronic muscle pain [2]. The role of intramuscular pressure is important but has yet to be fully explained. Small amounts of shoulder abduction or flexion can cause large increases in intramuscular pressure. The occluded and impaired blood flow may lead to chronic muscle damage. Although most reports of muscle disorders seem to be of those in the shoulder and neck, other examination procedures enable reporting of muscle disorders of the wrist, and in particular the extensors [3]. Static load on nerve tissue may be critical at relatively low pressure, for example 4000-8000 Pa, pressure in the carpal tunnel with the wrist flexed and extended may approach these values.

Discussion

The recruitment patterns of motor units in specific muscles suggest that units may become overloaded even at very low levels of static loading during contractions of long duration. Changes in slow motor units in patients with chronic muscle pain have been shown. Pain may increase muscle activation, which in turn contributes to the chronicity of muscle pain in the neck and shoulder muscles. The relation between acute and chronic pain is important in understanding the course of these disorders and the relation between specific activities and the reoccurrence of pain [4]. The relation between fatigue, pain, and disorder requires further research. Cold may affect the development of upper limb disorders directly and also indirectly from the use of protective equipment. The muscles must exert greater force to overcome the restrictions of the protective clothing and as a result of difficulties in coordinating and applying the appropriate strength at the hand. The need for early intervention in the workplace is well recognised. Prevention of upper limb disorders may be facilitated by surveillance of hazardous exposures, people at risk, and early symptoms. Experience from other musculoskeletal disorders suggests that the mislabelling of patients and mismanagement at the early stage of presentation may well have an effect on the subsequent course of the disorder. On the basis of the current evidence, treatment and management must consider whether the condition might be related to work [5]. General treatment regimens have been reviewed and summarised elsewhere. Anticholinergic drugs have been used since the 19th century, when belladonna alkaloids were first given for treatment of Parkinson's disease. Their use declined because they were poorly tolerated, particularly by elderly patients. Recently, anticholinergic drugs have started to be used again for treating detrusor instability and hyper-reflexes. Oxybutynin is an anti-muscarinic used for this purpose and its efficacy and adverse effects have been described. We report four cases of cognitive dysfunction in association with oxybutynin treatment. Research suggests that acetylcholine has a role in cognition. The deficit in acetylcholine in patients who have Alzheimer's disease is due to loss of forebrain neurones that innervate the cortex. Several studies have shown reduced activity of acetylcholine transfers in the frontal cortex in Parkinson's disease. Atrophy of Meynert nucleus, which is the source of cholinergic innervation of the cortex, has been found in Alzheimer's and Parkinson's disease. Changes in muscarinic receptor density, sensitivity, and binding in the frontal cortex have also been described [6]. Oxybutynin crosses the blood-brain barrier and may cause electroencephalographic abnormalities in healthy volunteers. Muscarinic receptors are widespread in the central nervous system, especially postsynaptic M1 and M2 receptors. Oxybutynin acts primarily on M1 receptors; hence unwanted central nervous system side effects should be expected. Studies on the pharmacokinetics and clinical effects of oxybutynin in elderly patients have not described mental changes. Our cases show that this drug may precipitate acute confusion states in elderly patients with Parkinson's disease who are cognitively impaired. Caution should be used when administering this drug to elderly patients, particularly when they have cognitive impairment and are receiving multiple drug treatment [7]. Oxybutynin has a dual action in reducing detrusor motor instability and

***Corresponding author:** Thomas H, Department of Medicine and Health Sciences, Universiti Sultan Zainal Abidin, Malaysia, Tel: 01 096658236, E-mail: h.thomas@gmail.com

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hyperreflexia. Its primary action is musculotrophic acting directly on the bladder muscle as an antispasmodic agent. Its secondary action is neurotrophic acting on muscarinic receptors. The predominant stimulus to bladder contraction is parasympathetic, cholinergic-ally mediated innervation. Oxybutynin produces systemic cholinergic effects, most commonly dry mouth, blurred vision, and constipation. Though lacking specificity in outcome measures, many studies have found associations between factors within the work system and disorders of the neck and shoulder. Both physical and psychosocial work system factors show significant associations, but the strongest associations have been found with physical factors at work.26 Cumulative exposure also seems to have an effect [8]. In two studies of lateral epicondylitis, risk was six fold greater in exposed groups than controls. Exposure in the groups was defined as strenuous work requiring use of the muscle tendon structures of the upper limb. In another study, more strenuous work led to the reporting of more symptoms, but clinical examination showed a similar prevalence in groups doing strenuous and non-strenuous work. Other research, however, did not support work related aetiology. Unfortunately, none of these studies considered exposure with regard to the extensor muscles of the forearm or cumulative exposure. Though this condition is often known as tennis elbow, there are few studies of the role of tennis in such disorders. Studies of non-specific conditions tend not to have specific outcome measures [9]. Many have used symptom questionnaires, and then used symptoms of pain and discomfort at specific body sites to assess the strength of association to work related factors. Some studies have reflected on the lack of an identifiable pathological basis for these disorders coupled with the uncharacteristic pain patterns. The reported pain may arise from muscle or tendons, and psychological events may be contributing to patterns of pain reporting and subsequent chronic pain. Although some studies have considered the potential protective effect of work, 16 there is considerable evidence that carpal tunnel syndrome is strongly associated with several factors in the work system. This is consistent with the probable mechanisms leading to the syndrome namely, the stretching or compression of the median nerve at the wrist, and ischaemia. This, coupled with the increase in pressure in the carpal tunnel when the wrist is in extreme postures, helps clarify the process leading to the syndrome [10]. Current epidemiological evidence is often based on studies with weak designs. The consistency in the results, however, strongly supports a relation with factors arising from work. Here, I review evidence on selected disorders that provide insights into the associations and aetiology of this group of disorders. The diseases of person's incident to this craft arise from three cause first constant sitting, second the perpetual motion of the hand in the same manner, and thirdly the attention and application of the mind. Constant writing also considerably fatigues the hand and whole arm on account of the continual and almost tense tension of the muscles and tendons. I knew a man who, by perpetual writing, began first to complain of an excessive weariness of his whole right arm, which could be removed by no medicines, and which was at last succeeded by a perfect palsy of the whole arm. People working with flexed wrists and those working with extended wrists had odds ratios and respectively, whereas industrial workers exposed to jobs requiring high force and high repetition had an odds ratio compared with those doing light work. Others have also reported significant findings. Using hand held vibrating tools also increases the risk, as does repetition of wrist movements. Most of these studies have controlled for age and sex, where feasible. The most important work system factors are prolonged static muscle load; highly repetitive and monotonous work, high force exertions or mechanical compression of tissues, especially at the hand, use of vibrating equipment and tools; and work with many deadlines and little control Surprisingly few objective data or epidemiological studies exist on the importance of individual factors, systemic conditions, and activities outside work Management of the conditions is enhanced through early reporting or presentation and liaison in the workplace.

Conclusion

The most important work system factors are prolonged static muscle load; highly repetitive and monotonous work, high force exertions or mechanical compression of tissues, especially at the hand, use of vibrating equipment and tools; and work with many deadlines and little control Surprisingly few objective data or epidemiological studies exist on the importance of individual factors, systemic conditions, and activities outside work Management of the conditions is enhanced through early reporting or presentation and liaison in the workplace.

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Conflict of Interest

None

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