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## **Commentary on Wyatt et al. Lamb boning – an occupational cause of carpal tunnel syndrome? and Jenkins et al. Carpal tunnel syndrome: the association with occupation at a population level**

This issue of the Journal contains two studies that investigate the associations between work and carpal tunnel syndrome. This is an area of controversy and is important in the United Kingdom and other countries where employees with carpal tunnel syndrome may be eligible to compensation if a judge decides that the condition developed owing to 'unsafe' work activities.

Unfortunately, as Jenkins et al. (2012) acknowledge, this is an area of research that is very difficult to perform and is hampered by many confounding factors. These authors estimated the incidence of carpal tunnel syndrome in the nine major occupational groups and found large variation, but did not show whether this could be attributed to differing hand usage in the different occupational groups. The findings of this study do not relate to carpal tunnel syndrome itself, but to carpal tunnel syndrome referred to a Hand Clinic for consideration of surgery. This is an important distinction as it cannot be assumed that members of the nine different occupational groups were equally likely to consult their family doctor regarding symptoms of hand pain, numbness and tingling, and were equally willing to take time off work in order to attend the Hand Clinic with a view to undergoing carpal tunnel surgery. Factors such as availability of sick leave and sick pay, or medical knowledge gleaned from family, friends and web-sites, may differ between the occupational groups and influence behaviour. Nurses and doctors are more likely to be aware of the symptoms of carpal tunnel syndrome and know that the condition is readily treatable than those working in other occupations who might think these symptoms were a part of life and not amenable to treatment, so that they put up with them and do not consult their doctor. Also, job title is an inaccurate method of categorizing work duties and hand activity at work. For example, different doctors have very

different work duties, ranging from the office-based duties of a public health doctor to the hands-on fairly physical work of some surgeons. Thus, though the findings of this study are very interesting, one needs to carefully consider how they might be explained.

One strong point of the study by Wyatt et al. (2012) is that the three groups of employers in the lamb freezing works that they studied appeared to have standardized work practices. They found much higher incidences of carpal tunnel decompression surgery in boners (52-fold increase: 70/1000/year) and meat packers (23-fold increase: 31/1000/year), than in the surrounding general population of working age (1.36/1000/year). Thus, if a boning or packing work factor can 'cause' the need for carpal tunnel decompression surgery, then this factor must not be found in most of the work performed by the general population, as otherwise there would not have been such a difference between these incidences. This might suggest that most work does not 'cause' a need for carpal tunnel decompression surgery.

Are Wyatt et al. (2012) correct to state that their findings demonstrate that the boning or packing work in this factory can 'cause' carpal tunnel syndrome? Though not stated in the article, it is assumed that many boners and packers did not develop carpal tunnel syndrome, perhaps even after performing the work for many years. I estimate that 95% of boners did not undergo carpal tunnel surgery in any one year and wonder why, if the work 'causes' carpal tunnel syndrome, these 95% were spared? One explanation is that the work only resulted in the development of carpal tunnel syndrome that was sufficiently severe to warrant carpal tunnel decompression surgery in those who were constitutionally vulnerable to develop carpal tunnel syndrome. Twin studies have suggested that genetic factors may be important in the 'causation' of carpal tunnel syndrome (Hakim et al., 2002) and anthropometric measurements suggest slight differences between the structures of the wrists of carpal tunnel sufferers and controls that may indicate differences in the size of the carpal tunnel (Farmer and Davis, 2008). One could hypothesize that if one has a carpal tunnel with a large cross-sectional area,

then you might be able to work as a boner or packer without ever developing even mild carpal tunnel syndrome symptoms. In contrast, if one has a carpal tunnel with a small cross-sectional area, then this work might be very likely to provoke severe carpal tunnel symptoms that require surgical treatment. In this unproven scenario the boning and packing could be considered as a carpal tunnel stress test that detects those vulnerable to carpal tunnel syndrome owing to 'non-work' factors, just as exercising on a treadmill is used to detect the early signs of heart disease.

Wyatt et al. (2012) often observed improvement in carpal tunnel syndrome symptoms during the period of the year when the freezing works were closed. This may well suggest that the work did not cause irreversible changes to the carpal tunnel. Instead it may have caused reversible changes that aggravated a pre-existing vulnerability to carpal tunnel syndrome, such that, if the work was abandoned, the carpal tunnel syndrome symptoms would resolve. The nature of any work-induced changes in the carpal tunnel remains unknown and needs to be identified before the role of work in the pathological causation of carpal tunnel syndrome can be confidently described.

What Wyatt et al.'s data suggests is that the boning and packing work resulted in a great excess of carpal tunnel decompression surgery. But for the work, many sufferers may not have required this surgery during the remainder of their lifetime. However, one has to be cautious of concluding that the work, exclusively and on its own, 'caused' the need for carpal tunnel decompression surgery. Many diseases and conditions develop and progress because of the combined effects of multiple factors, both environmental and constitutional, and this may also be the case for carpal tunnel syndrome.

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