



Carpal Tunnel Syndrome and Food Manual Labor: Case Report and Compensation Issues

Mauro Carino^{1*}, Michele Ostuni², Daniela Martino³ and Chiara Giorgio³

¹Occupational Health Unit, National Health Service, Lungomare Starita 6, 70123 Bari, Italy.

²Department of Orthopedics, National Health Service, Lungomare Starita 6, 70123 Bari, Italy.

³Department of Rehabilitation, National Health Service, Lungomare Starita 6, 70123 Bari, Italy.

Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/BJMMR/2016/25025

Editor(s):

(1) Vijay K. Yadav, Metabolic Research Laboratory, National Institute of Immunology, Aruna Asaf Ali Marg, New Delhi, India.

Reviewers:

(1) A. K. Hakan, Bozok University, Turkey.

(2) Olubunmi Ogunrin, Internal Medicine University of Benin, Nigeria.

(3) David Castro Costa, Centro Hospitalar De Sao Joao, Porto, Portugal.

Complete Peer review History: <http://sciencedomain.org/review-history/13778>

Case Study

Received 14th February 2016

Accepted 11th March 2016

Published 21st March 2016

ABSTRACT

Aims: We report a case of bilateral carpal tunnel syndrome (CTS) in a patient who had been working with repetitive tasks for almost thirty years on his own business as pizza maker in a small restaurant. Food production outside the industry of food processing is often neglected in assessing biomechanical overload as an occupational risk for upper limb musculoskeletal disorders.

Presentation of Case: A 54-year old male reported a progressive history of pain and numbness in the thumb and first three fingers of both hands, including dysaesthesia and nocturnal waking. Main factors influencing the risk such as frequency of repetitive movement, strain, posture, pauses, complementary risk factors are described. On site mini-check list Occupational Repetitive Actions (OCRA) assessed 40/50 technical actions per minute with peak acceleration related to customers' demand and showed a middle-high risk with score 20.

Discussion and Conclusion: Criteria used for determining eligibility for compensation are not uniform and according to regulations of a single country may cover different aspects of physiological impairment, work disability, healthcare costs, loss of income and professional retraining. This case highlights the importance of using more easily applicable tools for risk assessment that can be crucial for definition and determination of causation.

*Corresponding author: E-mail: mauro.carino@asl.bari.it

Keywords: Carpal tunnel syndrome; musculoskeletal disorders; occupational risk; manual labor; food production; compensation.

ABBREVIATIONS

CTS : Carpal Tunnel Syndrome
OCRA : Occupational Repetitive Actions
ULMSD: Upper Limb Musculoskeletal Disorders

1. INTRODUCTION

The etiologic importance of occupational ergonomic stressors for the occurrence of musculoskeletal disorders of upper extremities (ULMSD) has been demonstrated and the epidemiologic literature on work-related musculoskeletal disorders in combination with extensive laboratory evidence of pathomechanisms related to work stressors is convincing [1]. Carpal tunnel syndrome (CTS) is defined by compression of the median nerve in the wrist and is regarded as an occupational health problem among manual workers in the industry. A useful body of research supports that occupations with significant wrist activities increase the risk of carpal tunnel syndrome in the manufacturing industry and in particular in food processing and food factory workers [2-6], but the occurrence in the small food labor has been rarely described) [7,8].

2. PRESENTATION OF CASE

A 54-year old right handed male reported a progressive history of pain and numbness in the thumb and first three fingers of both hands, including dysaesthesia and nocturnal waking. He had been working with repetitive tasks for almost thirty years on his own business as pizza maker in a small restaurant.

During the mixing of the ingredients and the stretching of the dough ball on a hard work surface, high strain maneuvers with forceful angular hand movements were performed with both upper limbs with repetitive 40/50 technical actions per minute and with peak acceleration related to customers' demand. The operation required high speed repetitive hand bending, pressure on the palm and wrist twisting movements.

The OCRA (Occupational Repetitive Actions) mini-checklist is a method to obtain a flexible and easy to handle risk assessment for upper limb repetitive movements [9]. It must be regarded as an alternative method to derive simplified and yet

reliable evaluation results in line with the need to create simple tools for risk assessment easily applicable also by less experienced personnel (free downloading on www.epmresearch.org). A repeated mini-checklist OCRA risk assessment showed a middle-high risk with score 20, as previously reported [10].

A profile of well-established non-occupational risk factors for nerve entrapment including individual factors such as risk-increasing leisure time activities, body mass index and predisposing co-morbidities such as arthritis, diabetes, hypothyroidism [11,12] were adequately investigated.

Physical examination showed positive Tinel and Phalen test with impaired motor function and weakened pinch/grip. Electroneuromyographic studies revealed a severe bilateral damage of the median nerve conduction. The patient underwent surgical release for both nerve entrapment with relative recovery at the nerve conduction velocity examination, but with residual paresthesia in both hands. After interrupting his manual working activity, he has been looking to receive fair workers' compensation benefits.

3. DISCUSSION

Criteria for a "quick" risk assessment and for definition of evidence-related thresholds in work sectors such as small food production that are often not reported in the literature must be considered. It must be emphasized that the importance of considering aspects such as action frequency, duration, recovery periods, as much as traditional mechanical factors such as force, load, non-neutral posture.

An elevated percentage of the small food businesses have very few employees and, according to the local legislation, are often exempt from legal obligation to provide a detailed risk assessment document.

In line with the need of new and more easily applicable tools for risk assessment and burden of proof, it was developed the Occupational Repetitive Actions mini-checklist, a method to obtain a flexible and easy to handle risk assessment for upper limb repetitive movements. Experiences in different manufacturing industry contexts have been carried out and this

instrument derives simplified and yet reliable evaluation results especially in sectors with variability in the production.

In Europe claims and compensation for these disorders have significantly increased. Trends in CTS and upper limb musculoskeletal disorders varied widely within and between European countries [13].

In Italy there is a positive trend for the number of claims of suspected work-related upper limb musculoskeletal disorders that are compensated from the National Agency for Occupational Diseases. The reporting of these diseases is mandatory for the observing physician with a legislation that contains a detailed list of diseases subject to compensation including the CTS. From 1999 to 2012 the surveillance of occupational diseases in Italy (MALPROF system) collected about 112000 cases of workers' diseases from 14 out of the 20 Italian regions. In 2010, more than 13000 cases of occupational diseases were reported. Among most frequently reported diseases there was the CTS (n = 1560, 11%) [14]. Treatment for CTS should begin early. When these workers return to work, ergonomic measures should be improved to prevent recurrence.

Defining the criteria for the association of these diseases with the occupational origin are aspects becoming increasingly important not only in relation to the growing number of recognized occupational diseases but also in relation to both economic and legal implications [15]. The main goal is to identify causal association between occupational exposure and disease and characterize the evidence that might be used to support an inference of causality "beyond a reasonable doubt". A principle underlying the philosophy of science is that causality can only be inferred with different degrees of certainty, leaving open room to differences in its assessment. Reliable contributions to help filling some gaps in the process of recognition of these diseases as work-related need to be further investigated and predisposing co-morbidities must be adequately considered by medical regulatory authority.

A key element of the medico-legal aspects is the time-related (chronological) criteria. This term includes two temporal concepts: Exposure must precede the onset of the disease and the time between start of exposure to specific risk and onset of illness must be "reasonable". This

period is commonly referred as latency time. The latency of upper limb musculoskeletal disorders is influenced by the level of exposure to risk. A latency period for CTS in the small food business activity such for pizza makers has not been suggested in the literature. Further studies are needed to assess the mean latency period of the disorder and to verify to what extent different levels of exposure influence the latency time.

4. CONCLUSION

Although automation will characterize work in the future, manual labor will remain important for Italian food products whose quality is recognized worldwide. The World Health Organization promoted the development of toolkits for different occupational risks and diseases. They are defined as a set of practical risk assessment procedures and related management guidance documents, including advice on simple risk control options. Cooperative effort to risk assessment in association with burden of proof through easily applicable tools, detailed occupational history and inspection at worksite in the case of entrapment neuropathy of the upper limbs are specific obligations which may confront the practitioner in order to allocate causation when evaluating work-relatedness of a disease.

CONSENT

A written informed consent was obtained from the patient for the publication of this case report.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist

REFERENCES

1. Punnett L, Wegman DH. Work-related musculoskeletal disorders: The epidemiologic evidence and the debate. *J Electromyogr Kinesiol.* 2004;14(1):13-23.
2. Nicoletti S, Consonni D, Carino M, et al. Upper limb work-related musculoskeletal disorders (UL- WMSDs): A retrospective cohort study in three large factories of the upholstered furniture industry. *Med Lav.* 2008;99(4):281-96.

3. Cartwright MS, Walker FO, Newman JC, et al. One-year incidence of carpal tunnel syndrome in Latino poultry processing workers and other Latino manual workers. *Am J Ind Med.* 2014;57(3):362-9.
4. Violante FS, Bonfiglioli R, Isolani L, Raffi GB. Levels of agreement of nerve conduction studies and symptoms in workers at risk of carpal tunnel syndrome. *Int Arch Occup Environ Health.* 2004;77(8):552-8.
5. Melchior M, Roquelaure Y, Evanoff B, et al. Why are manual workers at high risk of upper limb disorders? The role of physical work factors in a random sample of workers in France. *Occup Environ Med.* 2006;63(11):754-61.
6. Bonfiglioli R, Mattioli S, Spagnolo MR, Violante FS. Course of symptoms and median nerve conduction values in workers performing repetitive jobs at risk for carpal tunnel syndrome. *Occup. Med. (Lond).* 2006;56(2):115-21.
7. Vimercati L, Lorusso A, L'Abbate N, Assennato G. Bilateral carpal tunnel syndrome and ulnar neuropathy at the elbow in a pizza chef. *BMJ Case Rep;* 2009. pii: bcr11.2008.1293.
8. Leghissa P, Santini M, Bancone C, Deleidi G, Valsecchi R, Mosconi G. The bergamo experience of health surveillance in the bakery sector. *G Ital Med Lav Ergon.* 2011;33(1):12-7.
9. Colombini D, Occhipinti E. Development of simple tools for risk identification and revention of WMSDs (work related muscular-skeletal disorders): Application experience in small and craft industries. *Med Lav.* 2011;102(1):3-5.
10. Placci M, Cerbai M. Simplified models for analysis of sources of risk and biomechanical overload in craft industries: Practical application in confectioners, pasta and pizza makers. *Med Lav.* 2011;102(1):89-100.
11. Shiri R, Pourmemari MH, Falah-Hassani K, Viikari-Juntura E. The effect of excess body mass on the risk of carpal tunnel syndrome: A meta-analysis of 58 studies. *Obes Rev.* 2015;16(12):1094-104.
12. Pourmemari MH, Shiri R. Diabetes as a risk factor for carpal tunnel syndrome: A systematic review and meta-analysis. *Diabet Med.* 2016;33(1):10-6.
13. Stocks SJ, McNamee R, van der Molen HF, et al. Trends in incidence of occupational asthma, contact dermatitis, noise-induced hearing loss, carpal tunnel syndrome and upper limb musculoskeletal disorders in European countries from 2000 to 2012. *Occup Environ Med* 2015;72(4):294-303.
14. Campo G, Papale A, Baldasseroni A, et al. The surveillance of occupational diseases in Italy: The Malprof System. *Occup Med (Lond).* 2015;65(8):632-7.
15. Beach J, Chen Y, Cherry N. How physicians allocate causation: A scenario study with factorial design. *Occup Med (Lond).* 2012;62(6):407-12.

© 2016 Carino et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://sciedomain.org/review-history/13778>