



RISK OF MUSCULOSKELETAL DISORDERS AND OCCUPATIONAL DISEASES

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Abstract: *Musculoskeletal disorders and related occupational diseases are currently one of the most serious problems in production and non-production areas. Therefore, it is necessary to try to avoid such problems. This article deals with current situation of occupational diseases in Czech Republic and possibilities how to prevent health problems*

Key words: *musculoskeletal disorders, occupational diseases, ergonomics*

1. INTRODUCTION

Even if the production over several decades changed dramatically, manual labor is replaced by new technologies and machineries and workers do less physically demanded labor, they are still exposed to health risks, whose reasons are enforced and awkward working postures, frequent repetitive movements, effect of vibrafon on muscles and bones and many others.

Concurrently workers are also under increased mental strain, they often work under pressure and stress. This all contributes to origin of musculoskeletal disorders, which are frequent cause of occupational diseases. They have primarily economic and moral impact on whole society. Therefore it is important to limit and to decrease these risks and thus prevent undesirable health problems.

2. MUSCULOSKELETAL DISORDERS

In the course of manufacturing process, the worker has many harmful effects, which cause the workload on health.

Short-term largely resolves with rest or after work. Long-term harmful effects often lead to irreversible harm and they belong to the group of musculoskeletal disorders (Marek & Skřehot, 2009).

Musculoskeletal disorders (MSD's) represent group of disorders, which affect muscles, joints, tendons, ligaments, nerves and bones and currently represent a very serious problem throughout Europe (Hlávková, 2007).

Most musculoskeletal disorders have a cumulative nature of damage resulting from repeated exposure to stress, high or low intensity for a long time. MSD's result in loss of productivity, financial burden and social disadvantage, not only for workers but also employers and society as a whole. MSD's affect nearly 60 million workers in 31 European countries, represent 53% of occupational diseases and they are the leading rails of causes of sick leaves (Valečková, 2010).

3. OCCUPATIONAL DISEASES

In the Czech Republic the occupational diseases are under § 1 paragraph 1 Government Regulation No. 290/1995 Coll., diseases emerging under unfavorable influence of chemical, physical, biological or another harmful effects, if they are created under the conditions specified in the List of occupational diseases.

Diseases from this List are divided into six areas:

- Occupational diseases caused by chemical substances

- Occupational diseases caused by physical factors
- Occupational diseases of the lung, pleura and peritoneum
- Skin diseases
- Infectious and parasitic occupational diseases
- Occupational diseases caused by other factors (Fenclová et al., 2010).

Most widespread group in the Czech Republic are occupational diseases caused by physical factors. These diseases are caused already mentioned musculoskeletal disorders.

Next table presents occupational diseases in the Czech Republic, which affect musculoskeletal system.

Occupational disease	Conditions of origin
1 Diseases of blood vessels in hands while working with vibrating tools and machines.	Items 1 -3: Diseases developing during work with hand-operated pneumatic tools with such values of accelerated vibrations which, according to current level of medical knowledge, are the cause of disease.
2 Diseases of peripheral nerves of upper limbs of ischemic and isthmal neuropathies while working with vibrating tools and machines.	
3 Diseases of bones and joints of hands or wrists or elbows while working with vibrating tools and machines.	
4 Diseases of tendons, tendon sheaths, insertions, muscles or limb joints caused by long-term excessive one-sided overtaxing.	Items 4 – 5: Diseases develop during work when the respective muscle groups or nerves are being overtaxed to the extent that the overtaxing or pressure, tension or torsion are, according to current medical knowledge, the cause of the disease.
5 Diseases of tendons, tendon sheaths, insertions, muscles or limb joints caused by long-term excessive one-sided overtaxing..	
6 Bursopathy caused by pressure.	Disease develops during work performed in such a working position in which the afflicted area is under pressure for the majority of the working shift.
7 Meniscus damage.	Disease develops during work performed in kneeling or squatting position for the majority of the working shift.

Tab. 1. Occupational diseases affecting musculoskeletal system

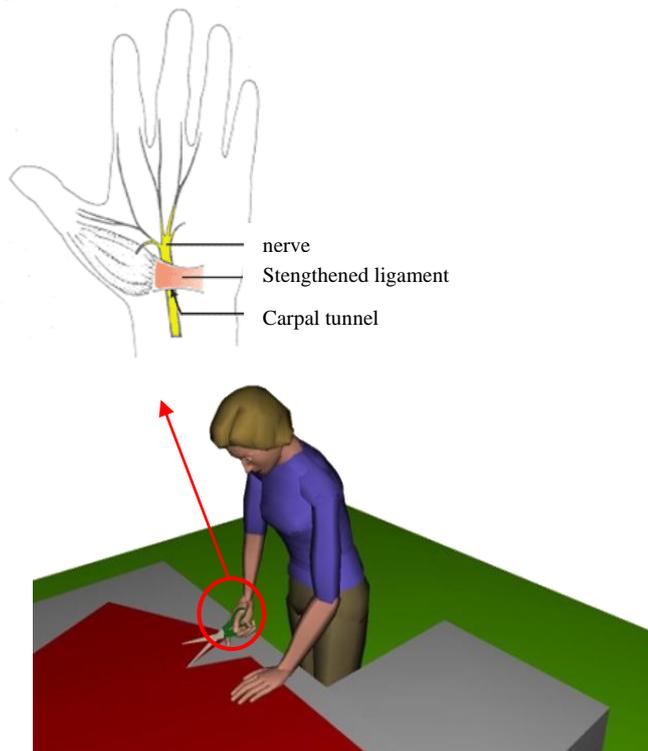


Fig. 1. Carpal tunnel syndrome

According to statistics of the National Health Institut, in 2010 occupational diseases caused by physical factors comprised 53,2% of all announced diseases and total number was 957 cases, which is the highest reported diseases from 2002 (exception 2008 with 693 cases). Long-term excessive onesided overtaxing (406 cases) and vibration (230 cases) were the main causes of these diseases.

Among most widespread diseases belongs carpal tunnel syndrome (Fig. 1). This disease is caused by long-term excessive onesided overtaxing (230 cases in 2010) and by vibrating (160 cases in 2010), carpal tunnel syndrome affects often women than men.

Most endangered working positions are from areas such as agriculture, forestry, health care, textile industry, metal industry, building industry. In 2010 there were the most diseases reported on craftsmen and qualified producers, manufacturers and repairmen, then on machines services.

Diseases	number
Carpal tunnel syndrome caused by long-term excessive onesided overtaxing	230
Carpal tunnel syndrome caused by vibrations	160
Radial humeral epicondylitis	50
Secondary Raynaud's syndrome caused by vibrations	49
Ulnar humeral epicondylitis	28
Trigger finger	25
Arthrosis of thumb	12
other synovitis and tendosynovitis	11
Ulnar nerve lesion at the elbow	10

Tab. 2. Most common diseases in 2010 in the Czech Republic

In the previous table there are mentioned diseases, which come under group of diseases caused by physical factors. In list there are included only diseases, which affect 10 and more persons.

As I mentioned above, the most widespread disease is karpal tunnel syndrome, then follows radial humeral epicondylitis and Secondary Raynaud's syndrome caused by vibrations.

As you can see, occupational diseases still represent great risk not only for workers but also for companies, that these risks bring considerable economic losses.

In Europe just musculoskeletal disorders participate in the origin of occupational diseases and in countries EU represent losses about 3 – 5 % gorss national product.

It is evident that we cannot ignore this area and it is necessary to pay adequate attention.

Therefore within the project Optimization of multidisciplinary design and modelling of virtual firm's production systems there was proposed model for identification of risk of occupational diseases in relation to working activity.

This model is divided into six steps, currently steps 4 and 5 are in process.

4. CONCLUSION

The aim is to propose a model that will be able to set the necessary criteria to determine which risks threatens worker from occupational diseases, and how likely and in what timeframe the disease may occur. On the basis of such information it will then be possible to prevent possible risks, if necessary, and seek measures to reduce their occurrence or even prevent them (Sekulová & Šimon, 2010).

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