Introduction

Compression neuropathies are injuries to peripheral nerves caused by squeezing or stretching the nerve trunk in a fibrous or bone-fibrous canal or by fibrous tissue. They are characterized by pain, sensory disorders and functional disorders due to chronic compression. Occupational compression neuropathies are caused by local vibrations, static physical exertion, and dynamic physical activity. Typical risk activities for the occurrence of the above diseases are work with mechanical hand tools and machines that generate vibrations; pneumatic hammers; chainsaws; percussion - drilling tools, sanders, grinding machines, metal cutting and woodworking machines.

Most common compression neuropathies are:

- Carpal tunnel syndrome - is a compression of the median nerve in the carpal tunnel. The most common clinical manifestation of the disease is tenor atrophy. There is pain in the second, third and fourth fingers, hyperesthesia or hypoesthesia in the area innervated by n. median; nocturnal paresthesias; hyperhidrosis of the fingers and palms.
- Supinator syndrome - damage to the n. radialis leads to a partial drooping arm or to paresis of the radial nerve without a drooping arm. Paralysis is accompanied by pain in the proximal forearm. Nummness and tingling on the radial surface of the forearm and back of the palm, as well as paresis or paralysis of the wrist and finger extensors have been observed.

Compression of n. ulnaris (Glion’s syndrome) causes significantly less frequently than the compression of n. median. It may be due to occupational trauma or congenital muscle abnormalities that narrow the Glion canal. Sensory and motor disorders are observed clinically. Sensory disturbances cover the little finger and the ulnar half of the 4th finger. Motor disorders are expressed in the weakness of the hypothenar muscles and paresis/paralysis of the flexors of the wrist and fingers.

Cubital canal syndrome - is a chronic damage to n. ulnaris by squeezing or rubbing as it passes through the cubital area. In the clinical picture, the main manifestation is pain, which can cover the whole arm. Paresthesias and decreased sensation in the area innervated by the ulnar nerve are also present.

Modern methods of treatment of compression neuropathies include electrotherapy, magnetic field, therapeutic gymnastics, shock wave therapy.

Aim

The aim of the research is to study the application of physical factors in the treatment of occupational compression neuropathies and to assess their effectiveness in improving the health of affected workers.

Materials and Methods

The object of the study are 92 cases of injuries of compression neuropathies in employees of various enterprises in Northern Bulgaria. The persons were hospitalized in the Department of Occupational Diseases and Clinic of Physiotherapy and Rehabilitation, University Hospital - Plovdiv in the period 2019 - 2021. Clinical, laboratory, functional imaging and statistical research methods were used.

Treatment was carried out with physical factors (electrotherapy, magnetic field, therapeutic gymnastics, shock - wave therapy). All participants signed informed consent statements for the study.

The data from the study were processed with software statistical packages Statgraphics Pro for Windows, MS Excel 2013.

Results and discussion

The respondents are 50 women and 42 men.

The age distribution is from 28 to 64 years, with a mean age of 49.6±5.9 years (n=92) (Figure 1).

Figure 1. Distribution of cases by age

The distribution of cases by industry is shown in Figure 2. All cases of occupational injuries were reported in the sewing industry, which is most affected.

Figure 2. The distribution of cases by industry

According to the etiology, the cases are distributed as follows:

1) Caused by local vibrations - 38 cases
2) Caused by biomechanical factors (work process factors) - 54 cases (Figure 3).

Figure 3. Distribution of causes by etiology

Diagnosis “Compression neuropathy of the n. medianus” has almost 2/3 of all cases.

All patients received physiotherapy with electrotherapy, magnetic field, therapeutic gymnastics, shock - wave therapy.

Figure 4. Distribution by diagnoses

The average stay of the hospitalized is 6 days. At discharge and on the 30th day after discharge, a clinical examination of the persons and a direct individual survey were conducted.

Improvement was reported in 87 cases, and 5 of the patients had no significant change in condition. They are aimed at additional consultations and tests to clarify the diagnosis (Figure 5).

Figure 5. Treatment results

Figure 6. Wilcoxon rank test of the ability to perform DLA

Statistical analysis was performed using a non-parametric Wilcoxon rank test for the development of the ability to perform activities of daily living (ADL) for three control points - admission, discharge and control examination on the 30th day (Figure 6).

The Wilcoxon curve represents the results of ADL at the beginning, end of treatment and on the 30th day after discharge, forming a peak and shifting to the right. The observed shift of the Wilcoxon curve to the right is an indicator of a significant improvement in the condition and independence of patients.

Conclusion

1) Compression neuropathies are an important health problem in a number of modern professions.
2) Treatment with physical factors is an effective and reliable approach in cases of occupational compression neuropathies.

References

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Contact

Irena Yordanova Stolova
Department Department “Hygiene, medical ecology, occupational diseases and public health”. Faculty of Public Health, Medical University, Plovdiv, Bulgaria.
E-mail: irena.stolova444@abv.bg