

## ORIGINAL PAPER

# Cervical Syndrome – the Effectiveness of Physical Therapy Interventions

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**Introduction:** The cervical syndrome refers to a set of disorders caused by the changes in the cervical spine and the soft-tissue surrounding it, with pain as the predominant symptom. Sore neck has been a common problem among a large section of today's population. The factors contributing to this issue include the modern lifestyle, prolonged sitting and incorrect, fixed or constrained working postures. The root of these difficulties is found in the mechanical disorders of the cervical spine structures, poor body posture and jerky body movements. In the Scandinavian countries neck pain is considered to be a public health problem. **Methods:** The study evaluated 25 patients with an established diagnosis of cervical syndrome. The research was conducted at the PI Institute of Occupational and Sports Medicine of Zenica–Doboj Canton. Each patient received twenty physical therapy treatment sessions. **Results and conclusions:** The study included 25 patients suffering from the cervical syndrome. The statistical analysis of gender distribution indicated that 36% of the patients were male, while 64% were female. The mean age of study participants was 46.76±4.23. The patients ranged in age from 39 to 54 years, with no statistically significant difference in the mean age of male and female patients,  $p=0.691$ . Analysing the types of occupational activities performed by the patients, the study found a positive relation between neck pain and prolonged sitting at work. The patients who performed office work made up 76% of the total number. Each method of physical therapy applied in the treatment of neck pain patients proved useful. However, the combination of electrotherapy, kinesiotherapy and manual massage proved to be most effective. **Conclusion:** The cervical syndrome is a common medical condition primarily affecting adult population, with prevalence being higher among women and office workers. The condition places a considerable socioeconomic burden on the afflicted. Cervical pain ranges greatly in severity – from moderate to unbearable, thus leading to high levels of work absence as well as to a decrease in the quality of life. Proper physical therapy program can help the patients with neck pain return to their normal everyday activities, improve their quality of life, as well as reduce the absence from work. **Key words:** cervical syndrome, physical therapy, neck pain (NP)

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## 1. INTRODUCTION

The cervical syndrome refers to a set of disorders caused by the changes in the cervical spine and the soft-tissue surrounding it, with pain as the predominant symptom. Sore neck has been a common problem among a large section of today's population. The factors contributing to this issue include the

modern lifestyle, prolonged sitting and incorrect, fixed or constrained working postures. The root of these difficulties is found in the mechanical disorders of the cervical spine structures, poor body posture and jerky body movements.

In the Scandinavian countries neck pain is considered to be a public health problem. In the 1-year study Fejer and

et al. reported the Scandinavian countries to have more neck pain patients than the rest of Europe and Asia. Also, women reported more neck pain than men (1).

Two thirds of the world population experience NP (neck pain) at some point during lifetime, the highest prevalence being among the middle-aged (2). NP is a common symptom affecting the western countries. According to the research conducted in Canada, approximately 67% of adults have experienced NP during their lifetime (3). The survey of Takala and al. estimated lifetime prevalence of NP at 18% for women and 16% for men, while 10% of all patients had pain radiating from neck to the upper extremities (4). The Mini Finland Health Survey, conducted on a population sample of 8000 Finns aged 30 or more, reported chronic neck syndrome in 9,5% of the men and 13,5% of the women (5). In recent years, a significant body of research has proved a high prevalence of NP among adolescents – ranging between 20 and 60% in the developed countries, which is associated with the advance of technology and reduced activity (6).

The most common causes of NP are the degenerative changes within the cervical spine, occurring in even 90% of the cases. The degenerative changes develop in the intervertebral joints, costovertebral joints, uncovertebral joints and intervertebral discs, the disc herniation (7). The annual incidence of

cervical disc herniations is estimated at 5.5 per 100.000 population, occurring most frequently between the ages of 45 and 54 years (according to Kondo et al.) (4) Apart from the degenerative processes, NP can result from a variety of causes, including trauma (fractures, contusions, distortions and ligament tears), inflammatory processes (rheumatoid and infective), as well as metabolic changes, and tumors (7).

The main symptom is pain. Cervical spine pain can radiate to the shoulder, down one or both arms and to the back. The sensation of soreness comprises increased muscle tension in the back of the neck, palpable neck stiffness, reduced neck movement and vegetative disturbances in the region of the head and the upper extremities (ear buzzing, blurred vision, headache, dizziness, fatigue) (8). NP disorders affect both physical and psychological function and can have negative impact on everyday life activities in terms of limiting functional mobility, thus reducing the quality of life (3).

The NP syndrom represents a frequently occurring problem today, and is greatly related to the modern lifestyle. Namely, the number of people who maintain prolonged sitting positions either at home (watching TV) or at work (sitting at a computer desk) has grossly increased. The excessive and incorrect loading of the spine leads to poor posture (9, 10). Due to the forced work-related body posture, the cervical spine (as well as the neck and the shoulder muscles) undergoes great stress. Many studies have confirmed the relation between neck/arm pain and inadequate work-related body posture (11, 12).

## 2. OBJECTIVE

The purpose of this study is to demonstrate the gender and age distribution of patients with cervical syndrome, their daily work-related activities, and to report assessment of pain before and after physical treatment. An additional aim is identify the physical therapy method that offers the most effective pain relief.

## 3. METHODS

The study evaluated 25 patients with an established diagnosis of cervical syn-

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	9	36.0	36.0	36.0
Female	16	64.0	64.0	100.0
Total	25	100.0	100.0	

Table 1. Gender Distribution

Age	N	Mean	SD	SEM	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Male	9	47.22	4.65	1.55	43.64	50.80	39.00	54.00
Female	16	46.50	4.11	1.02	44.30	48.69	40.00	54.00
Total	25	46.76	4.23	0.84	45.01	48.50	39.00	54.00

Table 2. Age Distribution

drome. The research was conducted at the PI *Institute of Occupational and Sports Medicine* of Zenica–Doboj Canton. Each patient received twenty physical therapy treatment sessions. The examiners assessed the degree of pain before and after the treatment. Pain intensity was measured using the visual analogue scale (VAS), with eleven categories, ranging from 0 – 10, where 0 represents – no pain, 1, 2, 3 points – mild pain, 4, 5, 6 points – moderate pain, 7, 8, 9 points – severe pain, and 10 points – worst possible pain. Pain assessment was conducted on the 1<sup>st</sup> and the 20<sup>th</sup> day of the treatment. A detailed and accurate medical history was recorded, including basic patient information. After the collection of the data a statistical analysis was performed, with the results presented in tables and graphs. The level of significance was  $p < 0.05$ . The ANOVA test was employed.

## 4. RESULTS

The study included 25 patients suffering from the cervical syndrome – 9 (36%) men and 16 (64%) women. The descriptive data demonstrates the prevalence of women patients, giving the male:female frequency ratio of 1:1.77.

Age distribution analysis revealed the mean age of the patients included in the study to be  $46.76 \pm 4.23$  years. The mean age of the male participants was  $47.22 \pm 4.65$  years, while that of

the female participants was  $46.50 \pm 4.11$  years. The ANOVA test demonstrated no particularly significant statistical difference to be present in the mean age of the patients in relation to

gender,  $F = 0.162$ ;  $df = 1$ ;  $p = 0.691$ .

Most patients included in the study had been performing office-related jobs – 19 (76%), while 6 (24%) of the patients had been involved in physical type of work. The chi-square test revealed a significant statistical difference in the frequency of the type of work the pa-

	Frequency	Percent	Valid Percent	Cumulative Percent
Office work	19	76.0	76.0	76.0
Physical work	6	24.0	24.0	100.0
Total	25	100.0	100.0	

Table 3. Types of occupational activities performed by the patients participating in the study

Pain	Frequency	Percent	Valid Percent	Cumulative Percent
Mild	4	16.0	16.0	16.0
Moderate	6	24.0	24.0	40.0
Severe	13	52.0	52.0	92.0
Worst possible	2	8.0	8.0	100.0
Total	25	100.0	100.0	

Table 4. Patient groups according to the intensity of NP

	Frequency	Percent	Valid Percent	Cumulative Percent
Acute phase	22	88.0	88.0	88.0
Chronic phase	3	12.0	12.0	100.0
Total	25	100.0	100.0	

Table 5. Phases of the condition at baseline

Pain	Frequency	Percent	Valid Percent	Cumulative Percent
Electrotherapy	16	64.0	64.0	64.0
Kinesiotherapy	5	20.0	20.0	84.0
Manual massage	4	16.0	16.0	100.0
Total	25	100.0	100.0	

Table 6. Physical therapy methods for the treatment of patients with cervical syndrome

tients performed, with those involved in office-related activities representing the larger group,  $\chi^2=6.760$ ;  $df=1$ ;  $p=0.009$ .

Overall, mild neck pain was experienced by 4 (16%), moderate pain by 6 (24%), and worst possible pain by 2 (8%) patients. Severe pain affected the largest group – 13 (52%) patients. There was a significant statistical difference in the frequency of patients regarding the degree of pain, with the predominance of those afflicted by severe pain. The findings were confirmed by the chi-square test,  $\chi^2=11.00$ ;  $df=1$ ;  $p=0.012$ .

Table 5 represents the analysis of the phases of the condition at baseline. Most patients were in the acute phase of the condition 22 (88%), while only 3 (12%) of them were in the chronic phase of it.

Electrotherapy, the commonly used physical therapy method for the treatment of patients with cervical syndrome, was employed for 16 (64%) patients; 5 (20%) patients performed kinesiotherapy, while manual massage was applied with 4 (16%) patients.

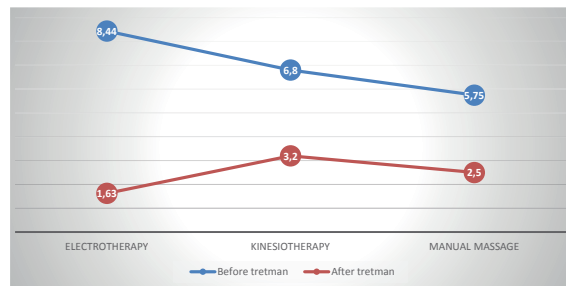
## 5. DISCUSSION

The cervical syndrome is a common medical problem today, affecting women more than men of the same age.

This study included 25 patients. According to the statistical analysis of gender distribution, 36% of the patients were male, and 64% were female.

The study conducted in the USA in 2004 involved 537 patients with neck pain – 42% were man and 58% were women (8). Another study was carried out in Salt Lake City in 2007, including 274 neck pain patients – 74% women and 26% men. (13) Anderson's study, encompassing 990 patients, also had more women than men – 570 women versus 420 men (14).

The mean age of the patients included in this study was  $46.76 \pm 4.23$  years. The patients ranged in age from 39 to 54 years. Also, there was no statistically significant difference in the mean age of male and female patients,  $p=0.691$ .



Graph 1. Average pain intensity score before and after the treatment depending on the type of physical therapy intervention

In the study conducted in the USA by Xuemei L. et al., the mean age of the neck pain patients was 54.15 years (8). In his study that included 990 patients with neck pain, Anderson reported the mean age of the female patients to be 44 years, while the mean age of the male patients was 49 years. (14) Although neck pain affects both younger and older population groups, most studies show greater frequency among people aged 35 to 49, which matches the results of this study (15).

Analyzing the types of occupational activities performed by the patients, this study found a positive relation between neck pain and prolonged sitting at work. The patients who performed office work made up 76% of the total number.

Ariens et al. have reported an increased risk of developing neck pain in workers who sit for more than 95% of the working time compared to those who rarely sit at work (16).

The cervical syndrome may progress from acute to subacute and chronic stages. In the acute phase, the pain may be present from a couple of days to a couple of weeks. If the pain lingers for a few weeks or longer, it is considered to be chronic (affecting around 10% of the patients) (2).

A detailed analysis of the clinical phase of the condition revealed that 88% of the neck pain patients participating in this study were in the acute stage while 12% were in the chronic stage. Assessing the posttherapeutic effects of certain physical treatments on the patients' functional status, a statistical conclusion on the electrotherapy being the most effective method in improving the NP patients' functional status was drawn. Each method of physical therapy applied in the treatment of

NP patients proved useful. However, the combination of electrotherapy, kinesiotherapy and manual massage proved to be most effective.

Ivankovic Prokic assessed the effectiveness of physical therapy interventions for cervical syndrome in a study including a group of 31 patients. The study tracked pain intensity measured with a VAS and the cervical spine movement, from baseline to end of therapy. The physical therapy procedures employed in the treatment were ultrasound (93,54% patients), DDC (70,69%), TENS (32,25%), IFC (22,58%), GC (22,58%), Novocaine electrophoresis (9,67%) and magnetotherapy (6,45%). The results that were based on the VAS scoring system and the increase in the cervical spine range of motion demonstrated a significant improvement in the group, hence confirming the significant clinical effectiveness of physical therapy in the treatment of neck pain, which matches the outcome of this study (17).

## 6. CONCLUSION

The cervical syndrome is a common medical condition primarily affecting adult population, with prevalence being higher among women and office workers. The condition places a considerable socioeconomic burden on the afflicted. Cervical pain ranges greatly in severity – from moderate to unbearable, thus leading to high levels of work absence as well as to a decrease in the quality of life. Proper physical therapy program can help the patients with neck pain return to their normal everyday activities, improve their quality of life, as well as reduce the absence from work.

CONFLICT OF INTEREST: NONE DECLARED

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