



COMPARISON BETWEEN THE PATIENTS OF CERVICAL PAIN AND CERVICAL RADICULOPATHY WITH THE LEVEL OF DISABILITY AND DEPRESSION

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ABSTRACT

Objective: Cervical radiculopathy is a neurological condition characterized by dysfunction of a spinal nerve or its roots in the cervical region. Patient usually present with pain in the neck and one arm, with a combination of sensory or motor loss, or reflex changes in the affected nerve-root distribution. Mechanical or axial neck pain refers to neck pain that does not radiate into the upper extremities but is confined to the cervical, occipital, or posterior scapular areas. **Patients and Methods:** The study includes a total no of 35 patients, 22 patients with cervical pain (group 1) and 13 patients with cervical radiculopathy (group 2). The subjects were asked to fill the questionnaires following which the results were analysed and compared. **Results:** Mean age of the cervical pain (Group 1) subjects in the study was 25.95 and BMI was 23.33. Karl Pearson correlation coefficient value between NDI and BDI in group-1 was found to be statistically significant ($p = 0.04$) 0.54 suggesting a moderate positive correlation. Mean age of the cervical radiculopathy (Group 2) subjects in the study was 28.08 and the BMI was 24.77. Karl Pearson correlation coefficient value of cervical radiculopathy (Group-2) between NDI and BDI was found to be statistically significant ($p = 0.01$) 0.77 suggesting a strong positive correlation. **Conclusion:** In conclusion, early medical and physiotherapy treatment care have to be taken by cervical radiculopathy and cervical pain patients to reduce neck disability, and neck pain, as well as counseling for depression.

KEYWORDS: Cervical pain, cervical radiculopathy, depression, disability.

INTRODUCTION

Cervical radiculopathy is a neurological condition characterized by dysfunction of a spinal nerve or its roots in the cervical region. Patient usually present with pain in the neck and one arm, with a combination of sensory or motor loss, or reflex changes in the affected nerve-root distribution.^[1] In 70 to 75 percent of cases, the most common cause is foraminal encroachment of the spinal nerve due to a combination of factors, including decreased disc height and degenerative changes of the uncovertebral joints anteriorly and zygapophyseal joints posteriorly. Population-based data indicate that cervical radiculopathy has an annual incidence rate of 107.3 per 100,000 for men and 63.5 per 100,000 for women, with a peak at 50 to 54 years of age.^[2] A history of physical exertion or trauma preceding the onset of symptoms occurred in only 14.8% of cases. A monoradiculopathy involving C7 nerve root was the most frequent, followed by C6. A confirmed disc protrusion was responsible for cervical radiculopathy in 21.9% of patients; 68.4% were related to spondylosis, disc or both. During the median duration of follow-up of 4.9 years, recurrence of the condition occurred in 31.7%, and 26% underwent surgery for cervical radiculopathy.^[2]

A combination of radicular pain and sensory deficit, and objective muscle weakness were predictors of a decision to operate. At last follow-up 90% of our population-based patients were asymptomatic or only mildly incapacitated due to cervical radiculopathy. The average annual age-adjusted incidence rates per 100 000 population for cervical radiculopathy in Rochester were 83.2 for the total, 107.3 for males and 63.5 for females. The age-specific annual incidence rate per 100 000 population reached a peak of 202.9 for the age group 50—54 years.^[2]

The mechanisms underlying radicular pain are poorly understood. Nerve-root compression by itself does not always lead to pain unless the dorsal-root ganglion is also compressed.^[3-4] Hypoxia of the nerve root and dorsal ganglion can aggravate the effect of compression, inflammatory mediators — including matrix metalloproteinases, prostaglandin, interleukin-6, and nitric oxide are released by herniated cervical intervertebral disks.^[5-6]

Disc degeneration further narrows the foramen by reducing height between the pedicles, which enclose the

exit passage of the nerve. Concurrently, buckling of the posterior LF occurs from loss of tension, as well as formation of osteophytes at the disc margins.^[7] These combined effects result in circumferential narrowing of the cervical foramen and subsequent neural compression. Approximately 78% of degenerative cervical radiculopathies arise through spondylosis and only 22% from acute disc herniation.^[8] The prevalence of neck pain in the normal population aged over 40 is approximately 20%.^[9-10] and hence the question of the clinical significance of such radiological changes is of great importance. Degenerative changes of the cervical spine, evident on radiographic examination, are part of the normal physiologic ageing process. The most typical changes observed include osteoarthritis of the facets with reduced joint space and disc space narrowing. In contrast to radicular symptomatology, which is anatomically defined and can usually be explained by the presence of osteophytes or narrowing of the intervertebral foramen at the corresponding vertebral level, there is still uncertainty as to whether more widespread clinical symptoms such as axial neck pain can be attributed to observed radiographic changes.^[11-12]

Mechanical or axial neck pain refers to neck pain that does not radiate into the upper extremities but is confined to the cervical, occipital, or posterior scapular areas. Oftentimes, this mechanical pain is associated with severe headaches that may radiate into the occipital, temporal, or periorbital regions. Mechanical neck pain may take many forms; it may be unilateral or bilateral, cause headaches, and lead to stiffness in one or all directions of cervical motion. Although the majority of cases involve injury to the muscle or paraspinal soft tissues and resolve within 6 weeks of onset with conservative treatment alone, large population studies have demonstrated that chronic neck pain persists in 10 to 34% of adults in the general population of these patients, approximately 50% will also complain of headaches radiating into the occipital region.^[13-14]

Disability as an interaction between an individual with an impairment and an environment that lacks adaptations. The Neck Disability Index (NDI) showed adequate test-retest reliability in cervical radiculopathy patients, but poor construct validity, the NDI exhibited moderate reliability (ICC =0.68). The Neck Disability Index is the scale most widely validated among different patient populations. Therefore, it has accumulated more evidence to show that its psychometric characteristics in cervical pain should remain stable in different settings.^[15]

Psychological factors (depression) play a significant role not only in chronic pain, but also in the etiology of acute pain, particularly in the transition to chronic problems. Specific types of psychological variables emerge and may be important in distinct developmental time frames, also implying that assessment and intervention need to reflect these variables.^[16]

MATERIAL AND METHODS

A total of thirty five subjects (both male and female) with 22 cervical pain patients (Group-1) and 13 cervical radiculopathy patients (Group-2) through sample of convenience and diagnosed with cervical pain and cervical radiculopathy by an orthopedician were included in the present study. The subjects were informed in detail about the present study, and informed consent was taken before their inclusion in the study. Further, an assessment including their height and weight was determined for body mass index (BMI) calculation. The working hours in a day for each subject were also included as a part of assessment for the present study. Neck disability index (NDI) and becks depression inventory (BDI) questionnaire were explained to the subjects, and they were asked to fill them. The final scores of NDI and BDI scales were correlated at the end. Who had prior history of psychological disease or disorder, vestibular conditions or any neurological, orthopaedic and cardiopulmonary disease, were excluded from the study.

Procedure

Subjects were taken from physiotherapy clinics in New Delhi. All the questionnaire were explained and filled by the subjects. Assessment was taken from subjects and were explained about the purpose and the nature of the study. Subjects who agreed and willing to participate in the study were included, informed consent and signature were taken. Measurement of height and weight for each patient was taken by standard method (without shoes) to calculate body mass index.

Measurement of Neck Disability Index (NDI)^[17]: This questionnaire is designed to enable the examiner to understand how much the neck pain has affected the ability to manage the everyday activities. The subjects were asked to answer each section by circling the one choice that most applies to them. There are 10 sections in the questionnaire given: Pain intensity, Personal care, Lifting, Reading, Headaches, Concentration, Work, Driving Sleeping, and Recreation. Interpretation Of Scores Of NDI, The highest score of each section is 5 and the total score of the NDI is 50 Scores (out of 50) 0--4 No disability, 5--14 Mild Disability, 15--24 Moderate Disability, 25--34 Severe Disability, >35 Complete Disability.

Measurement of Beck's Depression Inventory^[18]: The BDI is a 21 item, self- rated scale that evaluates key symptoms of depression including mood , pessimism , sense of failure , self-dissatisfaction, guilt, punishment ,self-dislike , self- accusation ,suicidal ideas, crying, irritability, social withdrawal ,indecisiveness , body image change, work difficulty, insomnia, fatigability, loss of appetite , weight loss, somatic pre occupation and loss of libido. Interpretation of scores of BDI 1-10 Normal, 11-16 mild mood disturbance, 17-20 borderline clinical depression, 21-30 moderate depression, 31-40 severe depression, over 40 extreme depression.

STATISTICAL ANALYSIS

SPSS 24 (IBM SPSS Statistics 24.0, IBM SPSS® software, US) package program was used in the analysis of data. The data presented normality according to the Shapiro-Wilk test. Student t test was used for related (paired) samples. Karl Pearson correlation analysis test was used to verify the relationship among the data. Results were reported as mean (SD) for continuous variables. In all of the statistics, significance level was accepted as $p > 0.05$.

RESULTS

Table 1 shows the demographic variables of the subjects. The mean age of the cervical pain (Group-1) subjects in the study was 25.95 and the BMI was 23.33. The mean

age of the cervical radiculopathy (Group-2) subjects in the study was 28.08 and the BMI was 24.77.

Table 1: Demographic variables.

Variables	Group	Mean	St. Deviation
AGE (years)	1	25.95	8.133
	2	28.08	11.288
BMI	1	23.3364	4.61164
	2	24.7769	4.76203

BMI- Body mass index

Table 2 compares the NDI and BDI between the two groups. Values are presented as mean (SD). P value for NDI between group 1 and 2 was 0.04 and p value for BDI between group 1 and 2 was 0.01 suggesting a statistically significant difference between the values.

Table 2: Comparison of NDI and BDI in group 1 and group 2.

VARIABLES	GROUP	Mean (SD)	t-value	p-value
NDI	1	14.36 (11.40)	5.69	0.04
	2	21.73 (11.21)		
BDI	1	19.82 (13.95)	6.23	0.01
	2	21.85 (9.34)		

NDI- Neck Disability Index; BDI- Beck's Depression Inventory

Table 3 shows the Karl Pearson correlation coefficient value between NDI and BDI in group-1. It was found to be 0.54 suggesting a moderate positive correlation.

Table 3: Correlation between NDI and BDI in group 1.

Variables	NDI	BDI
NDI	1	0.54
BDI	0.54	1

NDI- Neck Disability Index; BDI- Beck's Depression Inventory

Table 4 shows the Karl Pearson correlation coefficient value of cervical radiculopathy (Group-2) between NDI and BDI and it was found to be 0.77 suggesting a strong positive correlation.

Table 4: Correlation between NDI and BDI in group 2.

Variables	NDI	BDI
NDI	1	0.77
BDI	0.77	1

NDI- Neck Disability Index; BDI- Beck's Depression Inventory

DISCUSSION

The objective of the present study was to correlate neck disability which was measured by NDI and depression measured by BDI in cervical pain and cervical radiculopathy patients to determine the level of depression due to the disability and to find out under which group of patients suffered more from depression due to the disability associated with it.

In the present study, a strong positive correlation ($r = 0.77$) was seen between neck disability (measured using NDI) and depression (measured using BDI) indicating that disability results in a depression in (group-2) cervical radiculopathy patients. In BDI scale a score of above 17 defines a subject to be as depressed, so the mean value for BDI in group-2 was 21.85 ± 9.34 , the group-2 subjects included in present study could be described as depressed though it was observed that the subject with the highest NDI score had the highest BDI score and thus suggests that neck disability due to cervical radiculopathy results in depression.

Demyttenaere *et al.* on mental disorders among chronic back pain/neck pain conducted in various developing and developed countries across the world stated that mental disorders such as mood and anxiety disorder are more common in persons with chronic neck/back pain than persons without.^[19]

A study done by Krause *et al.* in Germany, also determined that depression and anxiety were highly significantly linked with increasing levels of neck pain. They also noted that people with depression and anxiety were likely to be in the group with high neck pain.^[20]

Another study which was conducted by Blozik *et al.* suggested that patients with chronic pain become depressed. Regression analysis in their study supported that self-efficacy partially mediates the relationship between pain intensity and disability. They identified that both pain intensity and self-efficacy contribute to the development of disability and depression in patients with chronic pain.^[21]

CONCLUSION

In conclusion, early medical and physiotherapy treatment care have to be taken by cervical radiculopathy and cervical pain patients to reduce neck disability, and neck pain, as well as counseling for depression.

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