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Risk Factors Associated With Hypo Mobility of Cervical Spine: A Population Based Case Control Study

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Abstract

Objective: To assess risk factors associated with hypo mobility of cervical spine.

Methodology: A case control Study of 200 participants aged 20-50 was selected from Gujrat city through Non Probability Convenient Sampling technique. Goniometer was used to measure the 6 cervical AROM. Cases (n=100) and controls (n=100) were differentiated according to the ranges. Semi-structured questionnaire along a consent form were distributed including Neck disability index scale. Odds ratios were calculated by logistic regression. The relationship between factors neck mobility were analyzed.

Results: Age was a significant factor and group 31-40 years with odds ratio 0.48 was less prone to develop hypo mobility. We found that Gender (OR=0.59, p=0.055), Marital status (OR=3.143, P=0.03), Migraine (OR=0.44, P=0.008), Sleeping Position (OR= 2.87, P=0.004), Trigger points (OR=2.970, P=0.00) And TMJ (OR=0.257, P=0.10) show Significance. Type of pillow (OR=3.923, P=0.863) was not statistically significant.

Conclusion: The results suggests that Age, Gender ,Marital status, Forward head posture, Trigger points, Migraine, Sleeping Position and TMJ have a significant effect on cervical mobility. Type of pillow is not associated with neck mobility.

Keywords: Hypo mobility; Neck pain; NDI; Goniometer; Risk factors

Introduction

Neck hypo mobility is defined as a condition of decreased flexibility of neck that is because of inelastic cervical joints. Neck stiffness can limit the normal range of motion in the neck and causes pain [1]. This includes flexion (80°- 90°), extension (70°), lateral flexion (20°- 45°) and rotation (90°) [2]. Decreased range of motion is an impairment that accompanies aging [3].

Risk factors can be divided into 3 categories (i.e., individual, physical and psychosocial risk factors).Individual risk factors includes (age, gender and length of employment).Physical risk factors includes computer usage ,forward head posture, exercise habits, BMI, neck strains, falls, whiplash injury and travelling hours. Psychosocial risk factors include stress and job satisfaction [4]. In general population, neck pain affects two thirds of people especially in middle age. According to gender the 1 year prevalence of neck pain was 29% and 40% for men and women, respectively [5]. Results have been observed that a good shaped pillow helps to reduce cervical discomfort [6]. Myofascial trigger points in neck region can easily cause hypo mobility and leads to tension typed headache [7]. People with Forward head posture have lesser neck bending in sitting position [8] An American study stated that migraine has larger impact on cervical discomfort than nausea has [9-10]. The universe must focus in controlling the causes of hypo mobility rather than giving advanced treatments to it. There was no case control study for assessing the risk factors of cervical hypo mobility.

Methodology

This case control study was conducted in Gujrat, Punjab Pakistan from June 2019 to September 2019. The sample size for this study was 200, 100 cases and 100 controls. The subjects who had cervical hypo mobility without any pathology of age 20-50 years were selected as cases. Patients who had any congenital deformity, systemic disease, fractures, trauma and surgery were excluded. While the patients who had hypo mobility due to other conditions were selected as controls. Data was collected through Non probability convenience sampling. Semi-Structured questionnaire along consent forms was used as tool for data collection. Study was approved by Ethical committee at University of Lahore, Gujrat. NDI scale was used to assess the pain intensity. Data was analyzed by SPSS version 22. Chi square test was applied to assess the relationship between variables. The odds ratio with 95% confidence interval was used to evaluate the associations of factors. All statistical results were significant with p<0.05.

Result

Among 200 subjects, 45.5% were males and 54.5% females with age range 20-50 years (Table1). Majority of hypo mobile subjects was married. We found that age was a significant factor (p<0.05) and group (31-40 years) with OR 0.48 times was less prone to develop the risk of hypo mobility (Table 2). Out of 200, 53% of hypo mobile population spent greater than 4 hours in front of computer terminal and proves significant association. It also tells that people with 'no migraine' were 0.442 less prone to develop hypo mobility. The statistically significant (P=0.00) allows association between the sleeping position on pillow and neck mobility. The OR indicates that back sleepers were 2.874 higher at risk than front sleepers. Subjects with friction massage gives 0.571 less chance to develop the risk of hypo mobility but no association between resolving symptoms of neck stiffness and neck hypo mobility(

Table 1: Demographic data.

Characteristics		N (%)	chi square
Age(years)	20-25	71(35.5)	11.996
	26-30	59(29.5)	
	31-40	41(20.5)	
	41-50	29(14.5)	
Gender	Male	91(45.5)	3.408
	Female	109(54.5)	
Marital status	Single	81(40.5)	7.283
	Married	104(51.5)	
	divorced	16(8.0)	

Table 2: Study variables.

Variables	Odds Ratio	95% C.I. for EXP(B)		P-value
		Lower	Upper	
Neck discomfort during computer usage				**<0.05**
<4areas (reference)	1			
>4 areas	0.779	0.442	1.373	0.038
Limitation in mouth opening				**<0.05**
No(reference)	1			
Yes	0.257	0.091	0.727	0.01
Migraine				**0.008**
No(reference)	1			
Yes	0.442	0.242	0.806	0.008
Migraine Attack				**0.179**
None (reference)	1			
Before migraine attack	1.579	0.471	5.289	0.459
During migraine attack	1.237	0.411	3.726	0.706
After migraine attack	2.7	0.805	9.059	0.108
Kind of pillow				**0.863**
None (reference)	1			
Low	3.143	0.238	41.507	0.384
High	1.571	0.546	4.523	0.402
Thin	1.626	0.554	4.769	0.376
Thick	1.702	0.568	5.105	0.342
Type of pillow				**0.819**
None (reference)	1			
Polyester Pillow	2	0.125	31.975	0.624
Regular form pillow	0.815	0.183	3.637	0.788
Latex pillow	1.156	0.273	4.888	0.844
Feather pillow	0.87	0.192	3.936	0.856
Sleeping position				**0.004**
Front sleeper (reference)	1			
Back sleeper	2.874	0.639	12.913	0.169
Side sleeper	0.707	0.148	3.371	0.664
Fetal position	1.667	0.368	7.548	0.507
Kind of resistance				**<0.05**
No(reference)	1			
Yes	4.636	2.359	9.112	<0.05
Headache after pressing trigger points				**<0.05**
No(reference)	1			
Yes	2.97	1.659	5.315	<0.05

P value=0.59) has been observed. Trigger point relationship with hypo mobility in cervical spine was a significantly supported in this current study (Table 2) (Figure 1).

Discussion

The results suggest that individual factors such as age, gender and marital status had a significant effect on cervical mobility. Our results support the previous literature as there is 0.590 times less chance in females (10). Psychological factors such as stress have shown high influence on neck discomfort. The probability of neck discomfort was observed higher in computer users. A previous study of George a. zarb and his colleague investigated that the adopted cervical postures may cause a change in the mandibular rest position (11). The results of Current study supports the previous literature as (p=0.01). The results demonstrated that TMJ factor was statistically significant. Subjects with
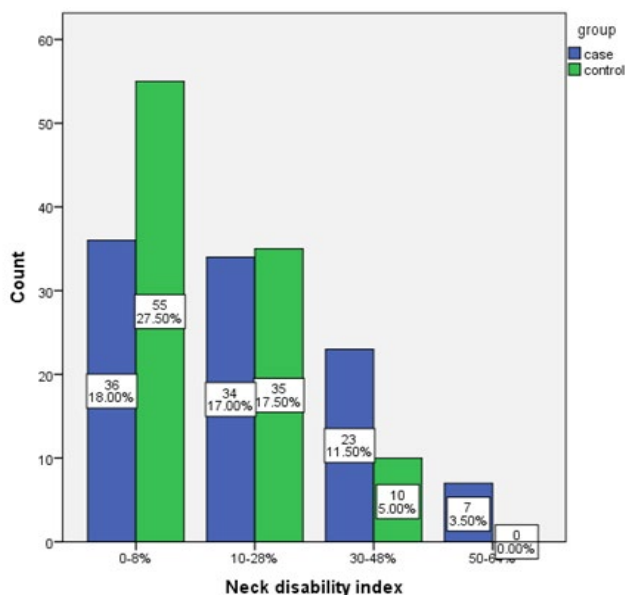
Figure 1: Descriptive Analysis of Neck Disability Index.

migraine had higher impaired cervical movement. Type of pillow was not associated but sleeping position affects were observed. The results suggest that restricted cervical movements are associated with trigger points [Table2].

Conclusion

Non-Modifiable risk factors such as Age, Gender and Marital status and Modifiable risk factors such as Migraine, Sleeping Position, Trigger points And TMJ are associated with neck hypo mobility. The non-associated risk factors were Type of pillow and migraine duration.

Suggestion

The modifiable risk factors such as migraine, sleeping position, trigger points and TMJ should be addressed.

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