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A STUDY ON NEW PATTERNS OF CERVICAL DEGENERATIVE DISEASE AT A UNIVERSITY HOSPITAL IN WESTERN REGION OF SAUDI ARABIA

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ABSTRACT

Introduction: Degenerative cervical spine disorders are referred to one or more of the following process: decrease in signal intensity of disc, posterior disc protrusion, anterior compression of spinal cord and dura, disc space narrowing, foraminal stenosis or osteophytosis. They are asymptomatic in most of the cases. However, the symptoms may vary between different populations. The aim of this study is to find out the pattern of degenerative cervical spine disease at King Abdulaziz university hospital. **Material and Method:** This was a Retrospective study From January 2005 to December 2010, the medical files of the patients were reviewed for demographic data (age and gender), clinical presentation, duration of symptoms, physical examination and progression of disease, radiological examinations with evidence of degenerative cervical. The results were presented in mean ± standard deviation; the correlation between variables was calculated by using Spearman's formula for the nonparametric values. **Results:** A total of 120 cases were reviewed. 63 (52.5%) were females and 57 (47.5%) were males. The mean age was 55.2± 12.8 years. The most common degenerative cervical spine changes were found at C 5-6 levels. The younger patients tended to have higher cervical spine level involvement *P*=0.0. The mean duration of symptoms was 41months. The younger patients tended to present more with the weakness and numbness $p = 0.002$, $p = 0.005$, respectively. 35 (29.1%) of patients found to have lost reflexes and 17 (14.1%) had exaggerated reflexes. **Conclusion:** Younger age group presents with more numbness, weakness and higher level in the cervical spine involvement. May be the new life style with more use of handheld devices and bad flexion posture of the neck plays a role in this aspect Further biomechamical studies need to be conducted to explore the effect of head posture on the cervical spine. The mean duration of symptoms prior to presentation was 41 months seems to be long, an education campaign need to be conducted to the community about the degenerative cervical disease risk factors, prevention and early recognition.

INTRODUCTION

Degenerative cervical spine disorders are referred to one or more of the following process: decrease in signal intensity of disc, posterior disc protrusion, anterior compression of spinal cord and dura, disc space narrowing, foraminal stenosis [1] or osteophytosis. Aging process plays a significant role in the pathogenesis of cervical spine degeneration [1]. They are asymptomatic in most of the cases [3]. It can be hereditary in 73% of cases [2], or sport related [3;4],

The pathophysiology of cervical degenerative disease may be multifactorial with both dynamic factors and static factors that will lead to stenosis resulting in repetitive injury to the spinal cord [5].

In United States a population study at Rochester, Minn, shows the annual incidence of cervical radiculopathy for men and women from all causes is 107.3 and 63.5 cases per 100,000 populations, respectively [6]. Another study from Italy in 1996 reported a prevalence of cervical radiculopathy from spondylosis as 3.5 cases per 1000 people [7].

In this study, we aim to study patterns of cervical degenerative disease at King Abdulaziz University hospital (KAUH) in Western region of Saudi Arabia as we found that there is a lack of studies regarding this subject in Middle east and Saudi Arabia.

MATERIAL & METHOD

Study design: We conducted a retrospective descriptive study.

Ethical approval: The research ethics committee at King Abdulaziz University approved the research project.

Places of study: The study was done at King Abdulaziz University hospital between January 2005 to December 2010.

Inclusion criteria: All included patients were presented at our hospital with cervical degenerative disease.

Exclusion criteria: Patients with cervical spine trauma, infection or neoplasm were excluded.

Methodology: The Patients' demographic data (age and gender), clinical presentation, duration of symptoms, physical examination and progression of disease were reviewed, radiological examinations with evidence of degenerative cervical diseases (such as disc bulge, protrusion or herniation, osteophyte formation, cervical stenosis, spondylolisthesis, facet arthropathy and

spondylosis) were studied. A total of 120 samples were eligible for the study. All cervical spines MRI were reported by a KAUH neuroradiologist. The treatment and outcome were beyond the scope of this study.

Statistical analysis: The results were presented in mean ± standard deviation; the correlation between variables was calculated by using Spearman's formula for the nonparametric values. The results were presented with the *P* value significance and the 95% confidence interval. A *P* value of < 0.05 was considered significant. All the statistical analysis was performed using IBM Corp. SPSS Statistics for Windows, Version 21.0.

RESULTS

A total of 120 patients were included, 63 (52.5%) were females and 57 (47.5%) were males.

Age: The mean age was *M*= 55.2±12.8 years. The mean age for females was 58.89±12.65 years. The mean age for males was 51.16±11.87 years. There is a significant correlation between the gender and age r = 0.254, n = 120, *p* = 0.005. (Figure 1)

The level involves: The most common level involved was C5-6 39 (32.5%) with a mean age of 56±11.6 years, followed by C6-7 level 30 (25%) with mean of age involved for this level of 56.9±13.6 years. There was a significant correlation between the patients' age and the level involved r = 0.222, n = 75, *p* = 0.05 (figure 2), where the younger patients tended to have higher cervical spine level involvement. (Table 1)

There was no significant correlation between the gender and the level involved r = 0.076, n = 75, *p* = 0.516

Duration of symptoms*:* The mean duration of symptoms prior to presentation was 41± 25.6(5,180) months. (Fig 3)

There was a significant correlation between the level involved and the duration of symptoms prior to presentation r = 0.34, n = 63, *p* = 0.006. Where the higher levels involved in the cervical spine tended to present later than the lower levels.

Laterality: 21 (17.5%) patients had their symptoms on the right side, 12 (10%) had their symptoms on the left side and 48 (40%) involved bilateral sides. There was no significant gender correlation with the laterality of the degenerative disease r = 0.092, n = 81, *p* = 0.414.

Pain and radiation: All patients were presented with neck pain, 84(70%) patients were presented with radiation.

Weakness: the number of patients presented with history of weakness was 48(40%), there was a significant correlation between the age and the weakness r = 0.339, n = 81, *p* = 0.002, where the younger patients tended to present more with the weakness.

Numbness: There were 57(47.5%) patients presented with limb(s) numbness. There was a significant correlation between the age and the presentation with numbness r = 0.254, n = 120, *p* = 0.005, the younger patients presented more with numbness.

History of chronic illness*:* The total number of patients had diabetes mellitus (DM) was 30 (24.8%). There was a positive correlation between the history of DM and the history of numbness r = 0.43, n = 84, *p* = 0.001, weakness r = 0.233, n = 78, *p* = 0.04 and finding out the abnormal reflexes r = 0.21, n = 93, *p* = 0.044.

The total number of patients gave history of hypertension (HTN) was 45 (37.2%). There was a positive correlation between the history of HTN and the history of radiating pain r = 0.289, n = 105, *p* = 0.003, numbness r = 0.33, n = 87, *p* = 0.002, weakness r = 0.386, n = 81, *p* = 0.001 and finding out the abnormal reflexes r = 0.353, n = 96, *p* = 0.001. There was no correlation between the gender and the DM (*p* = 0.196) or HTN (*p* = 0.131).

Power: With regard the examination of power, 36(30%) patients were found to have weakness of muscle power. There was no significant correlation between the muscle weakness on the examination and the age (P= 0.572), gender (P= 0.185), level of the cervical spine involved (P= 0.927) or duration of symptoms (P= 0.702).

Abnormal sensory examination: 30(25%) patients were found to have abnormal sensation.

There was no significant correlation between the abnormal sensation on the examination and the age (P= 0.457), gender (P= 0.411), level of the cervical spine involved (P= 0.579) or duration of symptoms (P= 0.152).

Abnormal reflexes: The number of patients found to have normal reflexes on the examination was 57 (47.1%). The number of patients found to have lost reflexes was 35 (29.1%) and exaggerated reflexes 17 (14.1%). There was no significant correlation between the gender and the abnormal reflexes p = 0.8. While there was a correlation between the age and the abnormal reflexes p = 0.004, the older age (>70 years) tended to have hyperreflexia more than the younger age group.

Table1: The correlation between different studied factors with the corresponding significance

Factor A	Factor B	r value	n	*P* value
Age	Gender	0.254	120	0.005
	level involved	0.222	75	0.05
	history of weakness	0.339	81	0.002
	history of numbness	0.254	120	0.005
Gender	level involved	0.076	75	0.516
	Abnormal reflexes	0.26	96	0.01
level involved	duration of symptoms	0.34	63	0.006

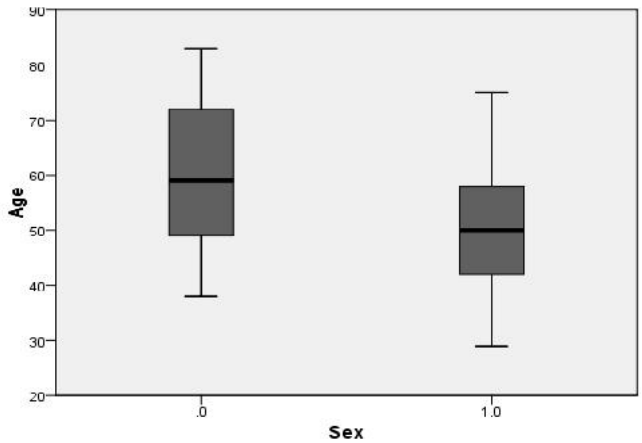

Fig1: the mean age in relation to the gender

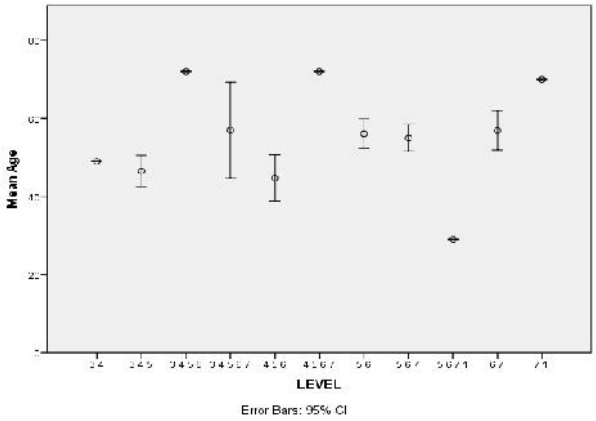

Fig 2: the mean age with the corresponding involved level

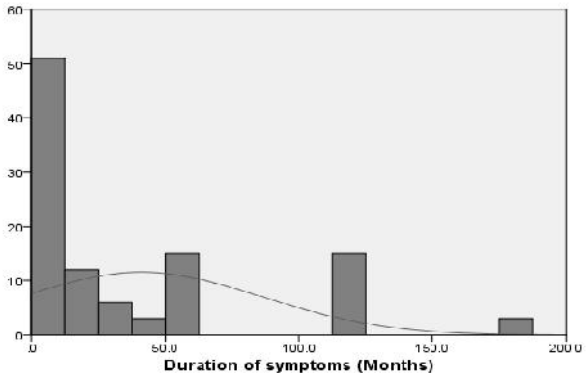

Fig 3: the duration of symptoms in months for all patients

DISCUSSION

The prevalence and incidence of cervical disease due to degeneration of the spine are estimated at a minimum of 605 and 41 per million in North America, respectively. Incidence of cervical spondylotic myelopathy-related hospitalizations has been estimated at 4.04/100,000 person-years,[8] This cervical degenerative disease usually produces intermittent neck pain in middle-aged and elderly patients [9]. The clinical presentation of the cervical degenerative disc disease can be easily grouped into axial pain, radiculopathy and myelopathy[10]. The axial neck pain is the most common presenting symptoms that is proven in this article where all the patients presented with this type of pain. The radiculoapthy refers to the compression of the nerve root that results in radiating pain in the shoulder and upper extremity. This can be associated with sensory and motor changes in the affected limb. Cervical myelopathy refers to compression of cervical spinal cord with the resultant pain and upper motor neuron lesion below the level of the compression. The current article focuses on the common clinical features among patients presenting to King Abdulaziz University Hospital as an initial step to find out the people at risk in order to prevent this problem in the population, From the age prospective, the mean distribution of age is 52.2 years with greater females involvement that is in line with other studies showing the same findings [11;12]. One of the striking feature of this study is the presentation of younger age group with more numbness, weakness and higher level in the cervical spine involvement. Can this be explained by the new life style with more use of handheld devices and bad flexion posture of the neck? A few studies published about this point that could be a significant contributor to the development of degenerative cervical disease in the future [13-16]. Further biomechamical studies need to be conducted to explore the effect of head posture on the cervical spine. Another explanation on younger age involvement with numbness and weakness can be related to more medical education level for this age group with early recognition of warning symptoms and thus seeking medical advices, this concept is recognized in oncology [17], however, it can be the case in symptomatic degenerative cervical disease. The level of the population's knowledge about degenerative cervical disease need to be studied in the future.

The higher levels involved in the cervical spine tend to present later than the lower levels, this can be related to decreasing diameter of the cervical spinal canal going from higher to lower levels[18], so, the presence of degenerative changes will produce symptoms faster than the higher level where the canal can accommodate extra masses prior to compressing the neural element.

The mean duration of symptoms prior to presentation was 41 months seems to be long, however, it is similar to the duration of symptoms reported before [19]. To avoid long term poor outcome [20], an education campaign need to be conducted to the community about the degenerative cervical disease risk factors, prevention and early recognition. The most common level involved was C5-6 has been reported before in other studies [21;22].

The limitations of this study are: the retrospective design, relative small sample and single center experience. A prospective and multicenter study is needed in the future.

CONCLUSION

Younger age group presents with more numbness, weakness and higher level in the cervical spine involvement. May be the new life style with more use of handheld devices and bad flexion posture of the neck plays a role in this aspect Further biomechamical studies need to be conducted to explore the effect of head posture on the cervical spine. The mean duration of symptoms prior to presentation was 41 months seems to be long, an education campaign need to be conducted to the community about the degenerative cervical disease risk factors, prevention and early recognition.

Conflict of interest: The authors declare no actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations that could inappropriately influence, or be perceived to influence, their work.

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