Morphomertic Evaluation of Cervical facet joint Arthrosis & Correlation with age in patient of Neck pain by CT scan.

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ABSTRACT:-

Objective-

To assess the anatomical cervical facet joint arthrosis in patients presenting with neck pain and its correlation with age and cervical spinal levels (C3-C7) by CT scan.

Material & Methods-

The hospital based clinical case control study was conducted for duration of 24 month.
Diagnosed OPD cases of neck pain (20-80 years) with suspected facet joint arthrosis in Department of Anatomy at Mayo Institute of Medical Sciences, Gadia, Barabanki, UP.
During OPD hours, all clinical history related with neck pain was taken and relevant important information taken through consent. CT scan for the cervical spine region was performed in Radio diagnosis department of MIMS for all the enrolled subject (having neck pain)

Results-

Total 83 subjects were enrolled in this with all most equal representation from both sexes i.e males (49.4%) and females (50.6%) with an average age of 57.98 +7.63 years. In our study more severe left cervical facet joint comparison with right cervical facet joint degeneration were observed in 13.3% and 10.5% of study subjects respectively. In almost every subject the neck pain was presenting neurological symptom.

Conclusion-

The facet joints are a type of synovial joint and the articulation participate in the posterior arch of the vertebrae. They provide important role in important structural stability to the vertebral column. These joints are surrounded with a strong fibrous capsule and connect the superior and interior articular facets of the cervical vertebrae.

Keywords: Cervical facet joint, osteoarthritis, cervical spinal nerve injury

INTRODUCTION:-

In older adults, disc height narrowing (DHN) and facet joint osteoarthritis (FJOA) are considered to be common causes of back and neck pain and to be associated with substantial morbidity and economic burdens. [1]. Cervical canal narrowing can be caused by many things such as tumors, infections, trauma, and degenerative changes such as intervertebral disc herniation, osteophytes, and ossification of posterior longitudinal ligaments. [2]. The most common resenting symptom is pain, followed by numbness, tingling, weakness, bowel and bladder dysfunction, spasticity, and paresthesia, These symptoms may causes facet joint arthritis and spinal cord compression as they are caused by these variables. [3,4]. The Zygapophyseal joints are affected by osteoarthritis (OA) of the spine. Facet joint are functional synovial joints between sequential spinal levels and these joints are paired diarthrodial joints present in the posterior part of the vertebral column. When it comes to facet joint osteoarthritis (FJOA), It is believed that both FJOA and degenerative disc diseae are major causes of neck pain, which in effect get a most significant influence on the health-care area and economy of developed nations [4]. And the entire joint, including cartilage and surrounding ligaments, may be affected. [5] in the cervical spine, facet joints are the most important structural components that determine the biomechanical properties of the spine[6].

MATERIAL AND METHODS:-

Study design

The present study case-control was conducted at the Mayo Institute of Medical Sciences (MIMS), Gadia, Barabanki, Uttar Pradesh, where institutional ethics committee approval was obtained prior to data collection.

Study subjects and sample size

Among the cases studied in this study were neck pain patients aged 40 to 80 years with suspected cervical facet joint arthrosis (paresthesia associated restricted neck movement, loss of sensitivities corresponding to dermatome, neck muscular weakness, hypotrophy of neck muscles and rigid neck). A study subject was a patients referred from the OPD of the Department of Orthopaedics and the Department of Neurology of the MIMS for a cervical CT scan at the radio diagnosis department of MIMS. Our study required written informed consent from subject after explaining in detail the purpose and procedure of the study. The total 83 patients were enrolled in the study. There were exclusions from the study for patients with previous head or spine trauma, head or spine surgery, psychiatric disorders, tumours of the head or neck, pregnancy, and congenital anomalies of the cervical spine.

Date collection

The duration of the OPD hours, related clinical history, specific clinical examination, and related information were collected through interviews. CT scan for the cervical region was performed for all the selected subjects using computed Tomography scan machine (Brand name: SIEMENS; Model No: Somatom Scope [G-XL-91368]; Version of machine: CTVC30; and number of Slices;16) and CT scan image was interpreted by senior experience radiologist in reporting of CT scan. The cervical vertebra in consideration was from C3-C7. Digital Weight machine was used to weight the subjects in Kg. The subject's height was measured in cm with measurement tape which was attached to the wall.

Figure 1 : Axial CT scan image of cervical region the showing measurements of cervical facet joint

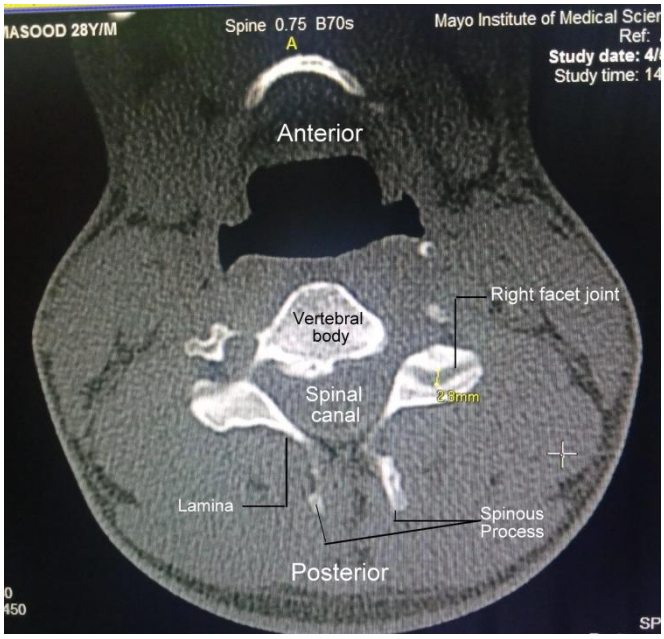
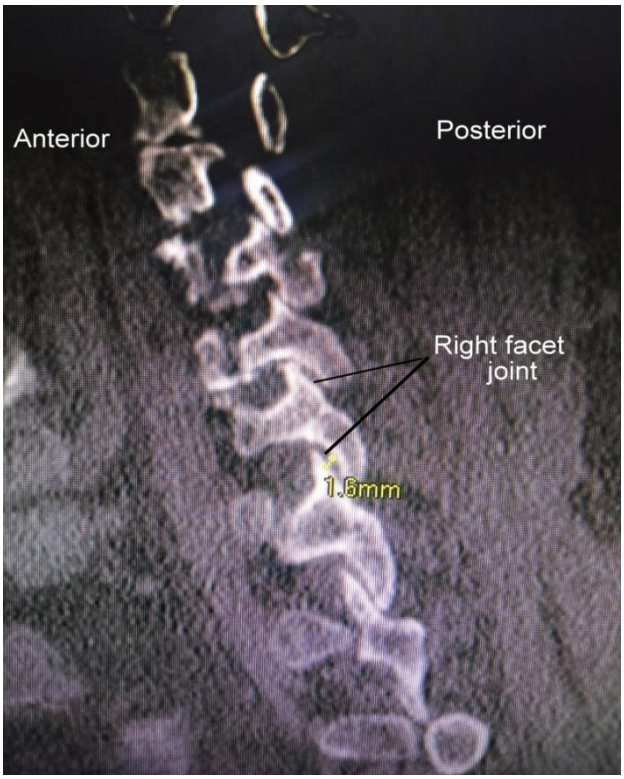


Figure 2 : Sagittal view of CT scan image of cervical region the showing measurements of cervical facet joint



Statistical analysis

The data was entered in MS Excel sheet and analysis was done by using Statistical Package for social sciences (SPSS). Results were analysed with baseline demographic and Numbers and percentages were used for categorical variables, while means and standard deviations were used for continuous variables. With independent variables (age, gender, height, and weight) and adjusted for r squared, several linear regression analyses of neck pain graded and facet joint degeneration were performed

RESULTS:-

Table- 1 :- Baseline characteristics of study subjects (Neck pain).

Variable	**Number (%)/ Mean±SD**
Gender	
Male	41 (49.4)
Female	42 (50.6)
Total	83
Age (in years)	57.98±7.63
Age groups (in years)	
40-50	14 (16.8)
51-60	36 (43.3)
61-70	30 (36.1)
>70	3 (3.6)

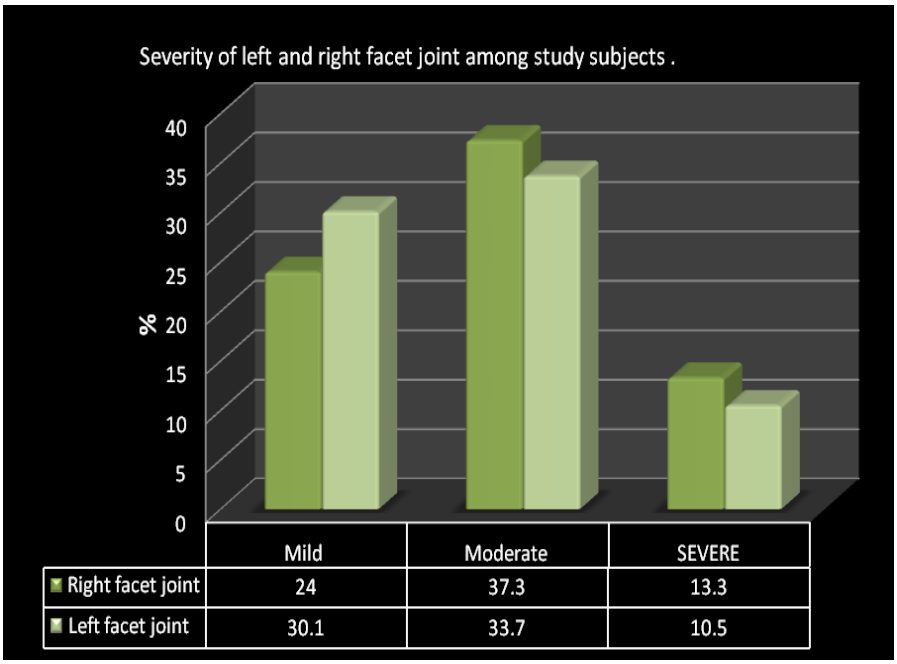
Table 2: Characteristics of cervical left and right facet joint degeneration among study subject (N=83).

Criteria	Left cervical facet joint degeneration Number (%)	Right cervical facet joint degeneration Number (%)
Joint space narrowing		
Yes	42 (50.6)	40 (48.2)
No	41 (49.4)	43 (51.8)
Osteophytes		
Yes	32 (38.5)	30 (36.1)
No	51 (61.5)	53 (63.9)
Irregularity of cervical articular surface		
Yes	41 (49.4)	38 (45.8)
No	42 (50.6)	45 (54.2)
Overall degree of cervical facet joint degeneration		
0	21 (25.3)	21 (25.3)
1	20 (24.0)	25 (30.1)
2	31 (37.3)	28 (33.7)
3	11 (13.3)	09 (10.5)
Severity		
Mild	20 (24.0)	25 (30.1)
Moderate	31 (37.3)	28 (33.7)
Severe	11 (13.3)	09 (10.5)

Table 3: Multiple linear Regression analysis of cervical facet joint degeneration with independent variables among study subjects (N=83)

Dependent variable	Independent variables	R^2	aR^2	P-value
Right facet joint	Age	0.0119	-0.0388	0.9178
	Gender			
	Height			
	Weight			
Left facet joint	Age	0.0085	-0.0424	0.9548
	Gender			
	Height			
	Weight			

Fig: 3 Showed Severity of facet joint degeneration (mild, moderate and severe). Severe left and right facet joint degeneration were observed in 13.3% and 10.5% of study subjects respectively.



DISCUSSION:-

The average age of the 83 patients in our study was 57.98 + 7.63 years. As reported by Freedman BA et al, 64.4 + 13.4 year old patients who met the diagnostic criteria for the "myelopathic" subgroup were enrolled for the study. [7]. In our study, 49.4 % of males and 50.6% of females were enrolled. According to L. Uhrenholt, E. Hauge, Females were less affected by changes in the cartilage than males [8]. In our study, cervical facet joint hypertrophy and expansion of the cervical facet joint capsule secondary to joint effusion may cause such neural compression [9]. Also, due to swollen of cervical facet joint capsule may compress the surrounding spinal nerve root [10]. Facet joints are important factor of spinal pain generators, according to different studies individuals with painful facet joints can get benefit from certain manual therapies. However bony overgrowth can be an important cause of neuroformaminal narrowing, giving rise to irradiating pain [11]. In our study shows the cervical facet joint degeneration features in the sample with neck pain was high prevalence of joint space narrowing (50.6%), Osteophytes of joint degeneration (37.3%) in our body. According to prabavathy et al. They concluded height of pedicle cervical vertebrae, superior and inferior articular processes of cervical vertebrae decreased towards the lower cervical level. [12]. In our study, Frequency of neurologic symptoms such pain (98.8%) Numbness (53.0%), Tingling sensation (25.3%), Weakness of muscles (7.2%) and gait Instability (6%). Radiological investigations have found no correlation between degenerative spinal changes seen on radiologic imaging studies and clinical symptoms of low back pain [13]. Facet joint relaxation with instability and secondary facet arthrosis may then set in [14[.A possible serious problem can occur if the posterior joints are rocked during flexion and extension, resulting in fractures of their articular facets. [15]. Upon examining the patient and studying his history, the facet joint appears to be the source of discomfort, but this cannot be confirmed [16].

CONCLUSION:-

There is an articulation between the facet joints and the posterior arch of the cervical vertebrae, which belongs to the synovial joint. The provide role in important structural stability to the cervical vertebral column. Each cervical vertebra has two articular joints, one within the superior articular facet, the other within the interior articular facet. Cervical vertebrae and cervical facet joints are held together by the posterior ligamentous complex.

Ethical Approval: - The study was approved by the Ethical Committee of Mayo Institute of Medical Sciences Gadia, Barabanki, U.P. -India.

Source of Funding: - Not applicable

Conflict of interest: - The authors declare that they have no known competing financial

Interests or personal relationships that could have appeared to influence the work reported in this paper.

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