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Research Article

ASSOCIATION OF SERUM BIOMARKERS OF ESR AND HS CRP AND ITS CLINICAL EXPLORATION OF OSSIFICATION OF POSTERIOR LONGITUDINAL LIGAMENT

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ABSTRACT

Ossification of the spinal ligaments is the time period used to describe heterotopic ossified lesions that may arise during the spine. Ossification of the posterior longitudinal ligament (OPLL) has by means of ectopic new bone formation which serves because the replacement for ligamentous tissue. The present study aims to find out Clinical exploration of ossification of posterior longitudinal ligament associated with serum biomarker of ESR and hs CRP. A prospective study conducted at a tertiary care centre of Gayatri Vidya Parishad Medical college, Visakhapatnam and approved by the regional ethical committee all patients with OPLL and controls were recruited from Orthopaedics Department. The diagnosis of OPLL was based on radiological findings, together with radiographs and computed tomography (CT) scans of the cervical, thoracic, lumbar spine are included in this study. A total of 95 patients with OPLL (56 men and 39 women: average age 75.3 ± 17.4 years, range 40±85 years) were available for a follow-up of more than 2 years with radiological examinations. The average follow-up duration was 5.2 ± 2.1 years (range, 2±10 years). The outcomes discovered inside the observe recommended that hs-CRP within the patients with OPLL turned into higher as compared to the controls. hs-CRP within the OPLL progression institution changed into higher than in the non-progression group, indicating that infection might arise in OPLL. We accept as true with that those findings represent new understanding that will aid the knowledge of the neighborhood pathology of OPLL.

Keywords :- Ossification of Posterior Longitudinal Ligament, ESR, hs-CRP and Myelopathy.

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INTRODUCTION

Ossification of the spinal ligaments is the time period used to describe heterotopic ossified lesions that may arise during the spine. Ossification of the posterior longitudinal ligament (OPLL) has by means of ectopic new bone formation which serves because the replacement for ligamentous tissue.1 OPLL repeatedly causes narrowing of the spinal canal and it has been recognized as one of the causes of neurological impairment, together with cervical myelopathy and radiculopathy.

About Epidemiological studies have confirmed that cervical OPLL has a male more predominance than the female and whereas thoracic OPLL has predominance in a woman. In addition, a recent genome wide affiliation look at diagnosed six candidate genes for the pathogenesis of OPLL.2Therefore, the onset and growth of ossified lesions can be closely related to sex hormones and genetic historical past.

Many authors reported on OPLL, inclusive of its epidemiology, surgical remedy, and radiological functions.3Computed tomography (CT) has been extensively used to evaluate bone structure and the distribution of ossification inside the entire spine. It has

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been documented that the onset and development of neurological signs are connected with the diploma of canal narrowing because of OPLL and segmental mobility at the level where OPLL is present.4 Patients with OPLL and excessive spinal cord compression due to OPLL often have a couple of lesions in the course of the spine Given that thoracic OPLL every so often leads to a concurrent spinal wire disease with cervical ossification, it is important to assess ossified lesions and diagnose the level at which compression because of ossification effects in neurological deterioration.

Symptoms are progressive, the treatment of choice is surgery to relieve spinal cord compression. It has been reported that several biomarkers, such as leptin and insulin, are related to OPLL. However, we do not know whether or not inflammation occurs in OPLL. A previous study demonstrated that the Creactive protein (CRP) level is increased in patients with heterotopic ossification after total hip replacement. The present study turned prospectively designed to determine whether or not or no longer the serum CRP and erythrocyte sedimentation fee (ESR)awareness are altered in patients with OPLL so that if there is raised stage of serum CRP and ESR is found in patients with OPLL it is probably viable that irritation is one of the causes of OPLL and for that reason anti-inflammatory therapy might be beneficial in these patients

When symptoms are moderate and nonprogressive, conservative treatments and according to iodic observations are enough sufficient, however as soon as signs and symptoms of myelopathy are present and neurologic symptoms are innovative, the treatment of preference is surgery to alleviate spinal card compression. It has been reported that several biomarkers, together with leptin and insulin, are associated with OPLL.[5]A proceeding observe validated that the C-reactive protein (CRP) stage is increased in sufferers with heterotopic ossification after total hip substitute.[6] The aim of the study at became prospectively designed to decide whether or not or not the serum CRP and erythrocyte sedimentation rate (ESR) attention are altered in sufferers with OPLL so that if there may be raised level of serum CRP and ESR is located in patients with OPLL.

Material and methods

A prospective study conducted at a tertiary care centre of Gayatri Vidya Parishad Medical college, Visakhapatnam and approved by the regional ethical committee all patients with OPLL and controls were recruited from Orthopaedics Department. The diagnosis of OPLL was based on radiological findings, together with radiographs and computed tomography (CT) scans of the cervical, thoracic, lumbar spine are included in this study.

Ankylosing spondylitis and metabolic diseases associated with OPLL, such as hypophosphatemic rickets/osteomalacia and hyperparathyroidism, were excluded.

A total of 95 patients with OPLL (56 men and 39 women: average age 75.3 ± 17.4 years, range 40±85 years) were available for a follow-up of more than 2 years with radiological examinations. The average follow-up duration was 5.2 ± 2.1 years (range, 2±10 years). Plain radiographs were used in 35 patients and CT images were used in 60 patients for the evaluation of the ossified lesions of OPLL and to determine OPLL progression. OPLL lengthening of more than 2 mm during the follow-up was judged to be ªOPLL progressionº. The controls were age-matched patients with a diagnosis of cervical spondylosis, lumbar degenerative disease and/or spinal disc disease.

Of the 100 controls, 22 had cervical spondylosis, 73 had lumbar degenerative disease, 3 had cervical disc herniation and 2 had lumbar disc herniation. The diseases were confirmed by image studies, including plain radiographs, CT and MRI. None of the controls had spinal canal ossifications, as confirmed by CT. we should checked any OPLL patient or control subject with inflammatory diseases (such as collagen diseases and rheumatoid arthritis), infections, trauma, myocardial infarction, cerebral infarction or malignant tumors was strictly excluded. No patient or control was taking non-steroidal anti-inflammatory drugs and steroids.

A blood sample was obtained from all participants in the morning of the hospital visit. The hs-CRP was analyzed using an ultrasensitive latex-enhanced immunoassay (L-Latex CRP II) employing the BN ProSpec nephelometer (Dade Behring, Newark, DE).[7]This immunonephelometric assay is a high-sensitivity assay capable of measuring hs-CRP at a concentration of 0.00095 mg/dl. And also included Other routine investigations, as well glucose (Glu), calcium (Ca), inorganic phosphate (Pi), erythrocyte sedimentation rate (ESR) at 1 hour and 2 hours, white blood cell count (WBC), hemoglobin (Hb) and platelet count (PLT), were also assessed.

The two groups were compared using the unpaired t-test, Mann-Whitney U test, and chi-squared test as appropriate. The data are presented as the mean _ standard deviation. All statistical analyses were performed using SPSS for Windows (ver. 22.0; IBM Corp.,Armonk, NY, USA). A p-value of less than 0.05 was considered statistically significant.

Results

The comparison of the serum biomarkers between the OPLL group and the controls.The mean serum hs-CRP concentration was 0.133±0.151mg/dL in the OPLL group and 0.087±0.115mg/dL in the controls,

yielding a statistical difference between the two groups (p = 0.048). ESR-1h and ESR-2h in the OPLL group were higher than those in the control group p = 0.004, p = 0.003, respectively.

In the present study the segmental type of OPLL was found to be most common type accounting for 44% followed by mixed type (23%), continuous type (20%) and localized type (12%).

The comparison of the serum biomarkers between the progression group and the non-progression group.The mean serum hs-CRP concentration was 0.19 ± 0.17 mg/dL in the progression group and 0.097 ± 0.13mg/dL in the non-progression group, acquiescent a statistical difference between the two groups (p = 0.0015). There were no differences among the other biomarkers in the two groups.

Table1. Demographic data of the patients with OPLL (case) and the control

	OPLL	**controls**	**P value**
Gender (M/F)	56/39	73/27	0.44
Age	75.3 ± 17.4	79.3 ± 18.6	0.25
Height	167.2±39.9	158.9±9.6	0.15
weight	65.1±15.6	59.0±11.7	0.09
BMI	26.1±4.6	24.1±2.5	0.38

Table2. Comparison of the biomarkers between the patients with OPLL (case) and the controls.

		OPLL	**controls**	**P value**
Glucose	Mg/dl	249±80.9	119±38.0	0.6
calcium	Mg/dl	9.12±0.37	9.22±4.07	0.15
hsCRP	Mg/dl	0.133±0.156	0.087±0.115	0.048
ESR at 1 hour	mm	17.3±16.4	11.9±7.6	0.004
ESR at 2hour	mm	35.6±25.8	26.3±16.5	0.003
WBC	X100µ/mL	69.3±56.3	62.3±16.3	0.29
Hemoglobin	g/dl	16.6±4.8	14.9±3.6	0.38
PTL	X10000µL	22.6±7.5	21.5±5.6	0.9

Table-3 Distribution of study group as per the radiological type of OPLL

Types of OPLL	**Number of sample**	**Percentage**
Segmental	42	44.2%
Mixed type	22	23.1%
Continuous type	19	20%
Localized type	12	12.6%

Table4.Comparison of the biomarkers betweeen the progression group and the non-progression group.

		progression group	**Non-progression group.**	**P value**
Glucose	Mg/dl	125±45.3.9	123±42.9	2
calcium	Mg/dl	9.12±0.8	9.06±0.35	0.72
hsCRP	Mg/dl	0.19±0.16	0.097±0.12	0.0013
WBC	X100µ/mL	61.5±14.3	57.6±16.4	0.29
Hemoglobin	g/dl	13.2±1.97	14.5±1.66	0.25
PTL	X10000µL	20.3±6.8	21.6±6.8	0.6

Discussion:

The present study exposed two important factors concerning the pathogenesis of OPLL: one being inflammation and the other, calcium phosphate metabolism. The serum concentration of hs-CRP in the OPLL group was higher compared to the control group and ESR was also significantly higher in the OPLL group. Additional, this study showed that serum hs-CRP in the OPLL progression group was significantly higher than that in the non-progression group correlated with Gabay C, Kushner et al[8] These may be due local inflammation is associated with the pathogenesis of OPLL. CRP is one of the most useful acute phase markers to detect inflammation after tissue injury. Pro-inflammatory cytokines, such as interleukin 6 (IL-6), interleukin 1β and tumor necrosis factor alpha (TNF-α) are responsible for the induction of CRP synthesis in the liver.

The rise of both hs-CRP and ESR might imply the presence of inflammation in OPLL. OPLL shows ectopic bone formation in the spinal ligaments and ossification progression is repeatedly observed. Sell Set al studies have demonstrated that the CRP level is increased in patients with heterotopic ossification following total hip replacement and in those with heterotopic ossification after traumatic spinal cord injury.[9] Even though, in present study, there is no encountered any surgical specimens which show local inflammation at the ectopic bony lesion of OPLL and the endochondral ossification process is consistently observed in OPLL.

Current study found that the level of CRP was raised in 89.4% cases of continuous type, 90% cases of localised type, 69.2% cases of mixed type and 92.8% cases of segmental type as well as the level of ESR was raised in 81.4% cases of continuous type, 65.7% cases of localised type, 51.5% cases of mixed type and 73.0% cases of segmental type this study correlated with Jagadish T et al.[10]

CONCLUSION

The outcomes discovered inside the observe recommended that hs-CRP within the patients with OPLL turned into higher as compared to the controls. hs-CRP within the OPLL progression institution changed into higher than in the non-progression group, indicating that infection might arise in OPLL. We accept as true with that those findings represent new understanding that will aid the knowledge of the neighborhood pathology of OPLL.

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