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Serum Endocan levels in chronic tonsillitis

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Abstract. *Serum endocan levels in chronic tonsillitis. Objectives:* This study's objective was to measure the levels of blood biomarkers of endothelial dysfunction in children with chronic tonsillitis.
Methods: Fifty patients with chronic tonsillitis and 50 healthy subjects were included in the study. Blood endocan levels were measured using the Enzyme-Linked Immunosorbent Assay (ELISA). Serum hs-CRP levels were measured using a turbidimetric method.
Results: Median serum endocan (min-max) values were 68.7 (0-720.34) ng/dL in the chronic tonsillitis group and 48.12(0-160.54) ng/dL in the control group. The difference between the two groups was statistically significant (p = 0.007). Serum hs-CRP values were 0.43(0.1-6.70) mg/L in the tonsillitis group and 0.24 (0.08-3.78) mg/dL in the healthy subjects. Serum hs-CRP levels were higher in the patient group than in the control group, but the difference was not significant.
Conclusions: Endocan measurement may be useful in terms of determining the risk of endothelial dysfunction in patients with chronic tonsillitis.

1. Introduction

Chronic tonsillitis can be described like this: focal tonsillitis, hypertrophic or Scleroatrophic cazeous cryptic tonsillitis as recurrent forms, and simple hypertrophic tonsillitis soft form in children and hard form in adults.[1] Chronic tonsillitis is a common disease of childhood. The Palatine tonsil is an organ of local and systemic immune response. Due to its specific location in the Oropharynx and permanent antigen stimulation, the human tonsil is subject to inflammatory processes that frequently become chronic.[2,3] Inflammatory cytokines released during inflammation are responsible for changes in the endothelial cells.[4] Endocan is a Proteoglycan known as endothelialcell-specific molecule-1 (ESM-1). It is released from the vascular endothelial cells in the liver and kidneys.[5-7] Endocan release is regulated by cytokines and growth factors. The Serum Endocan levels have been reported to increase in various conditions, such as sepsis, cancer, inflammatory and cardiovascular diseases.[8-10] The high-sensitivity C-reactive protein (hs-CRP) test can detect lower CRP levels than classic CRP assays. To put it in another way, hs-CRP is a sensitive marker of low-grade systemic inflammation.[11]

Our scan of the literature revealed no previous investigation of the serum Endocan levels in children with chronic tonsillitis. This study, therefore, investigated the Endocan levels as a marker of endothelial dysfunction in child patients with chronic tonsillitis.

2. Materials and methods

Patients

Fifty patients with chronic tonsillitis and 50 healthy subjects were included in the study (Table 1). Patients with documented three or more acute tonsillitis per year were included in this study. Individuals with anemia, diabetes mellitus, arterial hypertension, valvular heart disease, congenital heart disease, renal or hepatic disease, abnormal thyroid function, malignant disease or chronic systemic inflammatory disease were excluded. The control group consisted of healthy children who were admitted to the hospital for routine examination. The permission from the institutional ethical committee was taken for the study. The consent form was received from all the patients to participate in the study.

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Table 1
Comparison of demographic data between the patients and controls

	Patients	Controls	p-value
Number	50	50	
Age	6.7±1.8	6.5±1.7	0.814
Boys/Girls	27/23	26/24	0.734
BMI	17.4±1.5	17.2±1.4	0.923

*: Mean p-value <0.05. BMI: body mass index

Table 2
Serum endocan and hsCRP levels in the chronic tonsillitis patients and the control group

		Endocan(gr/dl)	HsCRP(mg/dL)
Patients	N	50	50
	Median	68.76	.4300
	Minimum	.00	.100
	Maximum	720.34	6.70
Controls	N	50	50
	Median	48.12	.2400
	Minimum	.00	.08
	Maximum	160.54	3.78
P		P=0.007*	p>0.05

*: Statistically significant

Biochemical test

Blood collected in the morning after overnight fasting was placed into serum separation tubes for hsCRP and Endocan measurements and sent to the laboratory immediately after collection. Following coagulation, blood was centrifuged at 2000xg for 10 min. The serum specimens obtained were placed into Eppendorf tubes and stored at -80ºC until analysis.

Tubes containing blood specimens collected for routine biochemistry tests from the patient and study groups before any drug therapy was started or surgical procedure performed were kept in an upright position for 10-20 min and then centrifuged for 15 min at 4000 rpm at +4°C. The serum specimens were aliquoted and kept in a deep freeze at -80˚C until the day of analysis.

ESM-1 levels in the serum specimens were measured using the ELISA technique with a "Human ESM-1 ELISA Kit" (Aviscera Bioscience, Lot: 20111718, USA) following the manufacturer's instructions.Values below the detection threshold of 9.8 ng/dL were regarded as '0.' The analysis was performed using a BioTek Power Wave ST microplate spectrophotometer r (USA) device. The serum hs-CRP levels were measured using a Turbidimetric method(Beckman Coulter AU5800, USA).

Statistical analysis

All the values were expressed as mean±standard deviation (SD). TheMann-Whitney U test was used to analyze the variance among the groups for continuous variables, if appropriate. The student's t-test was used to compare the age and BMI. Pearson'schi-square test was used to comparethe sex ratio. These calculations were performed on statistical software (IBM SPSS statistics 20, IBM, NY, US). All p-values reported were two-sided, and statistical significance was set at <0.05.

3. Results

The median serum (min-max) values were 61.51 (0-623.42) ng/dL in the chronic tonsillitis group and 50.53 (0-170.99) ng/dL in the control group. The difference between the two groups was statistically significant (p = 0.007). The serum hs-CRP values were 0.36 (0.12-5.20) mg/dL in the tonsillitis group and 0.26 (0.07-4.01) mg/dL in the healthy subjects (Table 2).The serum hs-CRP levels were higher in the patient group than in the control group, but the difference was not significant. Correlation analysis revealed no correlation with Endocan and hs-CRP in either group.

4. Discussion

Endocan is a chondroitin/dermatan sulfate proteoglycan involved in tumor cell proliferation, endothelial cell migration, and tumor growth.[11,12] Endocan is synthesized and released from endothelial cells as a response to proangiogenic factors such as vascular endothelial growth factor (VEGF) and proinflammatory cytokines such as IL-1β and TNF α.[7,14,15]

Balta et al. investigated the serum Endocan and CRP levels in Behçet's disease (BD), and a chronic inflammatory multisystemic disease.[16] They reported significantly higher serum Endocan levels in patients with BD compared to healthy individuals and attributed this to endothelial dysfunction. That study also reported that the serum Endocan levels

were correlated with CRP and with the disease activity.

Some studies have suggested that Endocan can be a good marker of endothelial dysfunction and multi-organ failure in sepsis. Endocan has also been described as a potential predictor of survival in sepsis.[17,18] In a study from 2015, Seo et al. Investigated the serum Endocan levels in various infectious diseases such as urinary tract infection, respiratory tract infection and endocarditis. The Serum Endocan levels were significantly elevated in these patients. They also determined that Endocan was not correlated with CRP, but that the serum Endocan levels were particularly associated with Bacteremia. CRP is a protein produced by the liver as a response to increasing IL-6. The serum levels are therefore widely used to show the presence of inflammation as an acute phase reactant. In contrast, Endocan is released by the vascular endothelium. Endocan levels may, therefore, rise even if the CRP levels are not high, especially at the beginning of infection, and this increase can be used to show the presence of Bacteremia. Seo *et al*.[19] Therefore speculated that endocan may be a biomarker that increases during infection independently of the CRP levels.

Hs-CRP is a sensitive marker of low-grade systemic inflammation. In addition to acute infections, known as systemic inflammatory conditions, height, body mass index, diabetes and cigarette and alcohol use can also affect hs-CRP. This must be remembered when interpreting hs-CRP levels.[7]

As upper airway infections are very common in ENT practice, most of this infection may result in chronic inflammations. Chronic tonsillitis is a common disease in Otolaryngology practice. Since endocan is a marker that increases in chronic inflammations, we aimed to investigate the levels of Endocan in patients with chronic tonsillitis..The Endocan levels may have risen in our patients in association with chronic tonsillitis. However, the serum hs-CRP levels were not different between the patient and healthy groups. Hs-CRP shows low-grade inflammation. On that basis, it may be suggested that Endocan increases before CRP due to inflammation. In addition, the serum Endocan levels also increase in endothelial dysfunction, as well as during inflammation. The increase in the serum endocan levels seen in these patients may, therefore, show endothelial dysfunction.

5. Conclusıons

The serum Endocan levels in this study were higher in children with chronic tonsillitis. Therefore,endocan measurement may be useful in terms of determining the risk of endothelial dysfunction in patients with chronic tonsillitis.

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