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Serum Level of Galectin-3 in Patients with Infantile Haemangioma

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Abstract

Infantile haemangioma (IH) is the most common benign vascular lesion occurring in infancy and childhood. Besides typical clinical presentation, histological findings and immune-histo-chemical cellular markers may be of interest for the characterization of each stage of IH (proliferation and involution). Galectin-3 (gal-3) is a pro-angiogenic molecule that plays an important role in vascular endothelial proliferation and angiogenesis. So this work aimed to evaluate serum level of gal-3 in patients with IH to assess its possible role in the pathogenesis of tumor. To achieve this aim, 60 subjects were included in this study, divided into two main groups. Patient group included 40 cases with IH and control group included 20 age and sex matched healthy participants. Five ml of venous blood sample was taken from each participant and the assay was done by using human gal-3 ELISA kit. Galectin-3 serum level was significantly higher in patients than controls (P=0.001).Our results reported that Gal-3 may be involved the pathogenesis of IH and it can be a possible diagnostic biomarker in IH cases.

Keywords: Infantile, Haemangioma, Galectin-3.

1. Introduction

Infantile haemangioma is the most common benign vascular lesion occurring in infants that usually develops soon after birth due to endothelial cell proliferation. They have a characteristic clinical life cycle consisting of progressive growth after birth followed by spontaneous involution starting from the second year and continues over a course of 3 to10 years [1].

Galectin-3, a glycoprotein with a 31-kDa molecular weight, is widely expressed in human tissues, including all types of immune cell (macrophages, monocytes, dendritic cells, eosinophils, mast cells, natural killer cells, and activated T and B cells), epithelial cells, endothelial cells and sensory. It has been suggested to play a role in a variety of biological processes such as cell growth, cellular adhesion, cell cycle regulation, neoplastic transformation and metastasis [2].

Galectin-3 is a pro-angiogenic molecule that plays an important role in vascular endothelial proliferation and angiogenesis. Also, it is important for cell survival, due to its interaction with certain survival‐associated proteins, including B‐cell lymphoma-2 (Bcl‐2). Gal‐3 is pivotal in numerous biological activities including cell growth, apoptosis and angiogenesis [3].

2. Patients and methods

2.1 Type of study

This study was prospective case control study conducted in the period from October 2018 to August 2019. Subjects were recruited from the out-patient clinic of Benha University Hospital after approval of the Dermatology, Venereology and Andrology department and Clinical Pathology department in Faculty of Medicine, Benha University.

2.2 All participants in this study were subjected to the following

Detailed history (age, sex, premature delivery, low birth weight, onset, course, duration, site and size of IH), complete general and dermatological examination for exclusion of any other diseases or syndroms (e.g. LUMBAR syndrome) and confirmation of the diagnosis was done by U/S.

2.3 Laboratory investigations

Evaluation of serum gal-3 by enzyme-linked immunosorbent assay (ELISA) kits.

2.4 Measurement of human galectin-3

The assay was done by using human gal-3 ELISA kit supplied by Sun Red Biotechnology Company, made in Shanghai, China. Lot number: 201-12-1952.

2.5 Statistical analysis

The collected data were computerized and statistically analyzed using IBM® SPSS® platform (Statistical Package for Social Science).

3. Results

This study was done at Benha University Hospitals. It was a prospective case control study to estimate serum level of gal-3 and determine its possible role in pathogenesis of IH.

In table (1), the comparison between patients and controls regarding serum level of gal-3 showed high significant difference between them which indicates a possible role of gal-3 in IH pathogenesis.

4. Discussion

Galectin-3 has been shown to induce angiogenesis. It modulates VEGF and bFGF

mediated angiogenesis that modulate endothelial cell migration during this process. It has also been linked to angiogenesis and migration of endothelial cells through integrin-linked kinase signaling [4].

Table (1) Comparison between patients and controls regarding gal-3 serum level

	Patients (n=40)			Controls (n=20)			ZMWU	P
	Mean	± SD	Range	Mean	± SD	Range		
Gal-3 ng/ml	19.32	11.3	3.05-30.3	6.4	7.09	1.5-27.6	3.41	0.001

The current study is the first one to evaluate serum level of gal-3 at this pediatric age to discuss its role in pathogenesis of IH. The results revealed that serum level of gal-3 patient groups was significantly higher than that of controls, confirming the role of gal-3 in tumor angiogenesis.

This goes with the study of [5], as they evaluated serum level of gal-3 in oral SCC. They reported that gal-3 significantly stimulate proliferation and angiogenesis in the tumor.

The limitation of this study was that it is a single center study and our population was relatively small sample size.

5. Conclusion

In conclusion, this data add novel aspects to study the role of gal-3 in the pathology of IH phases. Gal-3 affects many biological aspects in humans as angiogenesis and apoptosis which play important roles in the pathology of IH phases (proliferative and involuting phases). There was a significant association between gal-3 level and IH pathogenesis. Increasing level of gal-3 was significant indicator of IH.

6. Acknowledgement

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