

ABSTRACT

The purpose of the study was to examine and evaluate the expression of CD11a, CD11b and CD11c integrins on conjunctival epithelial cells in patients with dry eye syndrome.

Integrins are adhesion molecules that affect the crucial role in physiological processes, carcinogenesis, as well as in inflammatory and allergic reactions. Their heterodimeric structure, as determines recognition, association and regulates connections of various ligands, including extracellular matrix molecules and immunoglobulin superfamily receptors. $\beta 2$ integrins are composed of the α and β chain structures. The α chain is responsible for specific binding to the ligand, while the β chain defines the functions of the integrin receptor and its connections joined with cytoskeleton proteins. The $\beta 2$ integrins compose the $\beta 2$ chain, which simultaneously on of the three α subunits producing the term CD11a, CD11b, CD11c. The group of $\beta 2$ integrins includes: LFA-1, Mac-1 and glycoprotein-150/95. Are ligand integrins opposing receptors ICAM-1, ICAM-2, ICAM-3, VCAM-1. ICAM-1 is a ligand for CD11a/CD18 integration. There appears a surface of leukocytes, endothelial cells, keratinocytes and epithelial cells. Also LFA-1 is inactive against circulating leukocytes. Some of an inflammatory mediators, such as IL-1 or TNF are responsible for activation and connective. When LFA-1 and ICAM-1 are connected leads to the activation and migration of T cells. ICAM-2 is associated with CD11b/CD18 integrin. CD11a and CD11b integrins play important part in inflammation.

DED (dry eye disease) also known as dry eye syndrome DES is a multifactorial disease that affects the quality of life of patients. Loss of water through evaporation may contribute to the disease, which disrupts tear homeostasis and causes inflammation directly or indirectly. Disrupted homeostasis leads to impaired immune responses, which further contributes to the formation of dry eye disease.

The study group consisted of 40 patients (20 women and 20 men) diagnosed with dry eye syndrome, aged 30 to 65, with no general diseases or other illnesses of the eye. The comparison group was formed 40 healthy people (21 women and 19 men) without coexisting diseases in a similar age range.

The tested material of conjunctival epithelial cells, in which the percentage of CD11a, CD11b and CD11c cells was assessed by flow cytometry.

The scientific research performed a higher percentage of CD11a cells in the study group than in the control group. The percentage of CD11b cells in patients with DSD was similar to the value obtained in the control group. The percentage of CD11c cells in the study group and in the control group statistically did not differ significantly.

The analysis of results obtained leads to the assumption that, It can be stated that the observed higher percentage of CD11a cells in conjunctival epithelial cells may be caused by an increased expression of ICAM. The increase in ICAM promotes the activation and migration of lymphocytes to the ocular surface. The LFA-1: ICAM-1 interaction plays an important role in inflammation of the ocular surface and in the immune response. This interaction facilitates the formation of an immune synapse, leads to the differentiation of T lymphocytes and supports the migration of activated cells from the vessels to the site of inflammation. The clinical severity of DSD correlates with the expression of CD11a and CD11b integrins. Patients with moderate DSD show an increased expression of CD11a, while patients with severe DSD present an increase in the expression of CD11a and CD11b. The CD11a and CD11b integrin elevates the migration of T lymphocytes to inflammatory and may be a factor favoring the development of DSD. Monitoring the local expression of these integrins may be an additional test in the assessment of the development of eye lesions and it can become a marker of inflammation in this disease entity.

To fully understand the adhesion processes, researches are obligatory on the expression of integrins and the search for factors influencing this process is necessary.