

## Occult Haemolacria Paradigm in the Study of Tears

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**Abstract :** To investigate the contents of tears to determine latent blood. Methods: Tear samples from 72 women were studied with the microscopy of tears aspirated with a capillary and stained by Nocht and with a chemical method of test strips with chromogen. Statistical data processing was carried out using statistical packages Statistica 10.0 for Windows, calculation of Pearson's chi-square test, Yule association coefficient, the method of determining sensitivity and specificity. Results:, In 30.6% (22) of tear samples erythrocytes were revealed microscopically. Correlations between the presence of erythrocytes in the tear and the phase of the menstrual cycle has been discovered. In the follicular phase of the cycle, erythrocytes were found in 59.1% (13) people, which is significantly more ( $\chi^2=4.2$ ,  $p=0.041$ ) compared to the luteal phase - in 40.9% (9) women. In the first seven days of the follicular phase of the menstrual cycle the erythrocytes were predominated of in the tears of women examined testifies in favour of the vicarious bleeding from the mucous membranes of extragenital organs in sync with menstruation. Of the other cellular elements in tear samples with latent haemolacria, neutrophils prevailed - in 45.5% (10), while lymphocytes were less common - in 27.3% (6), because neutrophil exudation is accompanied by vasodilatation of the conjunctiva and the release of erythrocytes into the conjunctival cavity. It was found that the prognostic significance of the chemical method was 0.53 of the microscopic method. In contrast to microscopy, which detected blood in tear samples from 30.6% (22) of women, blood was detected chemically in tears of 16.7% (12). An association between latent haemolacria and endometriosis was found ( $k=0.75$ ,  $p\leq 0.05$ ). Microscopically, in the tears of patients with endometriosis, erythrocytes were detected in 70% of cases, while in healthy women without endometriosis - in 25% of cases. The proportion of women with erythrocytes in tears, determined by a chemical method, was 41.7% among patients with endometriosis, which is significantly more ( $\chi^2=6.5$ ,  $p=0.011$ ) than 11.7% among women without endometriosis. The data obtained can be explained by the etiopathogenesis of the extragenital endometriosis which is caused by hematogenous spread of endometrial tissue into the orbit. In endometriosis, erythrocytes are found against the background of accumulations of epithelial cells. In the tear samples of 4 women with endometriosis, glandular cuboidal epithelial cells, morphologically similar to endometrial cells, were found, which may indicate a generalization of the disease. Conclusions: Single erythrocytes can normally be found in the tears, their number depends on the phase of the menstrual cycle, increasing in the follicular phase. Erythrocytes found in tears against the background of accumulations of epitheliocytes and their glandular atypia may indicate a manifestation of extragenital endometriosis. Both used methods (microscopic and chemical) are informative in revealing latent haemolacria. The microscopic method is more sensitive, reveals intact erythrocytes, and besides, it provides information about other cells. At the same time, the chemical method is faster and technically simpler, it determines the presence of haemoglobin and its metabolic products, and can be used as a screening.

**Keywords :** tear, blood, microscopy, epitheliocytes

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