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Practical use of impression cytology in patients with keratitis and corneal ulcers: a case series analysis

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Objectives: To study the morphological characteristics of the cornea and to evaluate the diagnostic and practical significance of the impression cytology (IC) in severe keratitis and corneal ulcers.
Materials and methods: 38 patients (42 eyes) with keratitis and corneal ulcers were included in the study, mean age of participants was 49.2 ± 16.9 years (from 21 to 75 years). There were 20 men (52.6 %) and 18 women (47.4 %). Several risk factors of severe keratitis and corneal ulcers were identified in this study: contact lenses wearing–11, trauma–8, chronic blepharoconjunctivitis–6, multifactorial–17. The duration of keratitis ranged from 7 to 35 days. Patients received more than 1 course of antibiotics in 83.3 %. Surgery was performed in 31 eye (keratoplasty, AM graft, conjunctival flap). Based on the clinical symptoms, mixed infection was suspected in these cases. IC, bacteriology were performed in all cases. PCR was available in 20 cases. The IC method was used to evaluate the cellular composition and morphofunctional state of ocular surface epithelial cells. The calculation of nuclear-cytoplasmic ratio was performed. The integrity of cellular elements, leukocyte cells, fibroblasts (fibrocytes), and other morphological elements, including bacterial and fungal pathogens, were visualized.
Results: The study established morphological signs and characteristics in keratitis and corneal ulcers of bacterial, fungal and viral etiology that helped to verify personalized etiological diagnosis. „Shadow cells" and cocci have been found in cases of mixed herpes and bacterial infection. The morphological elements of fungi identified by the IC were specific to determine the nature of the fungal microflora (Candida spp., Aspergillus spp.). The effectiveness of IC in this study was high–69 %, which is especially important in cases of mixed infection, fungal and bacterial, when the diagnosis cannot be confirmed based on clinical symptoms. Coagulase-negative staphylococci, MRSA and Candida spp. were predominant etiological agents.
Conclusions: The use of IC in keratitis and corneal ulcers is minimally invasive and has high practical significance. Results can be obtained within 24 hours. The morphological characteristics of ulcer, detection clear signs of mixed infection (bacteria and fungi, bacteria and herpes viruses), can be used for appropriate treatment correction.
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