COMPARATIVE HISTOMORPHOLOGICAL CHARACTERISTICS OF GINGIVAL TISSUES IN DIFFERENT CLINICAL FORMS OF GINGIVITIS

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Background. Gingivitis is a common inflammatory disease of periodontal tissues characterized by structural and cellular alterations. Histomorphological assessment plays an important role in distinguishing its clinical forms and evaluating the severity of pathological changes.

Objective. To investigate the histomorphological characteristics of gingival tissues in catarrhal gingivitis and compare them with hypertrophic, ulcerative-necrotic, and atrophic forms of gingivitis.

Materials and Methods. A comparative histological examination of gingival tissue specimens was performed using hematoxylin and eosin staining. Epithelial structure, inflammatory infiltration, vascular alterations, interstitial edema, and collagen fiber organization were evaluated. Exfoliative cytological preparations from patients with catarrhal gingivitis were additionally examined using Romanowsky–Giemsa staining and digital morphometric analysis with QuPath software.

Results. Catarrhal gingivitis was characterized by acanthosis, spongiosis, elongation of epithelial rete ridges, lymphoplasmacytic infiltration, vascular dilatation, and interstitial edema. Hypertrophic gingivitis demonstrated pronounced epithelial hyperplasia, increased collagen deposition, and persistent chronic inflammatory infiltration. Ulcerative-necrotic gingivitis exhibited severe epithelial destruction, tissue necrosis, dense neutrophilic infiltration, fibrinous-necrotic exudation, and marked vascular hyperemia. Atrophic gingivitis was associated with epithelial thinning, shortened epithelial projections, connective tissue fibrosis, and relatively mild inflammatory infiltration. Digital cytomorphometric analysis in catarrhal gingivitis revealed an increase in mean epithelial cell area from 1986.4 to 2118.7 μm² and cytoplasmic area from 1839.6 to 1980.5 μm² after treatment, whereas nuclear area decreased from 146.8 to 138.2 μm².

Conclusion. Each clinical form of gingivitis exhibits distinct histomorphological characteristics. Catarrhal inflammation, epithelial hyperplasia, tissue necrosis, and fibrosis represent the predominant features of catarrhal, hypertrophic, ulcerative-necrotic, and atrophic gingivitis, respectively. Histological examination combined with digital cytomorphometry may provide useful additional criteria for differential diagnosis and morphological assessment of gingival tissue changes.

Keywords: catarrhal gingivitis, histomorphology, gingival inflammation, epithelial hyperplasia, cytomorphometry, periodontal tissues.

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