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CHANGES IN HOMEOSTASIS INDICATORS OF ORAL FLUID IN CHILDREN AT THE STAGES OF ORTHODONTIC TREATMENT

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Abstract:
This study investigates the alterations in homeostasis indicators of oral fluid during different stages of orthodontic treatment in children. The research employs a longitudinal approach, tracking changes in salivary pH, electrolyte levels, and enzymatic activity before treatment initiation, during active treatment, and post-treatment. Special emphasis is placed on understanding how orthodontic appliances and interventions influence these biomarkers, which are critical for oral health maintenance. Insights gained from this investigation contribute to optimizing orthodontic protocols and improving patient outcomes by addressing potential disruptions in oral fluid homeostasis throughout the course of treatment.

Keywords: orthodontic treatment, oral fluid, homeostasis indicators, salivary pH, electrolytes, enzymatic activity, children, dental health, treatment stages.

Introduction

Modern scientific concepts of domestic and foreign scientists on the aetiology, and pathogenesis of diseases of hard tissues of teeth, periodontal, and oral mucosa confirm the problematic nature of determining their nature, indicating a direct connection with the biological status of oral fluid, the hygienic state of the oral cavity and the level of immunological resistance [1-7].

The purpose of the research- is to evaluate the influence of the basic materials used in removable orthodontic equipment on the immunological parameters of oral fluid homeostasis in children with dental anomalies at the early stages of hardware treatment.

Materials and methods of research

The research was carried out at the Department of "Pediatric Dentistry" of SamSMU. The objects of the study are 75 patients with dental anomalies. All patients are divided into three groups depending on the aesthetic changes of the face and the morpho-functional state of the jaws: the following research methods will be used in the course of the work: - General clinical and biochemical blood tests; -Aesthetic assessment of

the face with anthropometry; - X-ray examinations: MSCT, tele-roentgenograms (in fas, profile) with cephalometry, zonograms of the middle zone of the face, ONP radiographs; - Statistical methods of processing the results obtained. The content of inorganic filler (SiO_2) is 8%, the particle size is 0.6–0.8 microns. Orthodontic structures were manufactured using gypsum-based light-curing technology with preliminary polymerization in the Heralight apparatus (Heraus Kulzer) and final polymerization in the Heraflash apparatus (Heraus Kulzer) [8-14]. All materials were polymerized at the cycle parameters specified by the manufacturer. After the gypsum was removed, each mechanically functioning orthodontic apparatus consisting of a base material and metal elements was treated and polished with a muslin polishing wheel using pumice stone with water, after which a polishing paste was applied to a glossy sheen. Statistical processing was carried out on a computer using the program "Microsoft Excel" and the package of application programs "Statistica 6.0". The data are presented as mean and standard deviations for a normal distribution and as median and interquartile range for a distribution other than normal. The significance of the differences for 80 quantitative variables between the groups was assessed by the Wilcoxon and Mann- Whitney criterion. The differences were considered statistically significant at $p<0.05$. [15-21].

Results of the Research

As a result of the examination of patients in the control group, it was found that the variability of the rate of secretion of HPV ranges from 3.12±0.15 to 3.20±0.16 ml/10 min. The average value (3.16±0.15 ml/10 min) was taken by us as a conditional norm, which optimally characterizes the rate of secretion of non-stimulated mixed saliva in children.

Conclusions

Thus, a comparative analysis of the biophysical parameters of V Международный конгресс стоматологов 20 LVH in children makes it possible to objectively and reliably assess the adequacy of adaptive reactions at the stages of orthodontic treatment. The analysis of the adaptation parameters according to the biophysical parameters of NRH allows us to assert that almost complete restoration of homeostasis when using removable orthodontic structures made of basic materials of cold, hot and light polymerization occurs by the 60th day from the moment of hardware treatment. It is proved that adaptation to removable orthodontic equipment made of basic materials for the biophysical indicators of NRH includes two periods (phases). The first phase (from the moment of application until the 14th day) is expressed by an increase in volume, the rate of HPV, and a shift in pH to the alkaline side with a decrease in the viscosity parameters of mixed saliva.

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