DOCTORAL THESIS ABSTRACT

The doctoral thesis entitled „***The Implications of Metabolic Diseases in the Etiology and Clinical Features of Dento-Maxillary Anomalies”,*** addresses an interdisciplinary topic with well-defined practical applications, highlighting the relationship between the oral cavity changes occurring in patients with type 1 diabetes mellitus and the rate of dento-periodontal remodeling following orthodontic therapy.

The general part of the thesis includes a description of one of the most common metabolic diseases, diabetes mellitus, with an emphasis on its etiological factors and the possibilities for prevention and treatment in adults and children. A dedicated chapter addresses the methods for assessing dental age using the Demirjian technique, in correlation with the metabolic disturbances induced by diabetes mellitus.

Type 1 diabetes mellitus is one of the most common chronic diseases of childhood, which can be diagnosed at any age, with implications for general as well as craniofacial development. It is widely speculated that diabetes occurs when inherited genetic traits are triggered by environmental factors. The most frequent oral manifestations are dental caries, inhibition of salivary secretion, and oral mucosal diseases such as glossodynia, lichen planus, candidiasis, xerostomia, recurrent aphthous stomatitis, dry mouth syndrome, and, most importantly, gingivitis and periodontitis. Periodontal disease, in turn, is a chronic gum disease usually caused by poor oral hygiene, leading to periodontal inflammation and, ultimately, to destruction of the periodontal ligament and subsequent bone loss.

The second part of the thesis, ***„Personal Contributions“***, is concerned with the analysis of the effects of diabetes mellitus on dento-maxillary status.

The first study of the personal research focuses on evaluating the effects of diabetes mellitus on dento-maxillary status, from the perspective of feedback provided by responding dental practitioners in a cross-sectional clinical-statistical study based on a 14-item questionnaire, distributed by e-mail and social media.

The second study analyzes the correlations between fixed orthodontic therapy and tooth movement in patients with diabetes. It is a recent literature review that provides important data on tooth movement in diabetic patients, as well as on the possibilities for reducing adverse effects during fixed orthodontic therapy. The placement of orthodontic appliances in the oral cavity

creates retentive surfaces that favor biofilm development and the proliferation of cariogenic and periodontopathogenic bacteria. In addition, the forces generated by orthodontic archwires can cause internal or external root resorption and areas of bone destruction. Interdisciplinary collaboration is essential, both for establishing the prognosis of diabetes and for calibrating the force applied to the teeth of an insulin-dependent patient.

The third study of the personal research is dedicated to evaluating differences in dental age among children with type 1 diabetes mellitus using the Demirjian method. Dental age is considered a reliable and reproducible marker of developmental stage. Dental maturation, assessed through tooth mineralization, follows a continuous, genetically regulated process that is comparatively less susceptible to environmental fluctuations than other maturity indicators. This relative stability makes dental age particularly valuable in children affected by systemic conditions, where other growth indicators may be altered or less reliable.

The results of this study show that pediatric patients with type 1 diabetes mellitus exhibit advanced dental maturation compared with their healthy peers, reflected in a higher dental age relative to chronological age. Glycemic control, assessed by HbA1c, was significantly associated with advanced dental age, suggesting a possible independent relationship with dental maturation.

The results obtained within the studies were interpreted with reference to the data available in the specialized literature, and the corresponding conclusions were synthesized and presented at the end of each study.

The doctoral thesis entitled: ***"The Implications of Metabolic Diseases in the Etiology and Clinical Features of Dento-Maxillary Anomalies"***, brings new elements by establishing correlations between a disease that is increasingly widespread among the current generations of children, diabetes mellitus, and the management of oral cavity conditions, including the treatment of dento-maxillary anomalies. Selecting the optimal timing of therapy according to the degree of dental maturation established through the Demirjian method is of critical importance in clinical practice, as it can help anticipate the progress of therapy and post-orthodontic stability.