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Hygienic condition of the oral cavity during orthodontic treatment of children with temporomandibular joint dysfunction

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Abstract

Orthodontic treatment was carried out using mechanically activated devices and devices of mixed action, which were obtained in accordance with the diagnosis. In the main group, tartar was detected in 73.3%, and in the control group - in 46.6%. In children with malocclusion and dysfunction of the temporomandibular joint, the value of the PMA (papillo-marginal-alveolar) index in periodontal tissue and the hygiene of the oral cavity were evaluated using the Schiller-Pisarev test. He substantiated the need for preventive measures before and during active treatment using orthodontic appliances.

Keywords: temporomandibular joint, occlusion, oral cavity, hygienic condition.

Introduction

The temporomandibular joint is a three-directional movable receptor organ associated with the proprioceptors of periodontal, chewing muscles and transmitting information to the central nervous system about the position of the lower jaw to control and regulate chewing movements [I. Alabin, V. V. Mitrofanenko, 2002; Lebedenko I.Yu., Kalivrajyan E.S., 2011].

As a rule, signs of TMJ pathology begin to be seen in patients from the age of 14. In children and adolescents of a younger age with dentoalveolar anomalies, cases of initial signs of joint function deviation are single, with the exception of systemic diseases [Bulycheva E. A., 2007; Ivashenko P.I., 2009; Silin A.V., 2007; Semenyuk V.M., 2003; Khvatova V.A., 2004] [2].

However, other scientists do not associate the development of TMJ diseases with malocclusion [Panteleev V. D., 2011; Yap A. U., 2002]. They believe that the main component of the development of TMJ disease is infection, trauma, metabolic disorder, prolonged spasm of chewing muscles.

Ivashenko P.I. *et al.* (2007) found that in patients with connective tissue dysplasia and internal disorders of the temporomandibular joint, catabolic processes predominate in the tissues, chronic inflammation with a pronounced productive component, manifested by edema of the connective tissue, perivascular infiltrates, homogenization of collagen fibers, hyalinosis, is diagnosed sclerosis, which causes a more severe course of the disease due to obliteration of blood vessels, deterioration of trophism of the capsular-ligamentous apparatus. The consequence is a more dynamic development of the pathological process, the occurrence of complications such as osteoarthritis, synovitis, the rapid appearance of irreversible deformations in the temporomandibular joint.

Persin L.S., Sharov M.N. (2013) consider that the main causes of disorders of the temporomandibular joint function are: anomalies of occlusion of the dentition - 65–70%; muscle dysfunction of the maxillofacial region - 15–20%; neuropsychiatric disorders - 10–15%, and only in 5% of patients dysfunction of the temporomandibular joint is associated with the joint disease itself.

Purpose of research

Assessment of the hygienic condition of the oral cavity and periodontal tissues in children with malocclusion and dysfunction of the temporomandibular joint based on studies.

Object and Research methods

Before the start of orthodontic treatment in children with malocclusion and dysfunction of the temporomandibular joint, extensive clinical examinations were conducted. In order to study and identify children at risk of developing diseases of the temporomandibular joint in 2018–

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2020, we performed outpatient treatment at the Bukhara Regional Dental Clinic and at the Dental Training and Research Center of the Bukhara State Medical Institute. Of the 202 children who applied with various anomalies, 45 were included in our main group.

Clinical examinations were carried out using a standard set of dental equipment according to the general rules: interrogation, examination, examination of the mucous membrane of the oral cavity, teeth and dentitions, periodontal tissues, chewing muscles, examination of the temporomandibular joint. During the survey, in addition to general information about the age, lifestyle, dietary characteristics of patients, information about hereditary and existing common somatic diseases, injuries of the tooth area, bad habits, the duration of tooth extraction and replacement is taken into account. Premature loss of primary teeth and the time of tooth extraction and its causes have been determined. The study of soft tissues focuses on the red border of the lips, tongue, lips, mucous membrane of the cheek, gums, periodontal margin, depth of the oral cavity, combination of frenum of the tongue and lips, buccal folds, position and size of the palate. When opening and closing the mouth, the normal movement of the lower jaw, the movement of the head of the joint and the location in the joint cavity were evaluated. The contact of the dentition in the sagittal, vertical and transverse directions was evaluated. Dynamic tests (breathing, speech, swallowing) were performed during functional diagnostics. According to the instructions, clinical functional tests of Ashler-Bitner, Ilyino-Markosyan were conducted.

After a clinical examination, children were prepared and installed orthodontic appliances, conducted hygienic training and recommendations were given for the care of orthodontic appliances. Orthodontic treatment was carried out using mechanically activated devices and devices of mixed action, which were obtained in accordance with the diagnosis. Children of the main group used these devices during the day, myofunctional simulators (LM activator) at night.

The results of the initial study of the hygienic state of the oral cavity and the condition of periodontal tissues in children with malocclusion and dysfunction of the temporomandibular joint are presented in.

Table 1: Hygienic status of the oral cavity and periodontal tissues before orthodontic treatment in children with malocclusion and dysfunction of the temporomandibular joint

Control groups indicator	PMA%	Schiller-Pisarev test	Bleeding	Tooth stones	CPITN
The main group (n = 45)	29,11± 1,79	1,66± 0,05	0,44± 0,07	0,26± 0,04	0,73± 0,04
Control Group (n = 15)	14,01± 2,04	1,08± 0,16	0,155± 0,04	0,17± 0,02	0,31± 0,1

The data presented in this table show that the initial hygiene status in children assigned for orthodontic treatment in children with malocclusion and dysfunction of the temporomandibular joint was "unsatisfactory", and no statistically significant differences in quantitative and qualitative indicators were revealed. In children with tooth abnormalities and temporomandibular joint dysfunction, the value of the PMA index (papilla-margin-alveolar process) in periodontal tissue and inflammatory changes in the Schiller-Pisarev test differ more clearly and reliably with the corresponding data from a practically healthy group. Symptoms of bleeding in the main group of children were

observed in 29 people in 65% of cases. Dental calculi were detected in 73.3% in the main group and in 46.6% in the control group. In the control group, calculus of the gums was detected in 8 children, which amounted to 53.3%. Children in the main group also had to undergo professional oral hygiene, which, according to the CPITN index, included the study of hygiene skills, motivation and control of "professional" toothbrushing. According to the CPITN index, the need for these measures in the main group was 82.2%, in the control group - 60%. The dynamics of changes in hygiene indicators reflecting the state of periodontal tissues was determined as an evaluation criterion for orthodontic treatment.

The results of a clinical examination of children with malocclusion and dysfunction of the temporomandibular joint 6 months after the start of orthodontic treatment are presented in

Table 2: Hygienic status of the oral cavity and periodontal tissues after 6 months of orthodontic treatment in children with malocclusion and dysfunction of the temporomandibular joint

Control groups indicator	PMA%	Schiller-Pisarev test	Bleeding	Tooth stones	CPITN
The main group (n = 45)	15,5± 0,61	1,2± 0,03	0,13± 0,05	0,04± 0,01	0,19± 0,04
Control Group (n = 15)	13,3± 1,03	1,0± 0,08	0,13± 0,05	0,05± 0,02	0,19± 0,05

The numerical data in the table show a tendency to an increase in hygiene and periodontal indicators in all patients. Symptoms of gingivitis were reliably diagnosed ($P < 0.01$) compared with the data of the control group and the initial group with increased readings of PMA and the Schiller-Pisarev periodontal test. There were no significant differences in the results of the Schiller-Pisarev test in the main group and the healthy group of children with tooth abnormalities and temporomandibular joint dysfunction. In the main group of children, signs of gum bleeding were found in 24.4% of cases. Gum stones were found in 15.5% of the children of the main group.

Conclusion

Professional oral hygiene was carried out in all groups of children: motivation using the Clear Dentistry program, training in individual oral hygiene, professional toothbrushing using instrumental dental calculus, and the selection of hygiene products and methods. The presented data justifies the need for preventive measures before the start of active treatment using orthodontic appliances and during treatment.

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