Impact Factor:					
	ISRA (India) = 4.971	SIS (USA) = 0.912	ICV (Poland) = 6.630
	ISI (Dubai, UAE) = 0.829	РИНЦ (Russia) = 0.126	PIF (India) = 1.940
	GIF (Australia) = 0.564	ESJI (KZ) = 8.997	IBI (India) = 4.260
	JIF = 1.500	SJIF (Morocco) = 5.667	OAJI (USA) = 0.350

SOI: 1.1/TAS DOI: 10.15863/TAS

International Scientific Journal

Theoretical & Applied Science

p-ISSN: 2308-4944 (print) **e-ISSN:** 2409-0085 (online)

Year: 2020 **Issue:** 07 **Volume:** 87

Published: 30.07.2020 **http://T-Science.org**

QR – Issue QR – Article

Sunnatullo Amrulloevich Gafforov
The Tashkent Institute for Advanced Training of Doctors
Head of the Department of
"Dentistry, Pediatric Dentistry and Orthodontics" of
Doctor of Medical Sciences, Professor

Gavhar Anvarovna Fazilbekova
Tashkent Institute of Advanced Medical Education
Assistant of the Department of Dentistry
Pediatric Dentistry and Orthodontics

A SCIENTIFIC VIEW OF THE PROBLEM OF TREATMENT AND PREVENTION OF DENTAL ANOMALY IN CHILDREN WITH DISEASES OF BRONCHIAL ASTHMA (REVIEW ANALYSIS OF THE LITERATURE)

Abstract: *The data from the literature of recent years devoted to the study of the foundations of diseases in dentoalveolar anomalies and deformities in children and adolescents with bronchial asthma, methods of its diagnosis, prevention and treatment are analyzed. It was established that the study of the dental status, the state of nonspecific resistance and the level of functional reactions that provide homeostasis of the oral cavity and adaptive capabilities in children with dentoalveolar anomalies and concomitant bronchial asthma was insufficiently studied and reducing the risk of developing traumatic stomatitis in children with bronchial asthma.*

Key words: *children and adolescents, oral cavity, bronchial asthma, dentoalveolar anomalies and deformities, diagnosis, treatment, prevention.*

Language: *English*

Citation: Gafforov, S. A., & Fazilbekova, G. A. (2020). A scientific view of the problem of treatment and prevention of dental anomaly in children with diseases of bronchial asthma (review analysis of the literature). *ISJ Theoretical & Applied Science, 07 (87),* 424-431.

Soi: http://s-o-i.org/1.1/TAS-07-87-81 ***Doi***: https://dx.doi.org/10.15863/TAS.2020.07.87.81

Scopus ASCC: *2700.*

Introduction

Currently, all over the world, including in Uzbekistan, there is an unfavorable tendency of an increase in the level of dentoalveolar anomalies and deformities in children and adolescents due to an increase in the frequency of diseases of background pathology such as respiratory organs, allergopathology, gastrointestinal, endocrine, cardiovascular diseases [18, 27, 32, 36, 38].

According to a number of literature data, the frequency of dentoalveolar anomalies and deformities in the child and adolescent population is contradictory, which is explained by the ecological, geochemical, and social characteristics of the regions. The prevalence of dentoalveolar anomalies in children and adolescents, according to the authors, ranges from 18.9 to 86.1% [1, 36, 38].

At the same time, it should be noted that the frequency of dentoalveolar anomalies significantly increases (from 43.4 to 73.6%) in persons with other dental diseases, such as caries, periodontal disease [28, 36].

II.Literature review

Attention is drawn to the tendency for the growth of disorders in the dentoalveolar system at different age periods, with a significant increase in the frequency of dentoalveolar anomalies in both children and adults over the past 15–20 years [39], as well as the analysis of genealogical information about

probands and their parents. on the basis of "bite" indicates that the generation of children has more pronounced malocclusion than their parents [16, 39], these facts demonstrate the social significance of the problem - almost every 2/3 of the child in the world has morphofunctional deviations in the dento-facial area.

We know that unfavorable environmental factors negatively affect the general health of people, including children, reducing the level of both somatic and dental health [12, 25, 26].

When studying the frequency of dentoalveolar anomalies in children with different levels of health, scientists reveal etiopathogenetic links between various diseases of the body and the formation of pathological disorders in the dentoalveolar system [21, 26].

III.Analysis

The mechanisms of the development of dentoalveolar deformities in the pathology of ENT organs (adenoid vegetation, tonsillitis, hypertrophic changes in the turbinates, seasonal rhinitis, curvature of the nasal septum) are most fully disclosed, where orofacial dysfunctions are the leading factor. Violations of myodynamic balance, functional activity of the muscles of the maxillofacial region adversely affect the growth and development of the jaws, the shape and size of dental arches and their relationships [3, 35, 36, 37, 50]. In addition, it was found that diseases of organs and systems in children and adolescents are combined with an increase in the frequency of dentoalveolar anomalies and deformities as in disorders of the musculoskeletal system [7, 23, 27], endocrine diseases [21], diseases of the cardiovascular system [13], allergic pathology [2]. For example, the author with his research established the relationship between the state of the dentition and the respiratory systems, and he also observed dentoalveolar anomalies in children with bronchial asthma in 89.3% of cases; also in the study of cephalometric and biometric parameters in children with bronchial asthma and allergic rhinitis showed that in this category there is a narrowing of the dental arch in the molar region, lengthening of the anterior segment of dental arches, retrusion of the lower incisors, retrognathia of the mandible [2, 36].

The authors found that 92.1% of children and adolescents with dentoalveolar anomalies have from 2 to 5 concomitant somatic diseases; the interrelation and interdependence of morphological and functional disorders in the dentition in children and adolescents with pathological changes in the body allows us to consider dentoalveolar anomalies as a socially significant combined pathology [36, 38].

However, an analysis of the literature data showed that the state of the dentition in children with bronchial asthma, a disease that is one of the central problems of pediatrics, has not been sufficiently studied. An in-depth analysis of the dependence of the frequency and structure of dentoalveolar anomalies in children and adolescents with bronchial asthma on the age of the dentition, duration and severity of the underlying disease is required. This means that the prevalence of clinical forms of dentoalveolar anomalies and deformities in this category must be specified, including a multifactorial assessment of epidemiological parameters characterizing the dental status in children with bronchial asthma and dentoalveolar anomalies.

As far as we know, bronchial asthma (BA) is currently one of the central problems of pediatrics in all countries of the world (Noncommunicable Diseases - NCDs); this is due to a distinct increase in the incidence of the disease, its severity, adverse effects on the growth and development of a child, a tendency to relapse, and a tendency to early disability in children [9, 13, 23]. According to the authors, in some countries, bronchial asthma suffers from 1 to 18% of the population, with an increase in the incidence in recent years by 2–2.5 times [6, 47].

Moreover, the incidence of patients with pathological changes in the oral cavity caused by concomitant chronic somatic pathology at outpatient dental appointments showed that patients with bronchial asthma took the second place in the number of visits for dental pathology; they had periodontal diseases in 100% of cases[5]. Also, it was found that in bronchial asthma there are changes in the immune, endocrine, bone, nervous systems, different parts of the gastrointestinal tract [9, 24].

According to a number of authors, in allergic pathology, immunological reactivity changes, protein and mineral metabolism is disturbed, tissue hypoxia develops, the body's resistance decreases, which affects the dental status of patients [23, 25, 36]; and also, in case of bronchial asthma, an increase in the frequency of the main dental diseases in children was revealed: caries and non-carious lesions of hard tooth tissues, pathology of periodontal tissues and oral mucosa are widespread[41]; According to the author, it has been demonstrated that children 3-6 years old with bronchial asthma have a higher prevalence of caries than healthy children, mouth breathing is more common, it has been established that adolescents 12-16 years old with bronchial asthma have a high risk of developing caries in correspondence with karyograms [47].

The highest prevalence of dental caries is observed in children with a severe form of the disease, reaching 96.4%, in children with a moderate form of bronchial asthma, this figure is 83.4%, with a mild form - 71.5% ($p < 0.05$). In children with severe bronchial asthma, focal demineralization of enamel is detected in $30.2 \pm 0.13\%$, with moderate - $27.8 \pm 0.21\%$, with mild - $24.4 \pm 0.18\%$. In children with a severe form of bronchial asthma, the intensity of tooth decay is maximum and is equal to $9.2 \pm 0.33\%$, while

in children with a moderate form - 7.3 ± 0.06%, with a mild form - 5.1 ± 0.28% [19]; another author, determined in patients with bronchial asthma the intensity of caries in the period of permanent occlusion - 92.9%; non-carious lesions of the teeth - 72.3%; inflammatory periodontal diseases - in 100%; swelling of the tongue in 30%; petechiae of the oral mucosa in 70% and dry lips in 55% [22].

According to the authors, disorders in the dentition in children with bronchial asthma can be caused by structural and functional changes in the skeletal system, which are interrelated [4, 12]; all the more, the study of bone mineral density in patients with bronchial asthma showed that the bone in these patients is affected by pathological processes that take place in this disease, and the severity of such changes increases with the severity of bronchial asthma [11]; and also, long-term treatment with inhaled glucocorticosteroids in children with bronchial asthma leads to the development of osteopenia and osteoporosis, an increase in the level of parathyroid hormone and a decrease in the content of osteocalcitonin [3].

High rates of dental caries in children with allergic pathology, this is associated with a decrease in the mineralizing potential of saliva and low caries resistance, and a significant prevalence and intensity of these pathologies in children with bronchial asthma is combined with changes in saliva parameters [17, 47], it was also revealed that during remission the value The average pH is 6.28, and during the exacerbation it is 6.11 [24].

According to the study, it was determined that in children with allergic pathology, the level of oral hygiene is significantly lower than in healthy children, this is due to the unsatisfactory hygienic state of the oral cavity in this category of children, not only with insufficient skills and irregular cleaning of teeth, but also with a decrease in the rate of salivation and violation of the protective properties of saliva, which creates conditions for the reproduction of microorganisms in the oral cavity [2]; for the treatment of bronchial asthma with the use of inhaled drugs, the pH of which has a level of less than 5.5, reduces the pH of dental plaque; this, together with a decrease in the rate of salivation, a decrease in the content of amylase and Ig A in saliva, adversely affects the level of dental health of children suffering from bronchial asthma [47].

At the same time, the author argues that, despite the fact that children with bronchial asthma, for the treatment of which beta-2-agonists are used, are at risk of developing caries, the effect of these drugs on salivation and on the level of tooth caries resistance is questioned [42]; thirdly, the author argues that, although in children and adults with bronchial asthma, the rate of salivation decreases, but with a good level of oral hygiene, this does not affect the occurrence of dental caries [43]. We know that the cellular elements of nonspecific protection of the oral cavity are a group of antigen-presenting cells and polymorphonuclear neutrophils, as well as some subpopulations of T-lymphocytes, and it is they that perform the function of phagocytosis and elimination of utilized cells; secretion of biologically active substances. Macrophages produce several inflammatory amplification factors or chemotaxis for inflammatory agents. Polymorphonuclear neutrophils, being microphages, also trigger a chain of redox reactions.

IV.Discussion

The cellular elements of specific immune reactions of the oral mucosa and pharynx include T- and B-lymphocytes, plasma cells and tissue basophils. Depending on their specialization, T-lymphocytes are capable of either multiplying the local immune response to the appearance of an antigen, or directly destroying the foreign agent itself. Plasmocytes and B-lymphocytes synthesize and secrete various classes of immunoglobulins, but they are effective only in the presence of Antigen-presenting and T-helpers [15, 22]. In the secretions of the body, sIgA binds to bacteria and viruses, thereby blocking their adsorption and adhesion to the mucosal epithelium and preventing the penetration of pathogens into the internal environment of the body.

In addition, it has a high resistance to proteases, which makes it possible to function in the secretions of the mucous membranes; lack of the ability to bind complement components, which excludes the damaging effect of the antigen-antibody complex on the mucous membranes. The number of immunocompetent cells synthesizing sIgA changes with age. Their number is minimal in children, which makes this category of children extremely susceptible to bacterial and viral infections.

It has now been established that the mechanism of development of bronchial asthma is associated with disturbances in the normal balance between T-helpers (Th) type 1 and 2 [22, 31, 36], and it is also known that Th 1 produce interleukin-2 (IL-2), interferon-γ, tumor necrosis factor (TNF) α, while Th2 - IL-4, IL-5, IL-10, IL-13 [49]. Therefore, many authors consider inflammatory diseases of the oral mucosa and periodontal disease in bronchial asthma from the standpoint of a single immune-inflammatory nature of occurrence, affecting both the oral cavity and the respiratory tract.

The study of the dental status and immunoregulatory mechanisms in children with bronchial asthma demonstrated a high degree of prevalence and intensity of the carious process in combination with lesions of the oral mucosa. At the same time, pronounced changes in the salivary cytokine spectrum were determined: an increase in the levels of cytokines: interleukin-4 (IL-4), interferon-γ (TNF-γ), interleukin-6 (IL-6) [19, 24]. A decrease in the barrier functions of the oral mucosa in patients

with bronchial asthma to the effects of microflora and other pathogenic factors has a significant effect on the development of inflammatory changes in the tissues of the periodontium and the oral mucosa. Also, it has been proven that the development of dental pathology is associated with a microbial factor. Among the microorganisms that cause the development of caries in children with allergies, the leading destructive role is played by Str. Mutans and Lactobacilus [13].

For patients with bronchial asthma in the acute period of the disease, polymicrobial infection of the oropharynx is characteristic. Bacteria are secreted from the mucous membrane of the back of the pharynx, which are practically not detected in this area: enterobacteria, pseudomonas, acinetobacters. The frequency of isolation of gram-negative non-fermenting bacteria is 1.50-3.08%, enterobacteria - 38.5%. Against the background of a decrease in the frequency of detection of species characteristic of healthy children, there is an increase by 2-5 orders of magnitude in the number of gram-negative non-fermenting bacteria and enterobacteria of the following species: E. coli, Proteus mirabilis, P. vulgaris, K. pneumoniae, K. ozaenae, Enterobacter aerogenes, Pseudomonas aeruginosa , Burkholderia cepacia, Acinetobacter haemolyticus [38]. It was also found that in children with bronchial asthma, taking inhaled glucocorticoids, the state of hard tissues of teeth, periodontal tissue and salivary mineralizing function are disturbed, as a result, children with bronchial asthma are at risk of developing caries, non-carious lesions, periodontal tissue diseases, candidal stomatitis [48]. On the part of another author, a decrease in the natural nonspecific defense in the oral cavity, a high frequency of candidiasis and a significant contamination of the oral mucosa with Candida fungi in patients with bronchial asthma who used inhaled and systemic glucocorticoids, especially daily [24, 38,45], were revealed. The author's studies have shown that the elemental imbalance in this category of children is associated with a deficiency in the content of blood iodides, insufficient content of copper, lithium, selenium, zinc and iron, and excessive accumulation of cobalt and lead [15]. Copper deficiency is also associated with immunodeficiency. Copper is of great importance for maintaining the elasticity of blood vessel walls, being a cofactor of superoxide dismutase (SOD), it is present in the human antioxidant defense system, increases the body's resistance to certain infections, binds microbial toxins [12]. Thus, when carrying out health-improving measures in children with bronchial asthma, it is necessary to take into account the importance of violations of the microelement link of homeostasis in the development of the pathological condition under consideration, since an imbalance of minerals leads to depletion of antioxidant defense reserves, accumulation of endogenous toxins, a decrease in cell-phagocytic defense, a decrease in the ability to produce antibodies in response on the impact of foreign agents.

Today, in dental practice, the leading method in the complex treatment of dentoalveolar anomalies and deformities is the hardware method, which is carried out using removable and non-removable structures. Under the influence of orthodontic appliances, complex processes of bone modeling, changes in the tissues of the periodontal complex, in the structures of the temporomandibular joint occur [20, 36].

Orthodontic treatment must be considered from the perspective of not only local effects, but also the effect on the body as a whole, because, by the intersystem integration of the functional state of the dentoalveolar systems and the autonomic nervous system, as well as the cardiovascular and respiratory systems, therefore, changes in the dentoalveolar-facial complex have an effect on the functional state of the whole organism [10, 20, 26].

Also, it was found that the level of a child's somatic health predetermines both the nature of adaptive reactions at the beginning of orthodontic treatment, the balance of tissue transformations in the active phase, and the stability of the results in the retention period. According to the author, the nature of adaptive reactions in the treatment of dentoalveolar anomaly depends on the level of specific and nonspecific resistance of the child's body. For example, in children with a high body resistance, pronounced adaptive reactions are determined at the first stages of treatment; it is noted that in cases of using removable devices, the normalization of physiological parameters is observed at a later date than non-removable ones; and with a decrease in the body's resistance, the adaptation period is longer, and later the level of functional reactions in the oral cavity is not restored to its original values [29].

Based on the above, analysis of literature data indicates that the use of removable orthodontic appliances, which are a stress factor for the tissues of the prosthetic bed and the child's body, provokes the development of not only physiological adaptive reactions, but also negative changes in the tissues of the periodontium and the oral mucosa [34]. The authors found that removable orthodontic appliances violate local homeostasis by changing the quantitative and qualitative parameters of the oral fluid [14, 34]. An analysis of the biophysical parameters of unstimulated oral fluid (UOF) showed that adaptation to removable orthodontic appliances made from basic materials includes two phases: 1 - from the moment of application to the 14th day; It is expressed by an increase in the volume, speed of unstimulated oral fluid, a shift in pH to the alkaline side with a decrease in the viscosity parameters of mixed saliva: 2 - phase - from 14 to 60 days; associated with almost complete recovery of the initial biophysical parameters of unstimulated oral fluid [14]. Also revealed a decrease in the level of lysozyme by 30%, an intensification of

lipid peroxidation and a deficiency of the physiological antioxidant system, an increase in proteolytic activity during orthodontic treatment. As a result of increased antigenic load, an increase in the content of S-Ig A in saliva was determined [20, 26].

It has been established that cytomorphological changes in the gums were revealed in those undergoing apparatus treatment [16]; a decrease in the content of keratinized anucleated cells - by 1.4 times, nucleated cells of the spinous layer - by 1.1 times; an increase in the content of cells with symptoms of cytopathology: with a deformed nucleus - 3.2 times, contaminated with microorganisms - 2.7 times, with symptoms of phagocytosis - 11 times; an increase in the number of cells of the inflammatory infiltrate: polymorphonuclear leukocytes - by 2.5 times, naked monocytes - by 2.2 times, intact monocytes - by 1.7 times; an increase in the value of the inflammatory-destructive index by 3.9 times.

The use of removable orthodontic structures worsens the hygienic condition of the oral cavity, changes the microbial landscape in the cavity, adversely affects the trophism and microcirculation in the tissues of the periodontium, the mucous membrane of the prosthetic bed; an increase in microbial contamination by 50 -67% and an increase in the frequency of excretion of opportunistic and pathogenic microflora [33]. Another factor contributing to inflammatory-reactive changes in the periodontal tissues and the oral mucosa are acrylic plastics, a widely used material from which lamellar devices are made.

In recent years, there has been convincing evidence that different plastics used in dentistry differ in the content of toxic and potentially allergenic substances [16, 34]. For example, acrylates affect the structural and functional properties of the cell membranes of the oral mucosa, change the ionic composition of saliva; when using devices made of "Redont" material in children, the pH of the oral fluid is 6.05, the level of potassium decreases, and the level of calcium in the mixed saliva increases [29]. It was found that at the initial stage of orthodontic treatment with devices made of basic cold-curing plastics, there is a significant increase in the concentration of iron, tungsten, the gradient of the ratio "copper / zinc", as well as IgE. And also, the authors determined that with orthodontic treatment of children with removable structures, the prevalence of chronic catarrhal gingivitis is 100%, chronic hypertrophic gingivitis - 18.18%. At the same time, the change in the function of the salivary glands is manifested in a significant decrease in the salivation rate by 29.17%, the level of sIgA by 1.85 times and lysozyme by 1.33 times in the oral fluid compared with children in the control group without dentoalveolar anomalies [14].

Special tactics of orthodontic treatment are required by patients with general diseases of the body, especially those with allergic pathology due to the high risk of complications, especially in this category of patients there are relative contraindications to the use of constructions made of acrylic plastics, which can trigger allergens [44]. At the same time, the analysis of literature data showed that the issues of the effect of removable orthodontic appliances on the periodontal tissue, the oral mucosa in children with bronchial asthma have not been sufficiently studied.

Domestic and foreign authors are unanimous in the opinion: the priority in the prevention of dental diseases at the stages of orthodontic treatment is to ensure a high level of oral hygiene [20, 25, 26, 40]. For example, the comparative assessment of the effectiveness of the use of electric and manual toothbrushes in patients undergoing instrumental treatment is ambiguous. The author prioritized the use of an electric toothbrush in the course of orthodontic treatment [46], another authors did not determine the differences in the levels of hygienic state of the oral cavity when using electric and manual toothbrushes [S. Deriy 2004]. Also, other authors, for the prevention and treatment of pathological reactive changes in the mucous membrane of the prosthetic bed in children, recommend the use of therapeutic and prophylactic anti-inflammatory toothpastes and conditioners-conditioners "Parodontax", "Lakalut active", "Korsodil" and "Vesna Plus" [30] , for orthodontic patients, he recommends a double brushing of teeth with the use of toothpastes, which had pronounced anti-inflammatory properties and antioxidant effect, and as a rinse, it is proposed to use dental elixirs with a biogenic stimulant of a wide spectrum of action - the preparation biotrit, which is obtained from wheat seedlings [29].

In order to objectify the prognostic signs of the development of complications in orthodontic treatment, an interactive computer program has been developed for their determination, and also, the concept of differentiated individualized use of complexes for the prevention of diseases of hard dental tissues, oral mucosa and periodontal tissues during orthodontic treatment has been proved [8], other authors have established on the need for a differentiated approach to preventive measures taking into account the degree of risk of caries and periodontal diseases when using removable orthodontic appliances (20).

V.Conclusion

Thus, the analysis of the literature data showed that the dental status in children with dentoalveolar anomalies and concomitant bronchial asthma, as well as the state of nonspecific resistance and the level of functional reactions that provide oral cavity homeostasis and adaptive capabilities in this contingent, have not been sufficiently studied, a treatment and prophylactic scheme has not been developed. measures that improve adaptation to removable and non-removable devices and reduce the

risk of developing traumatic stomatitis in children with bronchial asthma, and also insufficiently substantiated by experimental studies of the etiopathogenetic mechanisms of pathological processes of the oral mucosa and periodontal tissue undergoing orthodontic treatment in children with bronchial asthma.

References:

1. Averyanov, S.V. (2010). *The concept of etiology, pathogenesis and prevention of dentoalveolar anomalies in the child population living in the zone of ecological disadvantage: author*. dis. ... Dr. med. (p.46). Perm.
2. Admakin, O.I. (2006). Results of the program for the prevention of dental diseases in groups of children with allergic pathology. *Questions sovr. pediatrics*, No. 5, p.12.
3. Arsenina, O.I. (2013). The use of elastopositioners in the program of prevention and early orthodontic treatment of children 4-12 years of age / *Stomat. children age and prof.* 2013. T. 12, No. 2 (45), p. 41–49.
4. Atrushkevich, V.G. (2007). Osteoporosis in the clinic of periodontal diseases // *Ros. machine. zhurn.*. No. 5, pp. 42–45.
5. Babenya, A.A. (2012). The frequency of detection of pathological changes in the oral cavity in patients with somatic diseases at outpatient dental appointments / *Visnik stomatol*, No. 1, pp. 25–27.
6. Belevsky, A.S. (2012). Global strategy for the treatment and prevention of bronchial asthma: revision of 2011. (p.107). Moscow: Ros. respirator. ob-vo.
7. Bimbas, E.S. (2012). Interrelation of transversal anomalies of occlusion with violations of motor stereotypes / *Stomatol. children age and prof.* 2012. T. XI, No. 3 (42), pp. 19-24.
8. Bida, O.V. (2008). *Prediction and prophylaxis accelerated in orthodontic treatment of ailments due to the lack of knowledge and ignorance of technology*: author. dis. ... Cand. honey. Sciences: / Nat. honey. acad. a diploma. insight into im. P.L. Shupika. K., p.17.
9. Bogovin, L.V. (2013). *Psychological characteristics of patients with bronchial asthma*. (p.248). Vladivostok: Dalnauka.
10. Bugrovetskaya, O.G. (2010). Interrelation of the functional state of the dentoalveolar and autonomic nervous systems. *Manual. therapy*. 2010. No. 2 (38), pp.18–23.
11. Gadzhiev, K.Z. (2006). *Bronchial asthma: osteoporosis, factors that affect its development, and evaluation of the effectiveness of treatment*: author. dis. ... Cand. honey. Sciences: / (p.20). Moscow.
12. Gafforov, S.A., Olimov, S.Sh., Saidov, A.A., & Shamsutdinova, F.T. (2006).*"Dental status of workers in the main industries of Uzbekistan"* Monograph. Nat. Encyclopedia of Uzbekistan. (p.208). Tashkent.
13. Goncharenko, A.S. (2005). Dental status of children with hereditary rickets-like diseases / *Med. genetics.*, T. 4, No. 4, p.102.
14. Domenyuk, D.A. (2015). Assessment of adaptive processes when using removable orthodontic appliances in children: (biochemical aspects) / *Stomatol. children age and prof*., V. 14, No. 1, pp.17–22.
15. Evseeva, G.P. (2009). Changes in the microelement status in children with bronchopulmonary pathology in the Amur region // *New med. technol. New honey. equip*. , No. 3, pp.5–8.
16. Elizarova, I.V., & Maslak, E.E. (2005). Hygiene and periodontal condition in children undergoing orthodontic treatment. *Act. question experimental, wedge and profilact. stomatol*. Volgograd, T. 62, issue. 2, pp. 127–133.
17. Zabelina, N.A. (2000). The rate of salivation and some parameters of the oral fluid in children with allergic dermatoses. *Modern. stomatol.*, No. 1, pp.32–33.
18. Znobima, T.N. (2008). Medical and social aspects of morbidity and disability in children in modern Russia / *Ros. honey. lead*., T. 13, No. 1, pp. 42–46.
19. Isamulaeva, A.Z. (2010). Dental status and indicators of the cytokine spectrum in the secretion of the oral cavity in children with bronchial asthma / *Astrakhan. honey. zhurn*., T. 5, No. 4, pp. 33–37.
20. Karimov, D.M. (2019). *"Principles of early detection and prevention of sagittal dentoalveolar anomalies, diagnosis and approach to treatment"*. Abstract Doct. Medical Sciences (DFh). (p.25). Tashkent.
21. Kolesnik, K.A. (2009). Prevalence of dentoalveolar anomalies and deformities in children with endocrine diseases. *Tavricheskiy Med.-Biol. vestn.*, No. 4 (48), pp. 81–83.

22. Krylova, V.Yu. (2009). *Assessment of the state of the oral cavity in patients with bronchial asthma:* author. dis. ... Cand. honey. Sciences: (p.19). SPb..
23. Levenets, A.A., & Perova, E.G. (n.d.). On the relationship of scoliotic disease and dentoalveolar anomalies and deformations / Stomatology [Electronic resource]. URL: http: //www.mediasphera. ru. / Journals / stomo / dentali / 253/3821 /.
24. Markelova, T.N. (2011). Features of the cytokine profile, pharmacotherapy and quality of life indicators in preschool children with bronchial asthma: author. dis. Cand. honey. sciences: / RF. (p.25). Samara.
25. Murtazaev, S.S. (2019). *"Development of differentiated orthodontic treatment of mesial occlusion in children"*, Abstract of Doctor of Medical Sciences (DSc). (p.31). Tashkent.
26. Nurova, Sh.N. (2019). *"An integrated approach to the diagnosis, prevention and treatment of dentoalveolar anomalies in children with chronic tonsillitis and bronchitis"*. Abstract of the thesis. can. honey. Sciences (PhD). (p.40). Tashkent.
27. Perova, E.G. (2010). The nature of dentoalveolar anomalies and deformities in children with different conditions of the musculoskeletal system / *Institute Stomatol*., T. 1, No. 46, pp.74–75.
28. Persin, L.S. (2003). *Pediatric dentistry*. (p.640). Moscow: Medicine.
29. Repuzhinsky, I.M. (2002). *The influence of removable and non-removable orthodontic appliances on oral hygiene and the state of periodontal tissues in children*: author. dis. ... Cand. honey. Sciences: / Ukr. (p.20). Odessa.
30. Trezubov, V.N. (2010). Clinical assessment of oral hygiene methods for patients using orthodontic appliances of various designs / *Periodontol*., No. 1 (54), pp.70–71.
31. Chernysheva, O.E. (2014). Modern ideas about the pathogenesis of bronchial asthma in children / *Child health.*, No. 5 (56), pp. 84–90.
32. Almonaitiene, R. (2010). Factors influencing permanent teeth eruption. Part one – general factors / *Stomatologija*. Bd. 12, № 3, pp. 67–72.
33. Baricevic, M. (2011). Oral mucosal lesions during orthodontic treatment / *Intern. J. Paed. Dent*., Vol. 21, iss. 2, pp. 96–102.
34. Ebadian, B. (2008). Evaluation of tissue reaction to some denture-base materials: an animal study / *J. Contemp. Dent. Pract.*, Vol. 9, № 4, pp. 67–74.
35. Feres, M.F.N., & Hermann, J.S. (2012). Cephalometric evalution of adenoid / *Am. J. Orthodont*., Vol. 142, iss. 5, pp. 673–675.
36. Gafforov, S.A., & Nurova, Sh.N. (2019). «Maxillofacial anomalies in children with chronic tonsillitis and immunity factors, hypoxia and endogenous intoxication for the development and formation of pathology» *International Journal of «Pharmaceutical Research»* Vol11, Issue 3, July-Sept, 2019.
37. Gafforov, S.A., Olimov, S.Sh., Saidov, A.A., & Akhmadaliev, N.N. (2019). «Assessmentof Hepatobiliary System with Dentoalveolar Anomalies in School children» *«International Journal of Research»*, Volume 06 lssue 03 March 2019, pp. 576-583.
38. Gafforov, S.A., & Yrieva, O.O. (2019). «Importance of medical and social Factors in etiology of carious and non-carious diseases of children». *International Journal of «Pharmaceutical Research»*, Vol 11, Issue 3, July-Sept, 2019.
39. Gafforov, S.A., & Durdiev, Zh.I. (2020). «Violation of the formation of bone organs of the dentition system in children with respiratory system pathologies». *An. International Multidisciplinarni Reseorch Jurnal*. Kurukshetra India. 04.04.2020, pp. 325-333.
40. Kalha, As. (2009). Oral health promotion programmes during orthodontic treatment beneficial // *Evid. Based Dent.*, Vol. 10, № 4, pp. 111–112.
41. Khalilzadeh, S. (2007). Dental caries-associated microorganisms in asthmatic children / *Tanaffos.*, Vol. 44, № 4, pp. 42–46.
42. Mazzoleni, S. (2008). Dental caries in children with asthma undergoing treatment with shortacting beta2-agonist / *Eur. J. Paediatr. Dent.*, Vol. 9, № 3, pp.132–138.
43. Paganini, M. (2011). *Dental caries status and salivary properties of asthmatic children and adolescents* / Int. J. Paediatr. Dent., Vol. 21, 3, pp.185–191.
44. Patel, A., et al. (2009). O*rthod J. Medical disorders and orthodontics* / 2009. Vol. 36, suppl. 1, pp.1–21.
45. Rego, R.O. (2010). Clinical and microbiological studies of children and adolescent receiving orthodontic treatment / *Am. J. Dent*. Vol. 23, pp. 317–323.
46. Silvestrini, B.A. (2010). Manual orthodontic vs. oscillating-rotating electric toothbrush in orthodontic patients: a randomised clinical trial /*Eur. J. Paediatr. Dent.* 2010. Vol. 11, № 4, pp. 200–202.
47. Stensson, M. (2010). Caries Prevalence, Caries-Related Factors and Plaque pH in Adolescents with Long-Term Asthma / *Caries Res*., Vol. 44, № 6, pp. 540– 546.
48. Thomas, M.S. (2010). Asthma and oral health: a review / *Austral. Dent. J.*, Vol. 55, iss. 2, pp. 128–133.

49. Wilson, C.B. (2009). Epigenetic control of T-helper-cell differentiation / *Nat. Rev. Immunol.*, Vol. 9, pp. 91–105.

50. Zicari, A.M. (2009). Oral breathing and dental malocclusions / *Eur. J. Paediatr. Dent.* 2009. Vol.10, № (2), pp. 59–64.