

ISSN 1477-9315



JOURNAL OF  
**ENVIRONMENTAL  
HEALTH RESEARCH**

The abbreviation of the journal title "**Journal of environmental health research**" is "**J. Environ. Health Res.**". It is the recommended abbreviation to be used for abstracting, indexing and referencing purposes and meets all criteria of the [ISO 4 standard](#) for abbreviating names of scientific journals.

Journal of Environmental Health Research is devoted to the rapid publication of research in environmental health, acting as a link between the diverse research communities and practitioners in environmental health. Published articles encompass original research papers, technical notes and review articles. JEHR publishes articles on all aspects of the interaction between the environment and human health. This interaction can broadly be divided into three areas: 1. The natural environment and health— health implications and monitoring of air, water and soil pollutants and pollution and health improvements and air, water and soil quality standards; 2. The built environment and health – occupational health and safety, exposure limits, monitoring and control of pollutants in the workplace, and standards of health; and 3. Communicable diseases – disease spread, control and prevention, food hygiene and control, and health aspects of rodents and insects.

#### **Editorial board**

Professor Chan Lu – Xiang Ya School of Public Health, Central South University, China  
Dr. Kristina Mena - School of Public Health, the University of Texas Health Science Center at Houston, USA  
Dr Pablo Orellano - National Scientific and Technical Research Council (CONICET) and National Technological University, Argentina

Abdumalik Djalilov Tashkent Pediatric Medical Institute  
Dilfuza Turdieva Tashkent Pediatric Medical Institute  
Nigora Alieva Tashkent Pediatric Medical Institute  
Khursandoy Akramova Tashkent Pediatric Medical Institute  
Ozimbay Otaxanovich Jabbarov Tashkent medical academy  
Professor Susan Pinney – College of Medicine, University of Cincinnati, USA  
Professor Grażyna Plaza – Institute for Ecology of Industrial Areas, Poland  
Professor Andrew Povey – School of Health Sciences, University of Manchester, UK  
Dr Jack Siemiatycki - University of Montreal, Canada  
Dr. Baltabaev Ubaidulla Abdublikovich Tashkent State Dental Institute  
Dr. Asrankulova Diloram Bakhtiyarovna - doctor of medical sciences, associate professor. Andijan State Medical institute  
Dr. KHudaynazarova Salomat Tashkent Pediatric Medical Institute, Hospital Pediatrics 2, Department of Folk Medicine. PhD  
Dr. Rakhimov Oybek Umarovich Tashkent Pediatric Medical Institute  
Dr. Jafarov Khasan Mirzakhidovich, Tashkent Pediatric Medical Institute  
Dr. Sodikova Dilrabo Andijan state medical institute  
Dr. Kutlikova Gusalhon Andijan state medical institute  
DSc, Musashaykhov Khusanboy Tadjibaevich Andijan State Medical Institute  
Raimkulova Narina Robertovna Tashkent Pediatric Medical Institute  
Nasirova Feruza Jumabaevna Andijan State Medical Institute  
Kudratova Dilnoza Sharifovna Tashkent State Dental Institute  
Rasulova Khurshidakhon Abduboriyevna Tashkent Pediatric Medical Institute  
Tursumetov Abdusattar Abdumalikovich, DSci, professor, Tashkent Pediatric Medical Institute  
Omonova Umida Tulkinovna Doctor of Medical Sciences, Associate Professor of the Department of Neurology, Children's Neurology and Medical Genetics, Tashkent Pediatric Medical Institute

Manuscripts typed on our article template can be submitted through our website here. Alternatively, authors can send papers as an email attachment to [editor@jehr-online.org](mailto:editor@jehr-online.org)

Journal of environmental health research.  
ISSN 1477-9315 <http://www.jehr-online.org/>  
36 Victoria Road London N59 7LB

## **ANALYSIS OF CLINICAL MANIFESTATIONS AND PATHOGENETIC THERAPY OF DEMINERALIZATION OF HARD TEETH TISSUE IN PREGNANT WOMEN WITH EARLY TOXICOSIS.**

*Saidova Nilufar Akhrorovna – Doctoral student of the Department of Hospital Therapeutic Dentistry of the Tashkent State Dental Institute*

[sai-nilufar@mail.ru](mailto:sai-nilufar@mail.ru)

The relevance of the review article lies in the growing need to assess and analyze clinical manifestations and pathogenetic therapy of tooth demineralization in pregnant women with toxicosis in the early stages. Studies show that changes in mineral metabolism and hormonal balance during pregnancy significantly affect dental health and can lead to accelerated demineralization, increasing the risk of caries and other dental diseases. Given that toxicosis affects overall health and can aggravate changes in the composition of saliva and oral microflora, it is important to develop targeted preventive strategies that can minimize negative consequences for the teeth of pregnant women.

*Keywords* : tooth demineralization, caries in pregnant women, toxicosis in pregnant women.

**The objective** of this review article is to synthesize and analyze the existing data on the clinical manifestations of dental demineralization in pregnant women caused by toxicosis and to evaluate the effectiveness of various pathogenetic approaches to the treatment and prevention of this condition. Based on the analysis of international experience, including data from Canada, Lithuania, Chile and Sri Lanka, the article seeks to identify optimal prevention methods that can be adapted and applied to reduce the risk of dental problems in this category of patients. Thus, the article provides a rationale for more targeted clinical research and the development of comprehensive approaches to oral health management in pregnant women.

**Materials and methods.** To analyze the clinical manifestations and pathogenetic therapy of tooth demineralization in pregnant women with early-stage toxicosis, as well as to develop preventive strategies, a review of scientific literature covering the period from 2000 to 2023 was conducted. During the preparation of the article, data obtained from the PubMed, Scopus and Web of Science databases were used. Articles containing the keywords "teeth demineralization", "pregnancy", "toxicosis", "prevention of dental diseases", "oral hygiene" were selected and analyzed.

Additionally, randomized clinical trials and cohort studies from countries including Canada, Lithuania, Chile, and Sri Lanka were reviewed to assess the impact of preventive programs on the oral health of pregnant women and their children. Particular attention was paid to studies that analyzed the impact of rational oral hygiene and the use of antimicrobial and fluoride agents on the degree of tooth demineralization in pregnant women.

All the data obtained were systematized and analyzed in order to determine the most effective methods of pathogenetic therapy and prevention of tooth demineralization. To compare the effectiveness of different approaches, statistical

methods of data processing were used, such as meta-analysis and systematic review, which allowed for an objective assessment and comparison of the results of different studies.

Thus, a comprehensive approach was provided to the study of the problem of tooth demineralization in pregnant women with toxicosis and the development, on this basis, of recommendations for the prevention of dental diseases in this category of patients.

**Literature review.** Oral health in pregnant women is becoming the subject of extensive scientific research, given the significant variations in the prevalence and course of oral diseases, which is critical due to their impact on the health of women in general [6, 15, 18]. During pregnancy, as experts point out, there is an increase in the incidence of caries and periodontitis. Insufficient knowledge of dentistry, which is associated with socioeconomic status, level of education and lack of motivation for prevention, contributes to the aggravation of the situation [2, 17, 28]. There are no standardized approaches to the treatment of these diseases during pregnancy, and the importance of preventive programs aimed at strengthening the health of the mother and conducting antenatal prevention in the future child is undeniable [1, 7, 18, 29, 5, 10, 29].

During this period of a woman's life, the risk of developing dental problems increases significantly [3, 9, 30]. Studies show that during a normal pregnancy, 91.4% of women suffer from caries, and in 38% of them, the condition of previously healthy teeth worsens [11]. During gestosis, the index of dental problems increases, reaching high values, which indicates severe damage to the oral cavity [20]. Other studies confirm the extremely high prevalence of caries among pregnant women with toxicosis and additional extragenital pathology [23, 27]. It is noted that with an increase in the pregnancy period, the degree of dental damage also increases, especially between 20 and 32 weeks [17, 27]. Insufficient hygiene, the presence of local irritants, and a difficult pregnancy increase the prevalence of periodontal inflammation, with estimates ranging from 45% to 100% among the women surveyed [12, 18, 23, 34].

In the first trimester of pregnancy, with its normal course, 45-63% of women are diagnosed with gestational gingivitis, while catarrhal gingivitis is observed in 90% [6, 35]. The main microorganisms that cause inflammatory periodontal diseases are *Bacteroides gingivalis*, *P. melaninogenica*, *P. intermedia*, *Fusobacterium nucleatum*, *Peptostreptococcus micros*, *actinomyces viscosus*, and others [14]. The oral hygiene condition correlates with the course of pregnancy; thus, the GI index under physiological conditions is  $0.54 \pm 0.08$ , indicating mild gingival inflammation, and in mild preeclampsia -  $0.57 \pm 0.16$ . In the case of moderate preeclampsia, the GI index value doubles, reaching  $1.4 \pm 0.19$ , indicating moderate inflammation [14]. Another study recorded GI levels of  $1.14 \pm 0.09$  at the initial stage, increasing to  $2.17 \pm 0.05$  after 20 weeks, which corresponds to a severe degree of gingivitis [27]. According to two independent studies, poor oral hygiene and high API index values (45% and 43%) confirm the presence of unsatisfactory hygiene [5].

An international literature review indicates a link between periodontal disease and the development of preeclampsia [22, 35]. During pregnancy, there is a shift in

salivary pH to the acidic side, which leads to increased caries and deterioration of oral hygiene. The development of pyogenic granulomas in the second and third trimesters, associated with an increase in the growth factor in macrophages, and generalized tooth mobility in the third trimester confirm the influence of inflammatory and mineral changes in the periodontium [8, 27]. Pregnancy can also promote the development of combined fungal infections in the oral cavity, especially with a decrease in the level of potassium and calcium ions [33, 34]. Studies emphasize the role of hormonal changes, especially estrogen and progesterone levels, in increasing salivary viscosity and colonization of certain microorganisms, increasing the risk of dental diseases [7, 19, 24]. The role of C-reactive protein in the development of periodontal diseases during pregnancy has also been confirmed in scientific papers [23].

Chronic maternal diseases can seriously threaten the health of primary teeth in children, causing delays in the formation of dental tissues and slowing down the calcification of enamel and dentin, which prevents the achievement of the necessary mineralization usually observed during favorable antenatal odontogenesis [7, 19]. Studies confirm the influence of various microorganisms and viruses on the structure of the tooth germ, including blood filling, edema, and the thickness of enamel and dentin [3, 18].

Iron deficiency anemia in pregnant women increases caries problems and leads to changes in the color of tooth enamel, glossalgia, stomatalgia, paresthesia, dryness of the oral mucosa and atrophy of the papillae of the tongue. It is known that pregnant women aged 31-40 years with arterial hypertension suffer from more serious periodontal lesions compared to younger women [14]. Insufficient maternal nutrition affects the decrease in caries resistance of dental tissues and can cause dentoalveolar anomalies in children. Also, vitamin deficiency before and during pregnancy increases the risk of perinatal pathology and aggravates the course of diseases [6, 17].

During pregnancy, calcium is redistributed in the body, which leads to a change in phosphorus-calcium homeostasis and reduces the resistance of hard dental tissues, which is associated with insufficient adaptation mechanisms to such a significant factor as pregnancy. However, this does not affect the level of calcium in the enamel of the teeth of the developing fetus, in contrast to outdated data. Modern studies show an increase in calcium content in oral fluid during pregnancy [5, 16].

Insufficient intake of vitamins and minerals during the antenatal period may cause dental abnormalities, including enamel hypoplasia [35]. Pregnancy is also associated with changes in local oral immunity, including an increase in secretory immunoglobulin A (SIgA) concentrations in saliva, which is a reversible process [31].

Chronic infectious processes in the oral cavity, such as periodontitis, apical periodontitis and the presence of microbial plaque, can become a source of hematogenous spread of microorganisms. These conditions not only facilitate the penetration of infections, but also cause long-term pathological irritation in the body [24, 30]. Constant irritation of the nerve nodes, chronic intoxication and allergization can provoke various complications throughout pregnancy against the background of oral infections [23, 29].

International epidemiological and immunobiological studies indicate a link between periodontitis and the risk of premature birth and low birth weight. It is assumed that oral infections may increase the risk of caries in newborns, although some studies do not confirm this link [2, 10, ] . An analysis of the literature from 2003 to 2012 showed no effect from primary prevention of periodontal diseases during pregnancy. However, a study in Japan found that regular dental examinations can reduce the prevalence of periodontal diseases among pregnant women [7, 18, 22].

Demographic and social factors such as age, education level, occupation, bad habits including poor oral hygiene and low fluoride content in drinking water may influence the pattern of dental diseases during pregnancy [30]. Despite general awareness of oral hygiene rules, only 65% of pregnant women practice them. Knowledge of additional means such as dental floss and dental gels remains insufficient; only 50% of respondents know about dental floss and no one uses it [3, 17].

Only 6.3% of pregnant women assess their dental health as excellent, while the majority consider it satisfactory or poor. From the beginning of pregnancy, 71.5% of women undergo oral cavity sanitation [20, 21].

Abroad , more and more attention is being paid to teaching pregnant women the rules of adequate oral hygiene and correcting their hygiene skills. Pregnant women actively participate in educational seminars organized by midwives aimed at improving their oral health [16, 25]. A randomized clinical trial examining pregnant women's awareness of the risk of caries in their children showed statistically significant differences between the control and experimental groups: in the experimental group, the prevalence of caries in children was only 1.7%, versus 9.6% in the control group [6, 22].

Awareness of expectant mothers about childhood caries prevention remains critically low - only 26.2% of pregnant women are aware of the connection between the state of the mother's oral cavity and the health of the child's oral cavity [13, 26, 28]. Studies show that only 36% of pregnant women surveyed correctly interpret redness and swelling of the gums as signs of inflammation, and 53% do not know how much toothpaste to use to brush the teeth of children aged 1.5 to 5 years [1].

Overall, the level of knowledge of pregnant women about the prevention of major dental diseases remains unsatisfactory, highlighting the need for dental education and motivation to maintain oral health [7, 23].

Since the mid-20th century, programs for the prevention of dental diseases for pregnant women, which often include care for newborns, have been actively developed and implemented in international dental practice. These programs began to develop especially actively in the 1980s. An example is a comprehensive preventive program in Hanover, Germany, which involved 86 pregnant women. The program included four stages and covered children up to three, six, and fourteen years of age. Preventive measures were carried out every six months until the children reached three years of age and included hygiene training, nutritional correction, and professional oral hygiene. According to the results of medical examination and training, 89.7% of adolescents in the experimental group did not have caries [12, 16].

A study conducted in Vancouver, Canada in 2005–2006 analyzed a twenty-year preventive program for pregnant women. It involved 67 women with an average age of 27.7 years. As part of the program, pregnant women regularly underwent clinical examinations and questionnaires, used antimicrobial rinses and fluoride applications. The results showed a significant improvement in the condition of the periodontium in the participants [6, 19].

A similar program was conducted in Lithuania (Kaunas) involving 180 women aged 22-35 years, divided into test and control groups. In the test group, in addition to standard examination and consultations, professional hygiene procedures and fluoride applications were carried out, as well as the use of 0.12% chlorhexidine solution. This led to a 56.25% reduction in caries and an improvement in the hygienic and clinical indicators of the periodontium compared to the control group [6, 19].

In Chile ( Vina del Mar ) in 2007, a preventive program covered pregnant women from the fourth month and their children up to ten years of age. The program included educational activities, clinical examinations and treatment, including the use of fluoride toothpastes and antimicrobial rinses. The effectiveness of the program was confirmed by the fact that 70% of children whose mothers participated in the program did not have caries on their first permanent molars by the age of ten, while in the control group this figure was only 33%. In addition, the study showed that 97% of children aged 1 to 3 years had healthy teeth [5, 33].

**Conclusion.** Based on the analysis of scientific literature conducted within the framework of the review, it can be concluded that toxicosis in the early stages of pregnancy has a significant impact on the dental health of women. Demineralization of teeth in pregnant women is a common phenomenon, aggravated by changes in mineral metabolism and hormonal levels. The analyzed data confirm that the systematic implementation of preventive measures, including training in proper oral hygiene, the use of antimicrobial and fluoride-containing agents, significantly reduces the risk of developing dental problems not only in pregnant women, but also in their children.

The review shows that rational oral hygiene and regular dental examinations play a critical role in the prevention of tooth demineralization. The effectiveness of such programs is confirmed by a decrease in the incidence of dental caries and an improvement in periodontal health in studies conducted in Canada and Lithuania, as well as in Chile and Sri Lanka. Therefore, the scientific community and health authorities should emphasize the need to develop and implement comprehensive preventive programs for pregnant women, especially those suffering from toxicosis.

In conclusion, the article highlights the importance of integrating dental prevention into routine maternal health care. Advancing knowledge about the relationship between oral health and overall maternal and child health, as well as the application of individualized preventive strategies, may be key to reducing the risk of dental demineralization and improving the quality of life of pregnant women and their children.

## References

1. Avakyan V.M et al. The State of Dental Health in Pregnant Women // International Student Scientific Bulletin, 2015. No. 2-1. P. 10.
2. Agababyan L.R, Nasirova Z.A Post-abortion care - peculiarities of contraception // Fundamental and Applied Research in Science of the 21st Century: A Step into the Future, 2017. Pp . 48-50.
3. Ahmedova N.Sh. , Boltaev K.Zh. , Egamova S.K, Ismatova M.N Comprehensive Study of the Exchange of Some Trace Elements in Women of Fertile Age with Anemia // Pediatric Bulletin of the Southern Urals, 2015. No. 2.Pp. 14-16.
4. Ahmedov F.K. Peculiarities of the Circulatory System and Cardiodynamics in Pregnant Women with Severe Preeclampsia // Bulletin of the Tashkent Medical Academy, 2015. No. 2.Pp. 13-15.
5. Ahmedov F.K. Features of the Functional State of Kidneys and Some Homeostasis Indicators in Women with Physiological Pregnancy // Infection, Immunity, and Pharmacology, 2015. No. 1.Pp. 15-19.
6. Ahmedov F.K. Characteristics of Renal Blood Flow in Pregnant Women with Preeclampsia // Dermatology and Reproductive Health News, 2015. No. 2.Pp. 27-29.
7. Ahmedov F.K., Avakov V.E., Negmatullaeva M.N., Zaripova D.Ya. Correlational Features of Cardiodynamics and Renal Blood Flow in Pregnant Women with Severe Preeclampsia // New Day in Medicine, 2015. No. 1(9). Pp . 44-47.
8. Ayupova F.M., Kurbanova Z.Sh., Ikhtiyarova G.A Pathomorphological Changes in the Mother - Placenta - Fetus System in Antenatal Fetal Death // News of Dermatovenerology and Reproductive Health, 2019. Nos . 3-4. Pp . 8-13.
9. Bazhanova O.E., Kamilov Kh.P. , Zoirov T.E. Optimization of Comprehensive Treatment of Generalized Periodontitis // Proceedings of the IV International Conference on Clinical Pharmacology and Pharmacotherapy: Current Issues, 2014. Pp . 29-30.
10. Bakhmudov B.R., Bakhmudov M.B., Alieva Z.B. Study on the Awareness of Pregnant Women about Dental Health and Methods of Oral Hygiene // Clinical Dentistry, 2009. No. 1.Pp. 78-81.
11. Gadaev A.G., Rizaev Zh.A. , Norbutaev A.B., Olimjonov K.Zh. Iron, Its Role in the Functioning of Body Systems and Associated Oral Mucosal Injury // Problems of Biology and Medicine, 2020. No. 1.Vol . 116.Pp. 219-224. DOI: <http://doi.org/10.38096/2181-5674.2020.1.00058> .
12. Daminova Sh.B., Khamidov I.S., Kazakova N.N. Cytological Evaluation of Periodontal Tissue Condition in Children with Chronic Catarrhal Gingivitis // Eurasian Pediatric Bulletin. Saint Petersburg , 2019. No. 2.Pp. 96-100.
13. Dusmukhamedov D.M., Rizaev Zh.A ., Yuldashov AA, Hakimova Z.K, Akbarov A.A, Dusmukhamedova A.F. Clinical Characteristics of Secondary and Residual Defects and Deformations of the Palate after Uranoplasty // Problems of Biology and Medicine, 2020. No. 1.Vol . 116.Pp. 32-35. DOI: <http://doi.org/10.38096/2181-5674.2020.1.00009> .



14. Zoirov T.E., Elnazarov A.T. Improvement of Endodontic Treatment of Chronic Apical Periodontitis by Delayed Filling Method // Achievements in Science and Education, 2019. No. 9-2 (50).

15. Ikhtiyarova G.A., Tuksanova D.I., Ayubov B.M. Clinical Prognostication of Postpartum Complications in Women Who Have Endured Severe Preeclampsia and Eclampsia // Postgraduate Doctor, 2005. No. 2.Pp. 102-108.

16. Kamilov Kh.P., Zoirov T.E., Kamilov E.Kh. Efficacy of the Vektor Device in the Comprehensive Therapy of Endodonto -Periodontal Lesions // Achievements in Science and Education, 2018. No. 5 (27).

17. Kurbanov B.B, Kurbanova M.T. Morphofunctional Changes of the Placenta in Pregnant Women with Mild Preeclampsia // Problems of Biology and Medicine, 2020. No. 1.Vol. 116.Pp. 62-63. DOI: <http://doi.org/10.38096/2181-5674.2020.1.00017>.

18. Mavlyanov I.R et al. Analysis of Modern Concepts on the Formation of Critical Periods in the Development of Iron Deficiency Anemias, Pharmacological and Clinical-Economic Aspects of the Use of Iron Preparations (Review) // Bulletin of the Council of Young Scientists and Specialists of the Chelyabinsk Region, 2018 Vol. 1.No. 3 (22).

19. Navruzova N.O, Ikhtiyarova G.A, Karimova G.K, Navruzova U.O, Shukurov I.B, Amanova Kh.I. Modern Diagnostic Methods for Early Detection of Cervical Diseases // Doctor Information, 2019. No. 4.Pp. 77-82.