

PREVALENCE AND RISK FACTORS OF DENTAL DISEASES IN PREGNANT WOMEN LIVING IN DIFFERENT REGIONS OF UZBEKISTAN

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Abstract.

The aim was to study the prevalence and risk factors of dental disease development in pregnant women living in different Uzbekistan regions. The prevalence and intensity of dental caries among pregnant women are 1.3 times higher in the Urgench district of the Khorezm region compared to the Kibray district of the Tashkent region. These figures increase with each subsequent pregnancy. The same pattern is observed for periodontal and oral mucosa diseases. The most significant medical and biological factors contributing to the development of dental diseases in pregnant women were age, several pregnancies, intergenerational period, course and terms of pregnancy, the presence of extragenital diseases. Among medical and social risk factors, the most significant were education, living conditions, oral hygiene, sanitary culture, and medical activity of pregnant women.

Keywords: dental diseases, pregnancy, prevalence, risk factors, tooth decay, periodontitis.

Introduction.

It is known that due to changes in metabolic processes in women during pregnancy, conditions may be created for the development of dental caries, gingivitis, paradontopathies, diseases of the oral mucous membrane (hereinafter - OMS) of premature tooth loss [6,15].

Among pregnant women, it was found that the percentage of dental caries increases with the number of pregnancies. It was found that the average number of carious teeth among the firstborn teeth is, on average, 7.06% of all available teeth, among repeat pregnancies - 11.57%, and among multiple births - 13.6%. The incidence of dental caries was higher in women who often gave birth at intervals of 1-1.5 years between births [1,9].

It has been found that even a normal pregnancy is often accompanied by inflammatory events in SOPR, more often than gums [5,19]. The first signs of "gingivitis of pregnant women" were found to appear at 3-4 months of pregnancy and be of catarrhal or hypertrophic inflammation type [2,4,15].

Periodontal disease was 43.5% among women with the pathology of pregnancy and 15.74% among women with a normal pregnancy course. The frequency of periodontal disease in both pathology and normal course of pregnancy depends not on the number of pregnancies but also on the pregnancy itself [8,20]. The increase in the frequency of periodontal disease in persons with the pathology of pregnancy indicates the relationship between the course of pregnancy and the clinic of periodontal disease.

The presence of stones in pathological tooth and gum pockets contributes to the reproduction of microorganisms in them [2,17], being a constant source of chronic foci, which in its turn supports the pathological course of pregnancy and contributes to the development of postpartum complications, infection of the fetus and the newborn with toxicoseptic process phenomena in children [13,18].

The need for a deeper analysis of the existing system of organization of dental care for pregnant women dictates the need for further development of this problem.

Research objective. To study and assess the prevalence and risk factors of dental disease development in pregnant women living in different Uzbekistan regions.

Research material and methods. The study's object was pregnant women permanently residing in different Uzbekistan - Urgench district of the Khorezm region and Kibray district of the Tashkent region. Urgench district refers to an environmentally unfavorable region, and Kibray region refers to a more prosperous region.

A total of 1992 pregnant women were examined (1012 in Urgenchsky Region and 980 in Kibraysky Region). The contingent of pregnant women was divided into the following age groups: under 20 years old; 20-29 years old; 30 years old and older.

Studies were conducted in the above regions among women registered with a general practitioner and gynecologist for pregnancy, aged 16 to 40 years at various gestational ages. Pregnant women were examined by the method of the Central Research Institute of Dentistry of Russia [3] using the recommendations of the World Health Organization (hereinafter - WHO) [11].

The standard dental checkups program included the study of all basic indicators of the prevalence of dental diseases. The WHO card was used to assess the dental status of pregnant women.

400 individual cards of pregnant women in need of dentistry were studied in dynamics (from registration till delivery) to estimate circulation, volume, and character of pregnant dentists' attendance and reveal organizational factors influencing their dentist status.

Determining factors and predicting the risk of dental diseases development in pregnant women was carried out using the Bayesian Probabilistic Method - normalized intensive indicators (hereinafter - NIP) [9].

Modern methods of variation statistics processed the study's materials by calculating intensive, extensive indicators, average values, determining the degree of reliability of the results and their differences (Student and Fisher criteria). At the organization and carrying out of researches observed principles of evidence-based medicine.

Results and discussion. Comparative analysis of data in the studied regions showed that in the Urgench district, the number of people seeking dental care was 1.2 times lower than in Kibray Region on average ($P < 0.05$). Correspondingly, the number of examined persons in the order of planned sanitation in Urgench district was 1.8-2.0 times lower than in the comparable region.

The number of examined pregnant women in Kibray district 1.3 times less patients needed sanitation than among pregnant women living in Urgench district (respectively $44.4 \pm 1.6\%$; $n=435$ and $56.6 \pm 1.6\%$; $n=573$ - $P < 0.05$). It should be noted that only $42.5 \pm 1.2\%$ ($n=185$) were sanitized in the Kibray district among those in need of oral health care, while in the comparable district is much less $33.2 \pm 1.1\%$ ($n=190$).

The prevalence of dental caries among pregnant women living in Urgench district was 1.2 times higher than among pregnant women of Kibray district ($P < 0.05$). The same pattern is observed among pregnant women of different ages, depending on their region.

Simultaneously, a general pattern of dental caries prevalence among pregnant women in both regions was revealed - dental caries increases with age.

Among pregnant women under 20 years of age, dental caries was registered in Urgench district in $90.3 \pm 1.4\%$ in the Kibray region in $73.7 \pm 1.3\%$ of cases.

In the next age group of pregnant women (20-29 years), dental caries increased by 4.1% and 3.2%, respectively.

Among pregnant women over 30 years of age, dental caries' prevalence is higher than in previous ages in both Urgench and Kibray regions and amounted to 98.2±1.0% and 81.4±1.5%, respectively (P<0.05).

In general, the prevalence of dental caries among pregnant women tends to increase with age and pregnancies. In Urgench district, the prevalence of dental caries among women having multiple births was 11.7% higher than among women having first births, while in women living in Kibray district, the difference was 1.5 times lower and made 7.6%.

It was proved that this indicator's level depended not only on age and number of pregnancies but also on other factors, in this case, and the region of residence.

Out of all surveyed contingent of pregnant women, 95.0±1.2% (n=961) in Urgench district and 80.0±1.4% (n=784) of pregnant women in Kibray district (P<0.05) required therapeutic dental care, while 87.3±1.5% (n=883) and 65.0±1.3% (n=637) of pregnant women (P<0.05) required therapeutic dental care, respectively.

The state of periodontal disease during pregnancy is characterized by high lability. During the examination of pregnant periodontal disease were found in 76.7±1.6% (n=776) of cases among pregnant women living in Urgench district and 67.3±1.5% (n=660) of cases among the surveyed living in Kibray district (Table 1).

Table 1
Prevalence of periodontal disease in pregnant women living in different regions of Uzbekistan (%)

Pregnant women's population	Age, y.o.		
	Up 20	20-29	30 and above
Healthy	35,9±3,4	21,0±1,6*	12,9±2,4*
	47,9±3,0	28,8±1,7*	21,0±2,8*
With periodontal disease	64,1±3,4	79,0±1,6*	87,1±2,4*
	52,1±3,0	71,2±1,7*	79,0±2,8*
	72,0±2,0	87,3±1,5*	93,2±1,9*
	59,1±3,8	65,8±2,1*	77,7±3,2*
With signs of bleeding	56,2±2,5	67,3±2,1*	88,5±2,5*
	47,3±3,9	52,9±2,3	66,2±3,6*
Toothstone	23,5±2,8	30,5±2,0*	41,0±3,8*
	13,4±2,7	21,8±1,8*	29,5±3,5*
Parade pockets	9,4±2,6	15,9±1,6*	24,4±3,3*
	5,3±3,1	9,7±1,3	10,6±2,3*

*Note: in the denominator indicators of Urgench district, in the numerator of Kibray district; * - indicator of reliable differences from the data of 20-year-old pregnant women.*

Among young pregnant women (under 20 years of age), periodontal disease was 1.2 times more frequent among women living in the northern region, where environmental degradation persists in comparison with the same contingent living in an environmentally more favorable area –Kibray region (P<0.05).

At subsequent ages, the difference between these indicators among pregnant women in the regions studied is insignificant. Analysis of the data revealed another pattern that, with age, the number of pregnant women with healthy dental status decreases with a parallel increase in people with periodontal pathologies. This pattern is typical for both regions under study.

A more detailed analysis found that all of the above main symptoms of gingivitis and periodontitis were more common in women with multiple births than in women with high birth rates ($P < 0.05$).

A similar pattern can be traced in the study of periodontal disease intensity (number of healthy and affected sextants per 1 pregnant woman) in the contingent we studied.

As we know, SOPR is sensitive and is the first to be exposed to external stimuli. In this regard, we studied the state of SOPR in pregnant women living in environmentally unfavorable and favorable regions in a comparative aspect.

As the results of our studies have shown, both first and second time, pregnant women living in Urgenchdistrict have a higher incidence of SOPR pathology than this contingent living in the Kibray district (Table 2).

Viral stomatitis, candidiasis stomatitis, eczematous heilitis, desquamative glossitis, chronic relapsing aphthous stomatitis (hereinafter referred to as CHRAS), and catarrhal heilitis are the most frequent diseases in both groups.

Among pregnant women living in the Kibray region, the structure of SOPR morbidity was significantly different. Some pregnant women (22.4%) in Urgenchdistrict had diseases of SOPR such as viral and candidiasis stomatitis, which were absent in the surveyed pregnant women of the Kibray region.

Table 2
Frequency of oral mucosa lesions in pregnant women, depending on the place of residence (M±m, per 100 pregnant women)

Disease	Group of pregnant women			
	Premature		Повторнобеременные	
	Urgenchdistrict	Kibray region	Urgenchdistrict	Kibray region
Stomatitis, in total	35,1±2,3	11,5±1,9*	73±3,9	20,8±2,3*
Catalan	2,1±0,8	0,7±0,01*	5±1,1	2,4±0,8
CHRAS	5,3±1,1	3,9±0,5*	8,1±1,2	4,6±1,7*
Virus	7,6±1,3	0	12,4±2,1	3±0,8*
Candidate	5,6±0,9	0	11,2±2	0
Desquamative glossitis	4,9±0,7	2,1±0,3*	8,9±1,6	3±0,9*
CatarralHeilith	3,4± 1,1	2,6±0,7*	7,3±1,8	4,1±0,8*
Exematousheilite	6,2±0,7	2,2±0,5*	10,7±2,3	3,7±0,6*

Note: * - an indicator of reliable differences between districts.

To identify the most significant factors contributing to the development of dental and periodontal disease in pregnant women, we conducted a retrospective analysis of the frequency of studied medical-biological, environmental, medical-social, organizational factors in our surveyed contingent.

Out of the surveyed, only 54.7% of pregnant women went to the dentist for prophylactic purposes in the first weeks of pregnancy, most of them (80.0%) needed this or that type of dental intervention. Among untimely applicants for dentistry (at the term more than 4 weeks of pregnancy), dentistry interventions' need was 1.2 times higher.

Pregnancy, due to physiological processes, affects the condition of teeth and SOPR, especially gums. The carried out analysis of the state of organization of dental care for pregnant women has allowed revealing that the planned oral sanitation of pregnant women at early stages is not carried out completely, there is no constant dynamic monitoring of the dental status of pregnant women, the risk factors contributing to the development of dental diseases are not taken into account at the dispensary.

The examination results showed that regardless of the place of residence, the impact of exogenous and endogenous factors on pregnancy did not differ significantly. Therefore, we will present generalized indicators in the future, and if we identify differences, we will try to distinguish them.

Our analysis allowed us to conclude that the lower is the level of education of women, the higher is the prevalence of dental caries and periodontal disease. The prevalence of dental caries among pregnant women with higher education was 1.5 times lower than among women with secondary and incomplete secondary education ($P < 0.05$).

Periodontal disease is also inversely correlated with education ($\rho = -1$). The same pattern can be traced in the analysis of social category impact on the prevalence of dental diseases, so the frequency of caries and periodontal disease is 1.3-3.6 times higher among workers and rural workers, 1.3-2.7 times higher among housewives than among employees ($P < 0.001$).

The survey of pregnant women with extragenital diseases showed that the highest risk of dental diseases is among pregnant women suffering from anemia of various degrees (tooth decay - 97.6%; periodontal disease - 92.1%), gastrointestinal diseases (tooth decay - 96.5%, periodontal disease - 77.1%), diabetes mellitus (caries - 85.7%; periodontal disease - 85.7%).

The frequency of tooth decay and periodontal disease in pregnant women with other body systems diseases was relatively the same. However, among the latter, the risk of dental diseases was higher 1.2-3.0 times than among pregnant women without extragenital diseases ($P < 0.05$).

It should be noted that pregnant women living in Urgench district neglect examination by dentists 1.3 times more often than pregnant women living in the Kibraydistrict.

Many pregnant women did not receive recommendations from a dentist on proper oral care (35.0%), and a significant part of them (60.0%) received this information from other sources - medical and popular scientific literature, mass media, and the Internet.

To solve the question of the joint impact of the above factors taken together and the degree of impact of each of them, we used the methods of mathematical statistics - the method of normalized indicators -NIP) [13].

In our case, the number "1" defining the concept of "cohort" was chosen as the normalized value, i.e., the integral evaluation was carried out only among the homogeneous population. The NIP was defined as the ratio of the gradation index of the factor obtained in the research (P) to the normalizing value. The relative risk indicator (hereinafter -R) (R) was

defined as the ratio of maximum and minimum grading of each factor. Based on the prognostic table, it was found that of all factors contributing to the development of dental diseases in pregnant women, the most significant is residence. So among pregnant women living in ecologically unfavorable areas, the risk of development of dental pathology is 3 times higher than among pregnant women living in more favorable areas ($P < 0,001$).

The intergenerational period between births (OR-2,73), pregnancy course (OR-2,6), social category of the pregnant woman (OR-2,8), carrying out of oral cavity sanitation before pregnancy (OR-2,57), observance of pregnant oral cavity hygiene (OR-2,48) has great importance in the development of dental diseases.

Besides, from the prognostic table, a possible range of risk was determined by a set of factors. For this purpose, the minimum values of the prognostic coefficient for each factor were summarized and divided by the sum of relative risk indicators. The found value is the initial value of the risk of dental disease development (28,3).

The maximum values of prognostic indices for each factor were determined (67,1). The risk range is in the range of 28,3-67,1. It follows that the greater is the value of the normative integrative index of risk of development of dental diseases as a result of the complex of investigated factors (P), the higher is the probability of their development in a given pregnant woman and the more grounds for singling her out into an unfavorable prognosis group.

To distinguish pregnant women with different risk probabilities, the range is divided into 3 intervals: the smallest, medium, and the largest. Accordingly, the following forecast groups are also singled out for the ranges: favorable forecast group, attention group, and unfavorable forecast group (Table 3).

Thus, a noticeable difference in dental disease prevalence among pregnant women living in different environmental regions was revealed. Pregnant women living in Urgenchdistrict had a significantly higher prevalence of dental diseases than the same contingent living in KibrayRegion ($P < 0.01$). The most significant medical and biological factors contributing to the development of dental diseases in pregnant women were age, the number of pregnancies, intergenerational period, course and terms of pregnancy, presence of extragenital diseases.

Table 3
Risk ranges for dental diseases in pregnant women and their evaluation

Risk probability ranges	Size	Risk groups
Smallest	28,3-41,2	Favorable forecast
Average	41,2-54,1	Attention
Largest	54,1-67,1	Unfavorable forecast
Full range	28,3-67,1	

According to the study results among pregnant women, the most common diseases were caries and periodontal disease. The mass of these diseases, their unfavorable impact on the pregnant woman's general condition, and the fetus's development suggest the need for new, more effective preventive measures.

Conclusions:

1. The prevalence and intensity of dental caries among pregnant women are 1.3 times higher in the Urgench district of the Khorezm region than the Kibray district of Tashkent region ($P<0.05$) both compared regions, these figures increase with age, with each subsequent pregnancy. The same pattern is observed for periodontal disease ($P<0.01$).
2. Primary and secondary pregnant women living in Urgench district have a higher frequency of SOPD pathology than pregnant women living in Kibray district ($P<0,001$). Viral stomatitis, candidiasis stomatitis, and eczematous heilitis are the most frequently observed. Among pregnant women living in the Kibraydistrict, the structure of SOPR morbidity is significantly different. Some of the surveyed pregnant women (22.4%) in Urgenchdistrict had viral and candidiasis stomatitis, which was absent in pregnant women of Kibraydistrict.
3. The most significant medical and biological factors contributing to the development of stomatological diseases in pregnant women were age, number of pregnancies, intergenerational period, course and terms of pregnancy, presence of extragenital diseases. Among medical and social factors of risk of developing a stomatological pathology in pregnant women, the most significant are education, living conditions, observance of hygiene of cavity of the mouth, level of sanitary culture and medical activity of pregnant women.
4. In Urgench district, the highest relative risk of development of stomatological diseases is observed in pregnant women with the pathological course of pregnancy (OR-7,0), having a short intergenerational period (OR-6,3), who have not carried out oral cavity sanitation before pregnancy (OR-5,2). Among pregnant women living in Kibraydistrict, the most significant risk factors of dental diseases development are the intergenerational period between pregnancies (OR-5,4), social category of women (OR-2,5), absence of oral cavity sanitation before the given pregnancy (OR-1,85), pathological course of pregnancy (OR-1,4), failure to observe oral hygiene (OR-1,4).

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