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Oral Health Status of Pregnant Women

Ingrida Vasiliauskiene

SUMMARY

The aim of the study was to determine the prevalence and severity of periodontal disease among pregnant women and also to evaluate the status of oral hygiene.

The prevalence and severity of caries was evaluated, having estimated DMFS and DMFT. The prevalence of periodontal diseases and the degree of severity was evaluated by CPITN index, gums by Silness-Loė (GI) index, oral hygiene by OHI-S (according to Green-Vermillion) index.

1070 pregnant 15-45 years old women, visitors of Kaunas women and family clinics were examined. The prevalence of caries was 99.9%; DMFS 19.47± 0.316 (10.33), DMFT 12.065± 0.106 (3.485).

The prevalence of periodontal diseases was 93.09%. The composition of CPITN: 6.91% healthy periodontium (code 0), 15.14% – bleeding on probing (code 1), 58.60% – supragingival and subgingival calculus (code 2), 18.97% – periodontal pockets 4–5 mm depth (code 3), 0.37% – gum pockets 6 mm and more depth (code 4).

The oral hygiene of the examined women was satisfactory; the mean of OHI-S was 1.51±0.017 (0.542).

The mean of Silness-Loė gum index was 1.48± 0.021 (0.69).

Key words: pregnant women, DMFT, DMFS, the prevalence of dental caries, oral hygiene.

INTRODUCTION

Many studies were carried out in etiology and pathogenesis of the main dental diseases – dental caries and periodontal diseases. The relation between oral hygiene, prevalence and severity of dental caries and periodontal diseases is proved [1,2,3].

According to the studies held in Lithuania, it has been found that oral hygiene among children and adults is still insufficient. In many studies a close relationship between a mother's oral health status and the oral health of her children has been found [4]. The prevention of dental caries and periodontal diseases started early will guarantee children with healthy teeth. Prevention should be started when women are pregnant. During their pregnancy women are highly motivated and have great interest in all information and recommendations concerning child's health [5,6].

Description of the epidemiological situation is the corner stone of a successful preparation and implementation of the preventive program. It is very important to know the oral cavity status of pregnant women in order to recommend effective preventive measures. Dental plaque is the most important risk factor in the development of dental caries and periodontal diseases. In the period of pregnancy the amount of hormones changes. These changes predispose gum swelling and sensitivity. In the period of pregnancy the permeability of capillaries is higher and bleeding appears sooner [9,10]. Thus, teeth brushing becomes complicated, and the development of dental caries and periodontal diseases is easier.

Preventive programs are necessary in order to save mother's teeth healthy and provide women with information about child's teeth care.

Ingrida Vasiliauskiene, *D.D.S., Assist. at the Clinic of Preventive and Pediatric Dentistry, Kaunas Medical University, Lithuania.*

Address correspondence to Dr.I.Vasiliauskiene: Luksos-Daumanto 6, Kaunas, Lithuania.

THE AIM OF WORK

To examine the status of the oral cavity in order to determine the prevalence, DMFT and DMFS of dental caries, the status of the periodontal tissues and the oral hygiene of pregnant women.

MATERIAL AND METHODS

1070 healthy pregnant women, who attended women consultations and family clinics in Kaunas, were examined. Dental examination and questionnaires were used in this examination. Clinical examination was performed on a dental chair, using dental instruments: the mirror, the probe and the periodontal probe to determine the CPITN index.

The age of women varied from 15 to 45 years. They were divided into 3 groups (table 1):

Table 1. *The distribution of pregnant women by age.*

Group	Women age	Number of examined women
I	22 years and <	338
II	23–27 years	390
III	28 years and >	342

Dental caries was scored on the surface of all teeth in accordance with the WHO criteria. 0 –Sound; 1 – Decayed; 2 – Filled, with decay; 3 – Filled, no decay; 4 – Missing, as a result of caries; 5 – Missing, any other reason; 6 – sealant, varnish; 7 – bridge abutment or special crown; 8 – Unerupted tooth; 9 – Excluded tooth. The data was registered in the questionnaire of the epidemiological examination according to WHO recommendations.

The dental caries was determined by DMF index (Decayed; Filled; Extracted). The index was recommended by Klein and co-authors in 1938. DMFT (teeth) and DMFS (surfaces) indexes were used.

The composition of DMFT and DMFS was studied, in order to clarify which part of the index (filled, decayed or extracted) is higher.

CPITN (WHO) index (table 2) was used in order to evaluate the periodontal status.

The status of periodontium was evaluated by points; and the treatment needed – by degrees.

Treatment needed:
0° - no treatment needed (Code 0)
I° - oral hygiene instructions and using of preventive measures (Code 1)
II° - oral hygiene instructions, calculus removing (Code 2)
III° - oral hygiene instructions, calculus removing and complex treatment (Code 3,4)

Gingival index Silness-Loė (GI) (table 3). Mesial, vestibular, distal and lingual gingiva around the 16; 21; 24; 36; 41 and 44 teeth was examined.

GI – the sum of the points given for every separate tooth was divided by 4. The evaluation of GI:
0.1–1.0 – light gingivitis
1.1–2.0 – medium gingivitis
2.1–3.0 – heavy gingivitis

Oral hygiene was evaluated by OHI-S index.

The OHI-S index consists of 2 components: the debris (plaque) index (DI) and the calculus index (CI). OHI-S = DI + CI

Vestibular surfaces of the 16; 11; 26; 31 and lingual surfaces of 36 and 46 teeth were examined. Only fully erupted teeth were examined. If the first molar was not present, the second molar was examined, in case of the central incisor was absent, the contra-lateral central incisor was examined.

Plaque was disclosed with a special disclosing agent.

The criteria of plaque evaluation:
0 – no plaque;
1 – soft plaque, which covers 1/3 of the tooth surface;
2 – soft plaque, which covers more than 1/3, but less than 2/3 of the tooth surface;
3 – soft plaque, which covers more than 2/3 of the tooth surface.

Table 2. *The description of the CPITN index.*

Code	The Description of Condition
Code 0	Healthy periodontal tissues
Code 1	Bleeding on gentle probing (25 g force)
Code 2	Supragingival and/or subgingival calculus iatrogenic-marginal irritation
Code 3	Shallow pockets up to 4 - 5 mm
Code 4	Deeper pockets from 6 mm

The criteria of calculus evaluation:
0 – no calculus
1 – supragingival calculus, which covers 1/3 of the tooth surface;
2 – supragingival calculus, which covers 1/3 – 2/3 of the tooth surface;
3 – supragingival calculus, which covers more than 2/3 of the tooth surface.

The sum was divided by 6 (the number of the teeth examined).

The evaluation of index is provided in table 4.

The participants were asked how often they brushed their teeth. The answers were registered in a questionnaire. The answers were divided into 5 groups:
1 – twice a day;
2 – once a day;
3 – from 1 to 3 times a week;
4 – less than once a week;
5 – never.

The data was transferred to the computer, corrected for logical errors. The statistical analysis was performed using the Statistical Program for Social Sciences (SPSS 8.0 for Windows), where *t* stands for 'test' and Chi for 'square analysis'. The significance was accepted at the $p< 0.005$.

Table 3. *The description of the gingival index Silness-Loė (GI).*

Score	Criteria
0	Normal gingiva, no inflammation, no discoloration, no bleeding
1	Mild inflammation, slight color change, mild alteration of gingival surface, no bleeding
2	Moderate inflammation erythema, swelling, bleeding on probing or when pressure applied
3	Severe inflammation, severe erythema and swelling, tendency to spontaneous hemorrhage, some ulceration

Table 4. *The description of the OHI-S index.*

Oral hygiene	Points
Perfect	0
Good	0.1–1.0
Satisfactory	1.1–2.0
Bad	2.1–6.0

Table 5. *The DMFS of the pregnant women examined in Kaunas.*

Age groups	DMFS $\overline{X}$ ±SE	SD	DMFS					
			DS		MS		FS	
			$\overline{X}$ ±SE	%	$\overline{X}$ ±SE	%	$\overline{X}$ ±SE	%
I. 22 y and <	17,38± 0,44	8,07	9,559±0,643	55	7,509±0,214	43,20	0,311±0,089	1,789
II. 23- 27 y	17,20±0,40	7,94	7,982± 0,471	46,41	8,872± 0,21	51,58	0,346± 0,086	2,012
III. 28 y and >	24,157± 0,70	12,90	10,52	43,55	10,871± 0,307	45	2,763± 0,252	1,437
In total	19,47± 0,316	10,334	9,29± 0,286	48	9,076± 0,148	46,62	1,105± 0,097	5,68

.l.= 2, p< 0.001

RESULTS AND DISCUSSION

Results of the study showed that the prevalence of caries was very high in all age groups and was equal to 99.9%. Only one woman of all the examined had all teeth healthy. Caries prevalence in the first age group was equal to 99.7%; in the second group – 100%, and in third group – 100%. Bachmudov and Korzunov in their study got similar results, where the prevalence of dental caries among young age groups of pregnant women was equal to 97.5% (I group) and 92.37% (II group) and 100% among older pregnant women (III group).

The mean DMFT of the pregnant women was 12.065±0.106 and DMFS – 19.47±0.316 (table 5). DMFT in different age groups varied between 11.115±0.71 and 13.485±0.188. The mean DMFS varied between 17.38±0.44 and 24.157±0.698 (table 5). Comparing DMFT between age groups, it has been found that DMFT increased with the age of participants, whereas DMFS in the first and second groups was almost the same. Similar data was found in the study held by Bachmudov and Korzunov.

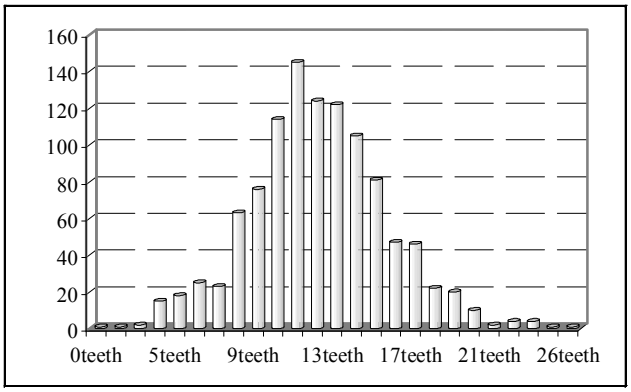

Figure 1. *The DMFT among the examined pregnant women.*

It is rather important to know the composition of the DMF index. The analysis of the DMF index shows the number of the decayed, filled and extracted surfaces to one woman, which allows us to make conclusions about the level of dental care. One woman had 8.98±0.286 (9.37) of the decayed, 9.08±0.148 (4.86) of the filled, and 1.10±0.097 (3.18) of the extracted surfaces.

The analysis of DMFT shows that one woman had 4.93 of the carious, and 6.97 of the filled teeth. The analysis of DMFT in different age groups is shown in table 6.

Analyzing the data of DMFT and DMFS, we found that pregnant women showed a different number of the decayed teeth, which varied between 1 and 26 and between 1 and 101 of the decayed surfaces. Most of the women (n=76) had 19, and 65 women had 17 decayed surfaces. One of the participants had even 101 decayed surfaces. 124 women had 12, and 1 women – 26 decayed teeth (Fig.N1).

CPITN index was used to determine the degree of destruction of the periodontal tissue and evaluate the treatment needed (table 7). According to the results of the study, we found that 6.97% of the participants

Table 6. *The DMFT index of the pregnant women examined in Kaunas.*

Age groups	DMFT $\overline{X}$ ±SE	SD	DMFT					
			K		P		I	
			$\overline{X}$	%	$\overline{X}$	%	$\overline{X}$	%
I. 22 y and <	11,115± 071	3,135	5,20	46,48	5,82	52,3	0,06	0,54
II. 23- 27 y	11,667± 0,172	3,395	4,56	39,08	6,88	58,97	0,07	0,60
III. 28 y and >	13,485± 0,188	3,471	4,94	36,63	8,16	60,51	0,55	4,08
In total	12,065± 0,106	3,485	4,93	40,86	6,97	57,77	0,22	1,82

1.l.=2, p<0.001

Table 7. *The prevalence of periodontal diseases among pregnant women (according to the CPITN index).*

Age groups	CPITN									
	Healthy periodontium Code 0		Gum bleeding Code 1		Dental calculus Code 2		Pathologic gum pockets 4-5 mm Code 3		Pathologic gum pockets > 6 mm Code 4	
	n	%	n	%	n	%	n	%	n	%
I. 22 y and <	32	9,47	92	27,22	181	53,55	33	9,76	_	_
II. 23-27 y	28	7,18	52	13,33	261	66,92	48	12,31	1	0,26
III. 28 y and >	14	4,09	18	5,27	185	54,09	122	35,67	3	0,88
In total	74	6,91	162	15,14	627	58,60	203	18,97	4	0,37

p< 0.001

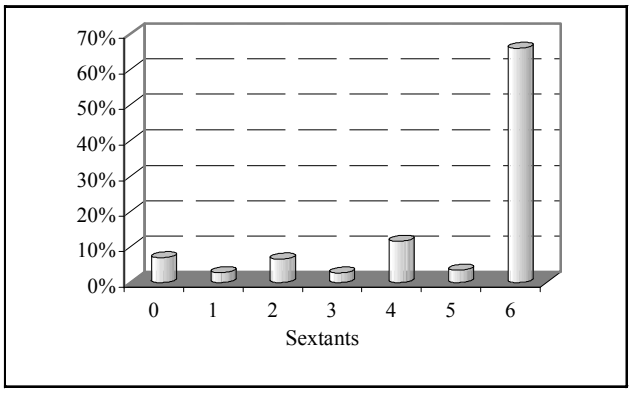

Figure 2. *The distribution of the CPITN index among pregnant women (affected sextants).*

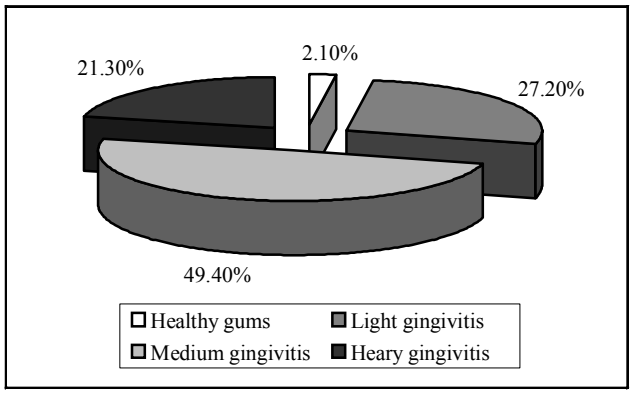

Figure 3. *The composition of Silness-Loė (GI) index for gums.*

had healthy periodontium (Code 0), 15.14% – bleeding on probing (Code 1), 58.60% – supragingival and subgingival calculus (Code 2); 18.97% pockets 4–5 mm (Code 3); 0.37% pockets 6mm and more (Code 4).

According to the findings of the present study, it can be concluded that 6.97% of the examined women needed periodontal treatment. 15.14% women who had bleeding on probing, needed oral hygiene instructions and preventive measures. 58.60% of the examined women who had supragingival and subgingival calculus needed oral hygiene instructions, scaling, professional oral hygiene, the change of fillings, crowns and bridges. 18.97% of the women who had pockets 4–5 mm needed oral hygiene instructions, professional oral hygiene: scaling and root planning, supragingival and subgingival calculus, conservative treatment, plaque removing, smoothening of the root surfaces, scaling the walls of the pockets (curretage). 0.37% of the women who had periodontal pathologic pockets 6mm and deeper needed all the above-mentioned treatment, and a systemic treatment as well.

The periodontal treatment needed increases with age. The mean of affected sextants was 4.828±0.058; the mean of bleeding on probing sextants was 1.69±0.049, calculus – 2.43±0.060, gum pockets 4–5 mm – 0.69±0.048; gum pockets 6 mm – 0.013±0.006 (Table 8). In different age groups: in the first age group the mean of the affected was 4,28±0.115 (Fig. N2).

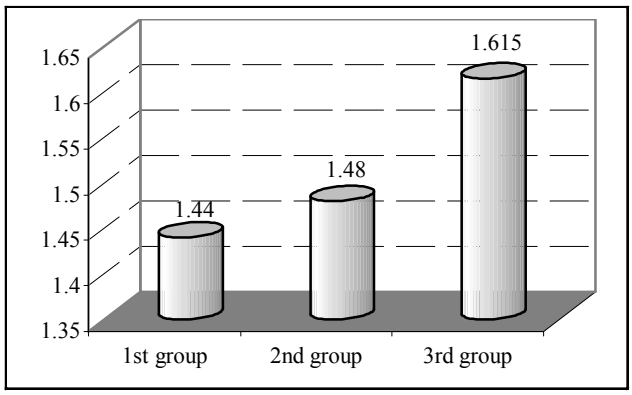

Figure 4. *The mean OHI-S index in different age groups of pregnant women.*

The gum status according to Silness-Loė (GI) index has been evaluated. The mean was 148±0.021. Only 2.1% (n=22) of the examined women had absolutely healthy gums. 20.7% (n=222) had light gingivitis; 42.7% (n=457) had medium gingivitis; 21.3% (n=371) had heavy gingivitis (Fig. N3). The mean of GI among the first age group participants was 1.25±0.037, among the second age group – 1.47±0.033, and among the third age group participants – 1.73±0.033. It can be concluded that the gum index increases with women age.

The oral hygiene was evaluated by the oral hygiene index (OHI-S). The mean of OHI-S was 1.51±1.017, which shows a satisfactory oral hygiene (Fig.N4)

The mean of OHI-S index in different age groups was:

the first group – 1,44±0,029

the second group – 1,48±0,026

the third group – 1,615±0,030.

The results of the examination showed that only 0.6% (n=6) of the participants had perfect oral hygiene, 20.84% (n=223) - good oral hygiene, 67.48% – satisfactory and even 11.12% - bad oral hygiene.

In the first age group only

Table 8. *The analysis of CPITN according to the number of affected sextants.*

Age groups	The mean number of affected sextants per person				
	Healthy sextants Code 0 $\overline{X}$ ±SE	Gum bleeding Code 2 $\overline{X}$ ±SE	Deantal calculus Code 2 $\overline{X}$ ±SE	Periodontal pocket 4-5 mm Code 3 $\overline{X}$ ±SE	Periodontal pocket 6 mm Code 4 $\overline{X}$ ±SE
I. 22 y and <	1,71± 0,101	2,09± 0,09	1,86± 0,102	0,34± 0,06	-
II. 23-27 y	1,099± 0,089	1,79± 0,070	2,65± 0,099	0,41± 0,06	0,051± 0,005
III. 28 y and >	0,35± 0,102	1,20± 0,076	2,75± 0,104	1,35± 0,110	0,35± 0,019
In total	1,177± 0,058	1,69± 0,049	2,43± 0,060	0,69± 0,048	0,013± 0,06

p< 0,001

one (0.3%) woman showed perfect oral hygiene, 87 (25.7%) women – good oral hygiene, 220 (65.1%) women – satisfactory; 30(8.9%) – bad. In the second group - 3 (0.8%) women showed perfect oral hygiene, 78 (20.0%) – good, 278 (72.3%) – satisfactory; 30 (7.7%) – bad. In the third group - 2 (0.6%) women showed perfect oral hygiene, 58 (16.9%) – good, 224 (65.2%) – satisfactory, and 59 (17.3%) – bad (Table 9). The state of oral hygiene was the best in the youngest age group. According to the answers about the brushing frequency, it has been found that 292 of the pregnant women (27.4%) brushed their teeth twice a day, 627 (58.8%) – once a day, and 137 of the pregnant women (12.8%) – from 1 to 3 times a week, less than once a week – 10 women (0.9%). One (0.1%) woman never brushed her teeth. The data concerning different age groups is given in table 10.

Table 9. *The status of oral hygiene of the examined women (according to the OHI-S index).*

Age groups	The number of examined persons	The status of oral hygiene							
		Perfect 0		Good 0.1–1		Satisfactory 1.1–2		Bad 2.1–and >	
		n	%	n	%	n	%	n	%
I.22 y and <	338	1	0.3	87	25.7	220	65.1	30	8.9
II. 23–27 y	390	3	0.8	78	20.0	278	72.3	30	7.7
III. 28 y and >	342	2	0.6	58	16.9	224	65.2	59	17.3
In total	1070	6	0.56	223	20.84	722	67.48	119	11.12

p< 0.001

Table 10. *The frequency of teeth brushing among the pregnant women examined in Kaunas.*

The frequency of teeth brushing	Age groups						In total	
	22 y and <		23–27 y		28 y and >			
	n	%	n	%	n	%	n	%
2 times a day	117	34	107	27,7	66	19,3	292	27,2
1 time a day	181	53,7	231	59,8	212	62,9	627	58,5
1- 3 times a week	37	11	46	11,9	54	15,8	137	12,8
Less than once a week	2	0,6	2	0,5	6	1,8	9	0,9
Newer brush	_	_	_	_	1	0,3	1	0,1

It can be concluded that younger women mainly brush their teeth twice a day. Furthermore, it has been found that they have heard about oral diseases, tooth care from dentists and from school. It shows the effectiveness of preventive programs at school.

CONCLUSIONS

1. The results of the present study showed that the prevalence of dental caries was 99.9%, the highest prevalence was 100% in the age group of 28 years and older.

2. The mean DMFT was 12.065±0.106, it varied between 11.115±0.71 and 13.485±0.188. The mean DMFS was 19.47±0.316 and varied between 17.38±0.44 and 24.157±0.70.

3. The participants had 11–12 (n=269; 25%) decayed teeth and 17–19 (n=198; 19,5%) surfaces.

4. The prevalence of periodontal diseases was 93.03%, increased with age and varied from 90.53% to 95.91%. The calculus and gum bleeding on probing made up a higher percentage of this pathology.

5. Having evaluated the CPITN index, we defined that procedures of professional oral hygiene are needed the most.

6. All preventive methods and measures are necessary in order to improve oral hygiene among pregnant women.

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