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Correlations of Lactobacillus in Saliva and OHI, PI, GI and PBI Indices in Pregnant Women

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ABSTRACT

Pregnancy is a completely new physiological condition that stimulates important protective forces of the future mother. The changes that occur in the body of the pregnant woman are hormonal, biochemical, anatomical, and histological which are manifested in the functions of all organs. This study included 66 pregnant women in their first pregnancy living in Pristina or coming from nearby places in Kosovo. It aimed at dermining the Oral Hygiene Index (OHI), Plaque Index (PI), Gingival index (GI) and Index of interdental gingival bleeding (PBI) in pregnant women in the first and third trimester of pregnancy. The amount of Lactobacillus in saliva was determined by the diagnostic test of CRT-bacteria. The results show that OHI value in the third trimester of pregnancy for (p = 0.000) was significantly higher than the value in the first trimester; IDP value in the third trimester of pregnancy for (p=0.000) was significantly higher than the first trimester value; GI value in the third trimester of pregnancy was significantly higher than in the first trimester p<0.01(p=0.006); PBI value in the third trimester of pregnancy was significantly higher than in the first trimester (p=0.000). A weak positive correlation was obtained between the OHI index and Lactobacillus in pregnant women in the first and third trimesters (p> 0.05). The correlation between IDP and the value Lactobacillus in pregnant women in the first and third trimesters showed a weak positive value (p> 0.05). The correlation between GI and the value of Lactobacillus in pregnant women in the first and third trimester showed a weak negative insignificant correlation for Spearman Rank Order R = –0.05 and p> 0.05. The results obtained from this study pointed at small differences in the examined parameters which are very important for early detection and timely prevention.

Key words: *saliva, pregnancy, Lactobacillus, OHI, PI, GI, PBI index.*

Introduction

Periodontal diseases are among the most common oral infectious diseases associated with the establishment of a highly pathogenic biofilm that triggers an immune/inflammatory host response, leading to the destruction of supporting periodontal tissues and eventual tooth loss.[1,2]

Oral bacteria and periodontal infections have been indicated as potential risk factors for several systemic diseases[3–6]. Due to the anatomical proximity of the periodontal biofilm to the gingival bloodstream, periodontal pockets may act as reservoirs of microbial pathogens and their products, as well as inflammatory mediators and immune complexes that may disseminate to other sites of the human body.[5,7] The periodontal microbiota plays a major role in the establishment of periodontal health and the development of periodontal diseases. This microbiota comprises mostly commensal resident members of oral species that have co-evolved to colonize the human oral cavity.[8–10]

The changes that occur in the body of the pregnant woman are hormonal, biochemical, anatomical, and histological which are manifested in the function of all its organs as well as in the oral cavity.[11] Among the most common are gingival hyperplasia, gingivitis, pyogenic granulomas, dental caries and erosions, and qualitative and quantitative changes in saliva.[12] The role of high circulating estrogen levels is well established and is associated with a higher prevalence of gingivitis and gingival hyperplasia.[13]

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During pregnancy the most common problem is gingivitis. It is estimated that 30 to 75% of pregnant women have gingivitis to a greater or lesser extent during pregnancy. The reasons for this are multiple. Many women reduced care to maintain oral hygiene during pregnancy, among reasons for this can be nausea, vomiting, weakness, feeling of chronic fatigue, insomnia, etc. These conditions in pregnant women divert attention from the usual hygiene habits for which pregnant women think are not primary or of vital importance. Such an approach followed by hormonal changes that accompany pregnancy can often lead to significant dramatic changes in the oral cavity.[4,15]

The saliva analysis has become an important resource for the determination of the role of saliva in physiological and pathological implications and is a useful tool for disease diagnostics mainly due to its origin, composition, function, and interaction with other organic systems.

Although harmful processes that accompany periodontal diseases (such as bone destruction and periodontal ligament destruction) are associated with bacterial plaque, in general, they occur as a result of the host's response to this microbial invasion.[16] Due to that fact, the aim of our research is based on the latest literature research and own clinical findings to provide data for assessment and impact of Lactobacillus in saliva on the oral hygiene level and the degree of gingival inflammation in pregnant women in the first and third trimester of pregnancy.

Materials and Methods

The study included 66 pregnant women in their first pregnancy, as dependent samples, which live in Prishtina (Kosovo) or come from the surrounding areas. All subjects are treated in the Department of Gynecology and Obstetrics, University Clinical Center, Prishtina, Kosovo. Pregnant women with high-risk pregnancies and pregnant women with soft tissue changes in the oral cavity were excluded from the study.

The research protocol was approved by the Ethical Committee of Medical Faculty, University of Prishtina "Hasan Prishtina, Ref. nr. 4096, 07. 06. 2019.

Clinical examinations

Clinical examinations consisted of the following clinical procedures: obtaining detailed anamnesis of the patient and determining the condition and gestational age (weeks/months of pregnancy), determining oral hygiene, and determining the basic periodontal condition. Detailed patient anamnesis was obtained according to the previously established protocols for guiding pregnancy.

Examined indices

Soft Plaque Index of the teeth (OHI- Oral Hygiene Index) was determined according to the Green-Vermillion[17] scoring system and it consisted of the following: Score 0 – no soft deposits (plaque); Score 1 – soft deposits (plaque) are localized only in the gingival third of the tooth crown; Score 2 – soft deposits (plaque) cover more than one third but less than two-thirds of the tooth crown surface; Score 3 – very poor oral hygiene (soft deposits covering more than two-thirds of the crown surface).

Plaque Index (PI) according to Löe- Silness[18] is expressed in numbers and the interpretation was: Score 0 – no deposits (plaque) at the crown surface of the tooth; Score 1 – a thin layer of plaque on the crown of the tooth near the gingiva, detected by probe; Score 2- moderate amount of plaque on the tooth crown macroscopically visible; Score 3- a large amount of plaque that filled the interdental space.

Gingival index (GI) according to Löe-Silness was interpreted as: Score 0- normal gingiva; Score 1- mild inflammation; Score 2- moderate inflammation; Score 3- severe inflammation.

Index of interdental gingival bleeding (Papilla Bleeding Index – PBI) is interpreted following the guidelines of Ainamo[19]: Score 0 – No evident hemorrhage after examination; Score 1 – Hemorrhage is evident only in one place after probe; Score 2 – There is linear or multiple bleeding points from the papilla; Score – 3 Interdental spaces filled with blood immediately after the probing; Score 4 – Excessive bleeding after probing.

Estimation of the Lactobacillus amount in saliva

Saliva was collected in special sterile tubes, early in the morning between eight and ten o'clock a.m., at least two hours after the meal and after teeth brushing without the use of rinse aid.

The amount of Lactobacilli in saliva was determined by a diagnostic test of CRT-bacteria (Vivadent, Schaan, Lichtenstein) where we strictly followed the manufacturer's instructions. Dentocult LB – includes a paraffin tablet to stimulate saliva, Bacitracin, which prevents the bacterial growth, which we added to the saliva at least 15 minutes before use, a strip containing selective Lactobacillus agar on all sides, a test strip showing lactobacillus colonies/ml in saliva, which was divided into four classes and test sterile tubes. We used an incubator located in the Department of Microbiology and Parasitology at the Clinical Hospital in Pristina.

Lactobacillus test data were interpreted as follows: Score 0: Very low consumption of cariogenic foods and $<10^3$ (CFU) / ml colony) with a higher lactobacilli number; Score 1: Low consumption of fermented carbohydrates and cariogenic diet 10^4 CFU / ml; Score 2: Moderate consumption of fermented carbohydrates and cariogenic foods 10^5 CFU / ml; Score 3: Consumption of highly fermented carbohydrates and inadequate foods> 10^6 CFU / ml.

Statistical analysis

The data analysis was performed with the statistical program Statistica 7.1 for Windows and SPSS Statistics 23.0. The following methods were applied: In the analysis

of the series with attributive characteristics of Lactobacillus, the percentages of the structure were determined (%); The differences in the series with attributive characteristics in the correlation between the first and third trimester were tested using the Fisher Exact test / Monte Carlo Sig. (2-sided), (p); Differences in the correlation between the first and third trimester tested with Wilcoxon Matched Pairs Test (Z / p); Significance is determined by $p < 0.05$. The data are presented in tabular and graphical form.

Results

Descriptive statistics

The results of the study related to the assessment of Lactobacillus in the saliva of pregnant women in the first trimester of pregnancy, out of a total of 66 pregnant women, in 33 (50.00%) registered low consumption of fermented carbohydrates and cariogenic foods (<10^4 CFU / ml / formed colonies with Lactobacillus number), 24 (36.40%) had moderate consumption of fermented carbohydrates and cariogenic foods (10^5 CFU / ml / formed colonies with Lactobacillus number) and in 9 (13.60%) of pregnant women consumption of highly fermented carbohydrates and inadequate nutrition (> 10^6 CFU / ml / formed colonies with Lactobacillus number) was reported (Table 1).

TABLE 1

OHI / IDP / GI / PBI / DESCRIPTIVE STATISTICS

Index	Valid N	Mean	Confidence –95,00%	Confidence +95, 00	Min.	Max.	Std. dev.
First trimester							
OHI	66	1.02	0.88	1.15	0	3	0.54
IDP	66	1.08	0.93	1.22	0	3	0.59
GI	66	0.33	0.18	0.49	0	3	0.64
PBI	66	0.61	0.37	0.84	0	3	0.94
Third trimester							
OHI	66	1.65	1.46	1.84	1	3	0.77
IDP	66	1.70	1.49	1.90	1	3	0.82
GI	66	0.64	0.46	0.81	0	2	0.72
PBI	66	1.18	0.95	1.42	0	2	0.96

The differences in the values of OHI, IDP, GI, and PBI in pregnant women in the correlation between the first and third trimester of pregnancy for OHI value in the third trimester of pregnancy for $Z = 4.46$ and $p < 0.001$ ($p = 0.000$) are significantly higher than the value in the first trimester; the value of IDP in the third trimester of pregnancy for $Z = 4.52$ and $p < 0.001$ ($p = 0.000$) is significantly higher than the value in the first trimester; the value of GI in the third trimester of pregnancy for $Z = 2.72$ and $p < 0.01$ ($p = 0.006$) is significantly higher than the value in the first trimester; the value of PBI in the third trimester of pregnancy for $Z = 3.46$ and $p < 0.001$ ($p = 0.000$) is significantly higher than the value in the first trimester (Table 2).

TABLE 2

OHI / IDP / GI / PBI (DIFFERENCE / FIRST TRIMESTER & THIRD TRIMESTER)

Pair of Variables	Valid	T	Z	p-level
OHI – first trimester & OHI – third trimester	66	56.00	4.46	0.000
IDP – first trimester & IDP – third trimester	66	27.50	4.52	0.000
GI – first trimester & GI –- third trimester	66	48.50	2.72	0.006
PBI – first trimester & PBI – third trimester	66	57.50	3.46	0.000

The results of the study related to the assessment of Lactobacillus in the saliva of pregnant women in the first trimester of pregnancy, out of a total of 66 pregnant women, in 33 (50.00%) low consumption of fermented carbohydrates and cariogenic foods (<10^4 CFU / ml / formed colonies with Lactobacillus number was registered), 24 (36.40%) had moderate consumption of fermented carbohydrates and cariogenic foods (10^5 CFU / ml / formed colonies with Lactobacillus number) and in 9 (13.60%) of pregnant women consumption of highly fermented carbohydrates and inadequate nutrition (> 10^6 CFU / ml / formed colonies with Lactobacillus number was reported). (Table 3).

TABLE 3

LACTOBACILLUS/ FIRST TRIMESTER

	Frequency	Percent	Valid Percent	Cumulative Percent
Low consumption of FC	33	50.0	50.0	50.0
Moderate consumption of FC	24	36.4	36.4	86.4
High consumption of FC	9	13.6	13.6	100.0
Total	66	100.0	100.0	

The results of the study related to the assessment of Lactobacillus in saliva in pregnant women in the third trimester of pregnancy out of a total of 66 pregnant women, in 40 (60.60%) low consumption of fermented carbohydrates and cariogenic foods was registered (<10^4 (CFU) / ml / formed colonies with number of Lactobacillus), 20 (30.30%)

had moderate consumption of fermented carbohydrates and cariogenic food (10^5 CFU / ml / formed colonies with number of Lactobacillus) and in 6 (9.10%) pregnant women consumption of highly fermented carbohydrates and inadequate nutrition (> 10^6 CFU / ml / formed colonies with number of Lactobacillus was reported). (Table 4).

TABLE 4

LACTOBACILLUS /THIRD TRIMESTER

	Frequency	Percent	Valid Percent	Cumulative Percent
Low consumption of FC	40	60.6	60.6	60.6
Moderate consumption of FC	20	30.3	30.3	90.9
High consumption of FC	6	9.1	9.1	100.0
Total	66	100.0	100.0	

The presented cross-tabulation of Lactobacillus values in the correlation between the first and third trimester of pregnancy is as follows, from 33 (100.00%) women who in the first trimester had <10^4 (CFU / ml / formed colonies with number of Lactobacillus), in the third trimester 19 (57.60%) were with <10^4 (CFU / ml / formed colonies with number of Lactobacillus), 11 (33.30%) pregnant women were with 10^5 CFU / ml / formed colonies with a number of Lactobacillus) and 3 (9, 10%) with> 10^6 CFU / ml / formed colonies with a number of Lactobacillus).

Of the 24 (100.00%) women who in the first trimester had moderate consumption of fermented carbohydrates and cariogenic foods (10^5 CFU / ml / formed colonies with Lactobacillus number), in the third trimester 15 (62.50%) pregnant women were with <10^4 (CFU / ml / formed colonies with number of Lactobacillus), in 6 (25.00%) pregnant women were with 10^5 CFU / ml / formed colonies with number of Lactobacillus) and 3 (12.50%) with> 10^6 CFU / ml / formed colonies with number of Lactobacillus).

From 9 (100.00%) women who in the first trimester had a consumption of highly fermented carbohydrates and inadequate nutrition (> 10^6 CFU / ml / formed colonies with number of Lactobacillus), in the third trimester in 6 (66.70%) <10^4 (CFU / ml / formed colonies with number of Lactobacillus were confirmed) and 3 (33.30%) pregnant women had values of 10^5 CFU / ml / formed colonies with number of Lactobacillus). In the presented cross-tabulation of the values of Lactobacillus in the correlation between the first and third trimester of pregnancy for Fisher's Exact Test = 1.331 and p> 0.05 (p = 0.914) / Monte Carlo Sig. (2-sided) / 0.907 – 0.921 / there is no significant difference. (Table 5).

Correlations

OHI index * Lactobacillus / First trimester

The correlation between OHI index and the value of Lactobacillus in pregnant women in the first trimester, a weak positive insignificant correlation was observed for Spearman Rank Order R = 0.12 and p> 0.05. As values rise (consumption of fermented carbohydrates and cariogenic foods) of Lactobacillus in the first trimester the values of the OHI index increased insignificantly. (Figure 1)

OHI index * Lactobacillus / Third trimester

The ratio between OHI index and Lactobacillus value in pregnant women in the third trimester, for Spearman Rank Order R, = 0.02 and p> 0.05, a very weak positive insignificant correlation was observed, with rising values (consumption of fermented carbohydrates and cariogenic food) of Lactobacillus in the third trimester insignificantly the values of the OHI index increased (Figure 2)

IDP * Lactobacillus / First trimester

The correlation between IDP and the value of Lactobacillus in pregnant women in the first trimester, a weak positive insignificant correlation was observed for Spearman Rank Order R = 0.05 and p> 0.05. With the elevation

TABLE 5

LACTOBACILLUS / FIRST TRIMESTER /THIRD TRIMESTER

			LB Third trimester			Total
			Low consumption of FC	Moderate consumption of FC	High consumption of FC	
LB First trimester	Low consumption of FC	Count	19	11	3	33
		%	57.6%	33.3%	9.1%	100.0%
	Moderate consumption of FC	Count	15	6	3	24
		%	62.5%	25.0%	12.5%	100.0%
	High consumption of FC	Count	6	3	0	9
		%	66.7%	33.3%	0.0%	100.0%
	Total	Count	40	20	6	66
		%	60.6%	30.3%	9.1%	100.0%

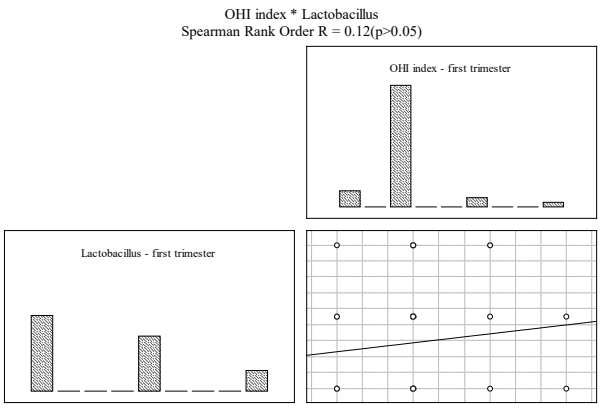

*Fig. 1. OHI index * Lactobacillus / First trimester.*

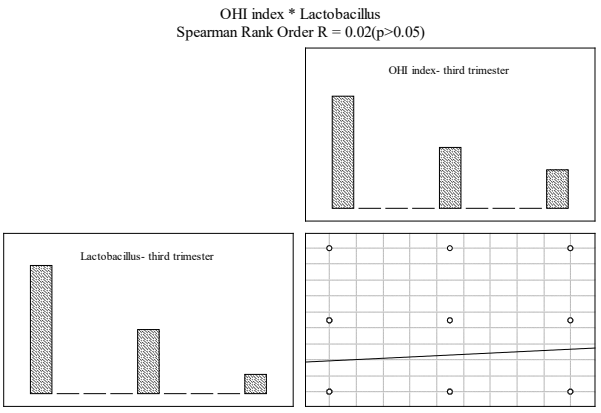

*Fig. 2. OHI index * Lactobacillus / Third trimester.*

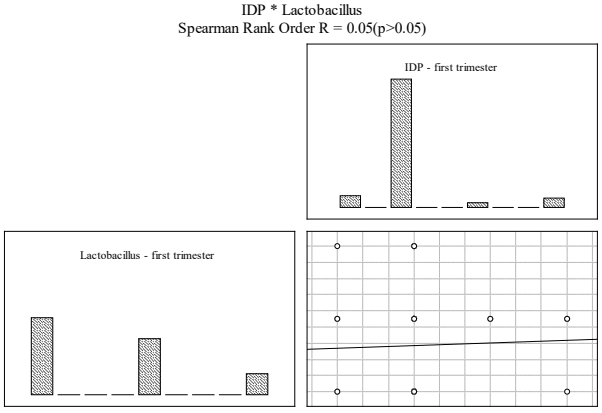

*Fig.3. IDP * Lactobacillus / First trimester.*

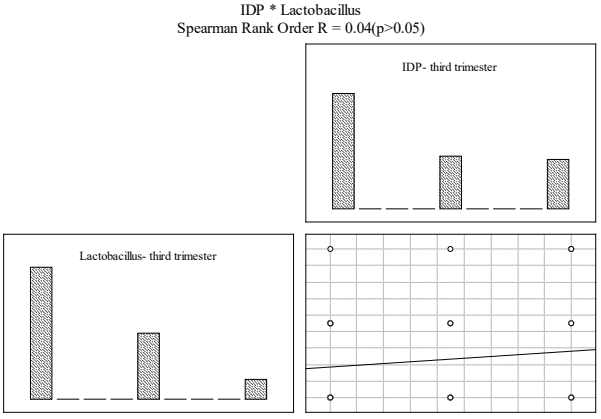

*Fig. 4. IDP * Lactobacillus / Third trimester.*

of the values (consumption of fermented carbohydrates and cariogenic foods) of Lactobacillus in the first trimester, IDP values increased insignificantly (Figure 3)

IDP * Lactobacillus / Third trimester

The ratio between IDP and the value of Lactobacillus in pregnant women in the third trimester, very weak positive insignificant correlation was observed for Spearman Rank Order R = 0.04 and p> 0.05, as with rising values (consumption of fermented carbohydrates and cariogenic foods) of Lactobacillus in the third trimester the values of IDP increased insignificantly (Figure 4).

GI * Lactobacillus / First trimester

The relation between GI and the value of Lactobacillus in pregnant women in the first trimester, a very weak negative insignificant correlation was observed for Spearman Rank Order R = –0.02 and p> 0.05, with rising of the values (consumption of fermented carbohydrates and cariogenic food) of Lactobacillus in the first trimester GI values decreased insignificantly (Figure 5).

GI * Lactobacillus / Third trimester

The ratio between GI and Lactobacillus value in pregnant women in the third trimester, a weak negative insignificant correlation was observed for Spearman Rank Order R = –0.05 and p> 0.05. By increasing the values (consumption of fermented carbohydrates and cariogenic foods) of Lactobacillus in the third trimester, the values of GI decreased insignificantly (Figure 6).

PBI * Lactobacillus / First trimester

The ratio between PBI and Lactobacillus value in pregnant women in the first trimester moderately weak positive insignificant correlation was observed for Spearman Rank Order R = 0.19 and p> 0.05, with the elevation of the values (consumption of fermented carbohydrates and cariogenic foods) of Lactobacillus in the first trimester PBI values insignificantly increased (Figure 7).

PBI * Lactobacillus / Third trimester

The ratio between PBI and the value of Lactobacillus in pregnant women in the third trimester, for Spearman Rank Order R = –0.32 and p <0.05 a moderately strong negative significant correlation was found, with increasing of the values (consumption of fermented carbohydrates and cariogenic food) of Lactobacillus in the third trimester there was a significant decrease of PBI values (Figure 8).

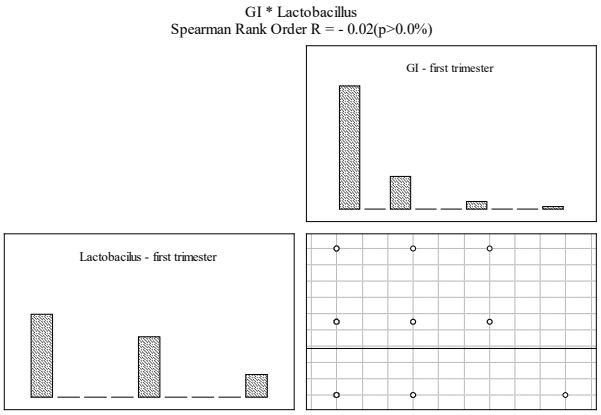

*Fig. 5. GI * Lactobacillus / First trimester.*

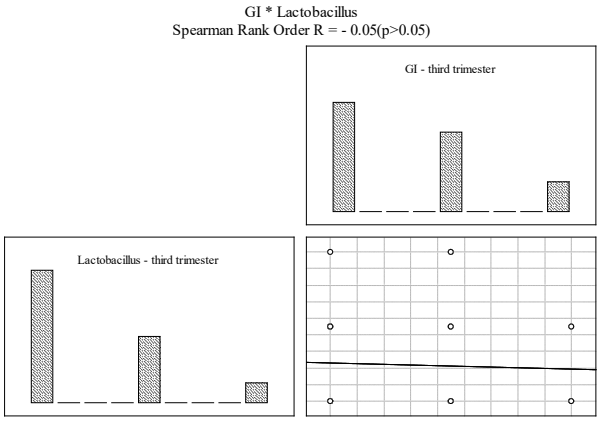

*Fig. 6. GI * Lactobacillus / Third trimester.*

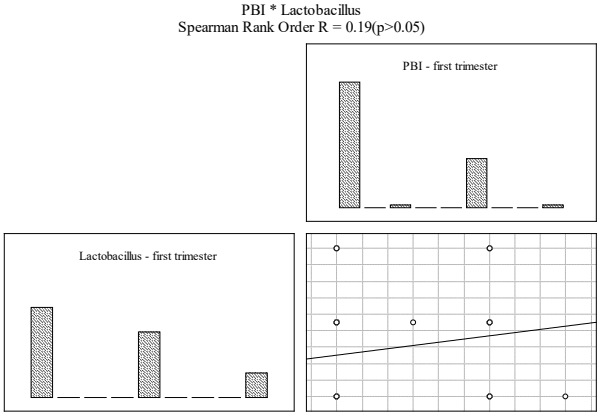

*Fig. 7. PBI * Lactobacillus / First trimester.*

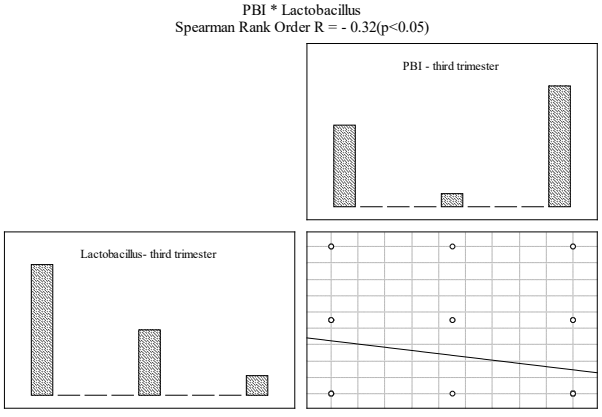

*Fig. 8. PBI * Lactobacillus / Third trimester.*

Discussion

In this study, we assessed the prevalence and counts of pathogens in the subgingival area in pregnant women in the first and third trimesters of pregnancy.

The values obtained for the examined parameters from our study indicated that the differences in the values of OHI, IDP, GI, and PBI in pregnant women in the correlation between the first and third trimester of pregnancy for the value of OHI in the third trimester of pregnancy for $p < 0.001$ ($p = 0.000$) is significantly higher than the value in the first trimester; the value of IDP in the third trimester of pregnancy by $p < 0.001$ ($p = 0.000$) is significantly higher than the value in the first trimester; the value of GI in the third trimester of pregnancy for $p < 0.01$ ($p = 0.006$) is significantly higher than the value in the first trimester; the value of PBI in the third trimester of pregnancy for $p < 0.001$ ($p = 0.000$) is significantly higher than the value in the first trimester.

The results of our study were of significantly higher values in the third trimester of pregnancy which correlated with the studies of Vittek et al.,[20] and Lapp et al.[21] that link this condition to the hormonal activity during pregnancy that may predispose pregnant women to gingivitis and periodontitis. They point out progesterone as the possible cause of local inflammation. Loe et al.[22] and Miyazaki et al.[23] in their study regarding the changes in these parameters between pregnant and non-pregnant women observed that the frequency of periodontitis increased from the first to the third trimester. As a possible reason, they indicated the predisposition of the periodontal tissues during pregnancy.

Decreased oral hygiene in our subjects in the third trimester is due to reduced care and ignorance of the oral health issues that lead to the accumulation of dental plaque during pregnancy. This finding was in accordance with the findings of Agbelusi et al.[24] and Pirie et al.[25], who associated gingival changes in early pregnancy with dietary changes, such as sugary drinks and sweets, mainly taken to prevent nausea but also contribute to lower salivary pH.

In studies by Ho et al.[26] for periodontal tissue changed in pregnant and non-pregnant women, gingival inflammation was found to be statistically significantly higher ($p < 0.001$) in pregnant women in the third trimester. The

authors linked the gingival inflammation in pregnant women increased deposition of dental plaque biofilm.

Cross-tabulation between the OHI index and the value of Lactobacillus in pregnant women in the first and third trimesters for p> 0.05 found a weak positive correlation. The correlation between IDP and the value of Lactobacillus in pregnant women in the first and third trimester for p> 0.05, showed a weak positive correlation. The correlation between GI and the value of Lactobacillus in pregnant women in the first and third trimester, for Spearman Rank Order R = –0.05 and p> 0.05, was a weak negative insignificant correlation. The correlation between PBI/ Lactobacillus we obtained was a significant correlation of the examined parameters between the first and third trimester for p <0.01 (p = 0.002).

According to Pirie, reduced maintenance of oral hygiene increases the number of anaerobic bacteria in saliva and periodontal tissues and can cause worsening of the inflammatory reaction. This is consistent with the results we have obtained in our study.[25] He points out that along with the increase in OHI index values there has been a progressive increase in GI index values in all subjects. Also, he stresses out that during pregnancy the gingiva becomes less effective against inflammatory changes due to local bacteria and dental plaque. With the local bacteria accumulation and poor oral hygiene, the incidence of gingivitis and periodontal changes were confirmed in all subjects.[27]

Dental biofilm accumulates at all available solid tooth surfaces, immediately after its removal by mechanical or chemical substances. If non-pathogenic bacterial flora is isolated in individuals and there is no invasion of potentially pathogenic microorganisms, the development of periodontal inflammation will not occur. However, if dental biofilm accumulates, the initial lesion of gingivitis develops after 24 hours.[28]

Conclusion

The obtained results of the oral hygiene examination and the gingival indices indicate small differences in the examined parameters between the first and third trimester of pregnancy, except that there were differences for Lactobacillus between the examined trimesters. Significant cross-tabulation was found in the ratio between PBI and Lactobacillus in the third trimester. However, timely and appropriate prevention, proper oral hygiene, and change of eating habits are recommended.

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KORELACIJA BAKTERIJA LACTOBACILLUS U SLINI I OHI, PI, GI I PBI INDEKSA U TRUDNICA

S A Ž E T A K

Trudnoća je potpuno novo fiziološko stanje koje potiče važne zaštitne snage buduće majke. Promjene koje se događaju u tijelu trudnice su hormonalne, biokemijske, anatomske i histološke koje se očituju u funkcijama svih organa. Ovo istraživanje obuhvatilo je 66 trudnica u prvoj trudnoći koje žive u Prištini ili dolaze iz obližnjih mjesta na Kosovu. Cilj mu je bio determinirati indeks oralne higijene (OHI), indeks plaka (PI), gingivalni indeks (GI) i indeks interdentalnog gingivalnog krvarenja (PBI) u trudnica u prvom i trećem tromjesečju trudnoće. Količina Lactobacillusa u slini određena je dijagnostičkim testom CRT za određivanje razine bakterija. Rezultati pokazuju da je vrijednost OHI u trećem tromjesečju trudnoće za (p = 0,000) bila značajno viša od vrijednosti u prvom tromjesečju; Vrijednost IDP-a u trećem tromjesečju trudnoće za (p=0,000) bila je značajno viša od vrijednosti u prvom tromjesečju; Vrijednost GI u trećem tromjesečju trudnoće bila je značajno viša nego u prvom tromjesečju p<0,01 (p=0,006); Vrijednost PBI u trećem tromjesečju trudnoće bila je značajno viša nego u prvom tromjesečju (p=0,000). Dobivena je slaba pozitivna korelacija između OHI indeksa i Lactobacillusa u trudnica u prvom i trećem tromjesečju (p>0,05). Korelacija između IDP-a i vrijednosti Lactobacillus u trudnica u prvom i trećem tromjesečju pokazala je slabu pozitivnu vrijednost (p>0,05). Korelacija između GI i vrijednosti Lactobacillusa u trudnica u prvom i trećem tromjesečju pokazala je slabu negativnu beznačajnu korelaciju za Spearman Rank Order R = –0,05 i p> 0,05. Rezultati dobiveni ovim istraživanjem ukazali su na male razlike u ispitivanim parametrima koji su vrlo važni za rano otkrivanje rizika od karijesa i pravovremenu prevenciju.