Original Article

Biochemical Evaluation of Saliva in Pregnant Women, Mirpur AJK

Bushra Kant[1], Aisha Yousaf[1], Asma Hameed[1] and Asnad[2]

ABSTRACT

Objective: The objective of this study to evaluate saliva biochemical composition of pregnant women and non-pregnant women in Mirpur, AJK.

Study Design: Cross-sectional study.

Place and Duration of Study: This study was conducted in the department of Obstetrics and Gynaecology, Mohd ud din Medical College, Mirpur, AJK and Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK from March 2018 to August 2019.

Materials and Methods: We take for study 200 pregnant women patients and 100 health non-pregnant women. We take saliva sample of groups, pregnant women and non-pregnant women and first of determine pH of saliva of both groups by pH meter. Biochemical composition is analyzed by automatic biochemistry analyzer of the both group pregnant women and non- pregnant women.

Results: The result showed that decreased level of calcium if found in pregnant women (0.37 ± 0.17) as compare to non –pregnant women (0.52 ± 0.29). It is also indicating high level of phosphate is found in pregnant women (5.74 ± 3.44) as compare to non-pregnant women (4.55 ± 1.84). We also found low level saliva glucose in pregnant women (0.56 ± 0.45) as compare to non–pregnant women (3.39 ± 4.37) during pregnancy. Low pH or acid environment of oral cavity of pregnant women (6.74 ± 0.28) found as compare to non- pregnant women (7.04 ± 0.27).

Conclusion: The oral pathology or biochemical composition alteration and acidic environment of oral cavity in pregnant women caused dental caries as compare to non-pregnant women. Pregnant women should control the acid environment of oral cavity during pregnancy.

Key Words: Saliva, Biochemical, Pregnant women

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INTRODUCTION

Muscular and skeletal systems, hematological, respiratory and cardiovascular are reflected result of alteration of hormonal changes in pregnancy such as (human chorionic gonadotropin, estrogen and progesterone).[1] In pregnancy; the oral environment is change with alteration in physiological changes. Gingivitis in pregnancy is well known condition. [2, 3]

[1.] Department of Obstet and Gynae, Mohd ud din Medical College, Mirpur, AJK.

[1.] Department of Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK

Correspondence: Dr. Asnad, Associate Professor, Department of Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK
Contact No: 0332-3698204
Email: drasnadkhan@gmail.com

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The studies show that caries rate is high in pregnant women while in non –pregnant women prevalence rate is low, it is showed that oral pathological changes are occurred in pregnant women as compare to non-pregnant women.[4,5] In another study, it is found that cariogenic activity is not increased in pregnancy, while increased normally in non- pregnant women.[6] It show that in pregnant women , high risk factor found for babies with low birth weight and another risk factor is preterm birth, these all due to periodontal diseases in pregnant women.[7,8] If we study the biochemical reports of pregnant women , we found that buffering capacity is occurred in pregnant women as compare to non-pregnant women , and we also found biochemical composition changes in pregnant women as compare to non-pregnant women. [9-15] Many result showed that during pregnancy in women, many biochemical alterations occurred but our concern is oral cavity biochemical changes. The objective of this study to evaluate saliva biochemical composition of pregnant women and non- pregnant women in Mirpur AJK.

MATERIALS AND METHODS

We take for study 200 pregnant women patients and 100 health non- pregnant women. The study was conducted in the department of Obstetrics and gynaecology, Mohd ud din Medical College, Mirpur, AJK and Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK. We take saliva sample of groups, pregnant women and non-pregnant women and first of determined pH of saliva of both groups by pH meter. Biochemical composition is analyzed by automatic biochemistry analyzer of the both group pregnant women and non- pregnant women.

RESULTS

The mean age and literacy did not differ significantly between pregnant and non-pregnant groups.

The result showed that decreased level of calcium if found in pregnant women (0.37 ± 0.17) as compare to non –pregnant women (0.52 ± 0.29). It is also indicating high level of phosphate is found in pregnantwomen (5.74 ± 3.44) as compare to non-pregnant women (4.55 ± 1.84). We also found low level saliva glucose in pregnant women (0.56 ± 0.45) as compare to non –pregnant women (3.39 ± 4.37) during pregnancy. Low pH or acid environment of oral cavity of pregnant women (6.74 ± 0.28) found as compare to non- pregnant women (7.04 ± 0.27).The results of sialometrical and sialochemical analysis show that salivary flow rate is high in pregnant women as compare to non- pregnant women, which is 1.99 ± 0.41 for pregnant women an 1.69 ± 0.45 for non -pregnant women. Salivary sodium levels were significantly reduced in pregnancy in comparison to non-pregnant women.Although α-amylase levels were double as high in pregnant women as compare to non-pregnant women. Statistically significant differences were not observed between pregnant and non-pregnant women.

Table No.1: Participant characteristics

	Pregnant women (n=200)	Non- pregnant women (n=100)
Age (years)	30.54 ± 5.48	30.55 ± 4.38
Education Basic Secondary University	B-50%, S-30%, U-20%	B-49%, S- 32% U-19%
Body weight (Kg)	68.1 ± 11.4	69.4 ± 11.5
BMI (kg/m2)	24.3 ± 2.6	24.4 ± 2.7

B: Basic , S: Secondary , U:University

Table No.2: Saliva biochemical composition of pregnant women and Non- pregnant women

Pregnant women (n=200)	Non-pregnant women (n=100)
Glucose(mg/dl)	
0.56 ± 0.45	3.39 ± 4.37
Calcium, mmol/L	
0.37 ± 0.17	0.52 ± 0.29
Phosphate, mmol/L	
5.74 ± 3.44	4.55 ± 1.84
Sodium, mmol/L	
12.18 ± 10.65	11.77 ± 11.90
pH	
6.74 ± 0.28	7.04 ± 0.27

Table No.3: Saliva analyses ofpregnant womenand Non- pregnant women

Pregnant women (n=200)	Non- pregnant women (n=100)
Salivary flow, mL/min	
1.99 ± 0.41	1.69 ± 0.45
Chloride, mmol/L	
29.98 ± 19.30	34.89 ± 15.89
α-Amylase, U/L	
237.96 ± 405.65	116.89 ± 147.85

DISCUSSION

In the result we found in that the saliva of pregnant women showed acidic non –stimulated environment and we found in saliva decreased level calcium and increases level of phosphate. Result also showed decreased level of glucose during pregnancy. Many result showed that during pregnancy inwomen, many biochemical alteration occurred but our concern is oral cavity biochemical changes. [16-21]We take for study 200 pregnant women patients and 100 health non- pregnant women. The study was conducted in the department of Obstetrics and gynaecology, Mohdud din Medical College, Mirpur, AJK and Biochemistry Department of Mohtarma Benazir Bhutto Shaheed Medical College Mirpur AJK. We take saliva sample of groups, pregnant women and non-pregnant women and first of determind pH of saliva of both groups by pH meter. Biochemical composition is analyzed by automatic biochemistry analyzer of the both group pregnant women and non- pregnant women. Muscular and skeletal systems, hematological, respiratory and cardiovascular are reflected result of alteration of hormonal changes in pregnancy such as (human chorionic gonadotropin, estrogen and progesterone). In pregnancy; the oral environment is change with alteration in physiological changes. Gingivitis in pregnancy is well known condition. The studies show that caries rate is high in pregnant women while in non

–pregnant women prevalence rate is low, it is showed that oral pathological changes are occurred in pregnant women as compare to non-pregnant women. In another study, it is found that cariogenic activity is not increased in pregnancy, while increased normally in non- pregnant women. It show that in pregnant women , high risk factor found for babies with low birth weight and another risk factor is preterm birth, these all due to periodontal diseases in pregnant women.If we study the biochemical reports of pregnant women, we found that buffering capacity is occurred in pregnant women as compare to non-pregnant women , and we also found biochemical composition changes in pregnant women as compare to non-pregnant women. Many result showed that during pregnancy in women, many biochemical alterations occurred but our concern is oral cavity biochemical changes. The acidic environment of oral cavity or decreased pH value of pregnant women is suggested due to high intake of meal daily . It is also suggested that during pregnancy the lower pH of oral cavity if pregnant caused dental caries in pregnant women.[22]It is said in childhood earlystages; high level of phosphate is found in children saliva which caused caries.[23]Result showed, that low potassium level is found in pregnant women in pregnant women at third trimester as compare to non-pregnant women. In our study, we found that α-amylase levels are higher in pregnant women as compare to non-pregnant women. The result showed that decreased level of calcium if found in pregnant women (0.37 ± 0.17) as compare to non –pregnant women (0.52 ± 0.29). It is also indicating high level of phosphate is found in pregnant women (5.74 ± 3.44) as compare to non-pregnant women (4.55 ± 1.84). We also found low level saliva glucose in pregnant women (0.56 ± 0.45) as compare to non –pregnant women (3.39 ± 4.37) during pregnancy. Low pH or acid environment of oral cavity of pregnant women (6.74 ± 0.28) found as compare to non-pregnant women (7.04 ± 0.27). The study showed that in pregnant women the steroid hormone is increased which caused gingival inflammation , and it is also said that in pregnancy gingival bleeding is high and also increased flow of crevicular fluid.[24]

CONCLUSION

The oral pathology or biochemical composition alteration and acidic environment of oral cavity in pregnant women caused dental caries as compare to non-pregnant women. Pregnant women should control the acid environment of oral cavity during pregnancy.

Author's Contribution:

Concept & Design of Study:	Bushra Kant
Drafting:	Aisha Yousaf, Asma Hameed
Data Analysis:	Asnad
Revisiting Critically:	Bushra Kant, Aisha Yousaf
Final Approval of version:	Bushra Kant

Conflict of Interest: The study has no conflict of interest to declare by any author.

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