

# Oral Hygiene and Gestational Age at Delivery; A Cross-Sectional Survey Conducted at a Tertiary Care Hospital

Aliya Imran<sup>1</sup>, Areeba Arif<sup>2</sup>, Somia Jamal<sup>3</sup>, Saadiya Aziz Karim<sup>4</sup>

## Abstract

**Objective:** Assessment of the oral hygiene and addiction habits of postpartum mothers and its relationship with the gestational age at delivery.

**Method:** It was a cross sectional study carried out as a survey of postpartum mothers after having delivered term and preterm newborns. It was conducted between January 2008 - January 2009, at Gynae Unit I of Abbasi Shaheed Hospital and Karachi Medical and Dental College. The total number of postpartum mothers were 189, of which 155 had term delivery and 34 had preterm delivery. The data was collected on a predesigned questionnaire after taking informed verbal consent. The questionnaire included demographics such as age, parity, oral hygiene status, brushing habits, addictions, and gestational age at delivery. All the participants were interviewed and findings were recorded on the questionnaire.

**Results:** The data was entered in SPSS version 20. The mean age of women was  $27:30 \pm 4.75$  years. Of the total 189 postpartum mothers, 106 (56.1%) mothers with term babies had good oral hygiene; 49 (26%) mothers with term babies had poor oral hygiene; 13 (6.9%) mothers with preterm babies had good oral hygiene; and 21(11%) mothers with preterm babies had poor oral hygiene ( $p < 0.0001$ ). In terms of addiction to smokeless tobacco, etc, 41 (21.7%) addict mothers had term babies while 9 (4.8%) addict mothers had preterm babies. Amongst the 139 mothers with no addiction, 114 (60.3%) mothers had term babies while 25 (13.2%) mothers had preterm babies. The p-value came out to be 0.9982 in this regard.

**Conclusion:** This study suggests that poor oral hygiene of mothers is likely to result in preterm delivery of babies.

**Keywords:** Oral hygiene, term birth, preterm birth, postpartum, addiction (ASH & KMDC 20(1):40;2015).

## Introduction

Researchers have found variety of evidence for the relationship of poor oral health and adverse pregnancy outcome<sup>1</sup>. One such outcome is preterm labor. It is one of the most common leading causes of death during the neonatal life; preterm infants are 40 times more likely to die during the neonatal period than compared with full term infants. Furthermore, preterm infants face a higher risk of several

disabilities even after surviving the neonatal period<sup>2</sup>. Studies conducted previously suggest that even though dental interventions during pregnancy do not guarantee consistent results with respect to preterm birth, however, these interventions are regarded as safe and rather necessary to avoid adverse pregnancy outcomes<sup>3</sup>. It is therefore essential to counsel pregnant women about the importance of having good oral hygiene.

The current status of awareness for maintaining good oral hygiene and its maternal and fetal effects is poor amongst the population particularly females. Chewing paan, tobacco and areca nuts has been an old norm in Asian countries<sup>4</sup>. Pakistan is amongst the top fifteen countries of the world

<sup>1,4</sup> Department of Gynaecology and Obstetrics  
Abbasi Shaheed Hospital, Karachi Medical and Dental College  
<sup>2,3</sup> Medical Students,  
Karachi Medical and Dental College

**Correspondence:** Dr. Aliya Imran  
79 Bahadurabad, Block-7/8, little Hut, Karachi.  
Email: draliyaimran@gmail.com

with high usage of tobacco<sup>5</sup>. People tend to eat and chew these things after taking food and meals to help in digestion and changing the taste of mouth. It has been suggested by previous studies<sup>5</sup> that consuming tobacco in any form during pregnancy has a significant effect on the birth weight and health of newborn. However, health hazards are still less common with the consumption of smokeless tobacco than with cigarette smoking<sup>6</sup>.

A study<sup>7</sup> conducted in various cultural backgrounds showed that the Chinese did not use bidis, hookahs or smokeless tobacco. Also, it was unacceptable for Punjabi Sikhs to use tobacco, for Urdu speakers and Sylheti speakers there was no outright taboo, particularly for men, but it was not encouraged. However, the use of paan was common among women and men, in all the cultural background community mentioned above.

Another study<sup>8</sup> conducted in Karachi, Pakistan suggested that the use of chaalia was higher among adolescents than adults while non-married consumed both chaalia and gutka more than married. Mohajir ethnicity had higher prevalence of paan, gutka and tumbaku use while Pathans had higher prevalence of niswar use. Prevalence of use of chewable products is high in Pakistan with particularly high use of certain substances related with socio-demographic profiles. Thus, policies and focused interventions can be developed taking into consideration the preferred use of products among different socio-demographic groups.

It has been observed that apart from using these substances, other factors such as hormonal changes, HIV infections, increased age, low education and low employment status also contribute to poor oral hygiene. Studies suggest that the hormonal changes that take place during pregnancy acts as a modifying factor of pathogenesis of periodontal diseases. Although pregnancy does not cause these periodontal diseases, studies have confirmed higher incidence of gingival inflammation occurring between second and eighth months of pregnancy<sup>9</sup>.

Due to the dearth of data from Pakistan on the factors related to oral hygiene in pregnant mothers and its outcome, we conducted this retrospective cross sectional study, with the objective of assess-

ing the oral hygiene and addiction habits of postpartum mothers and its relationship with the gestational age.

## Subjects and Methods

This study was conducted as a cross sectional study by surveying postpartum mothers after they had delivered term and preterm newborns. It was conducted between January 2008 - January 2009, at Gynae Unit I of Abbasi Shaheed Hospital and Karachi Medical and Dental College. The sample was selected using convenience sampling. The total number of postpartum mothers included in the study was 189. Out of these, 155 mothers have had term delivery and 34 mothers have had preterm delivery. According to the World Health Organization (WHO), an infant born in less than a gestational age of 37 weeks or 259 days after the last menstrual cycle is considered Pre-term or Premature<sup>10</sup>. While an infant born between 38 to 40 weeks was considered to be Full-term or Mature<sup>11</sup>.

A structured questionnaire was used to record various variables that were fitting to the study. These demographic variables included age, parity, oral hygiene status brushing habits, addictions, and gestational age of the postpartum mothers. All the participants of the study were interviewed and examined postnatal following their delivery. Their brushing habits and history of addiction to various items were interviewed in particular. The answers collected were duly recorded in the survey form.

Examining their oral cavity and teeth did the assessment of the oral hygiene of postpartum females. Presence of Plaque and calculus and dental caries, gingivitis, halitosis (bad smell), brushing methods and addiction habits were noted on structured questionnaire.

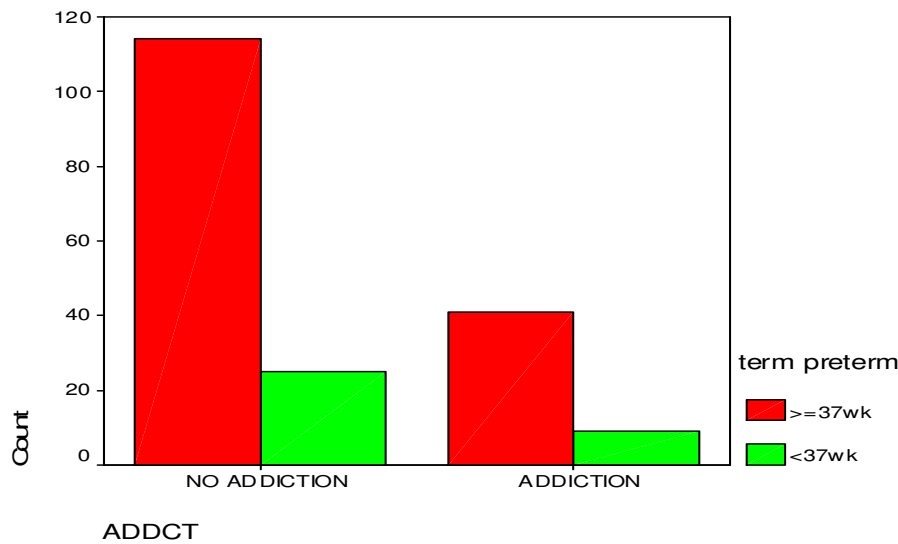
## Results

The data that was collected through the questionnaire was entered in SPSS version 10 for statistical analysis. The mean age of women came out to be  $27:30 \pm 4.75$  years.

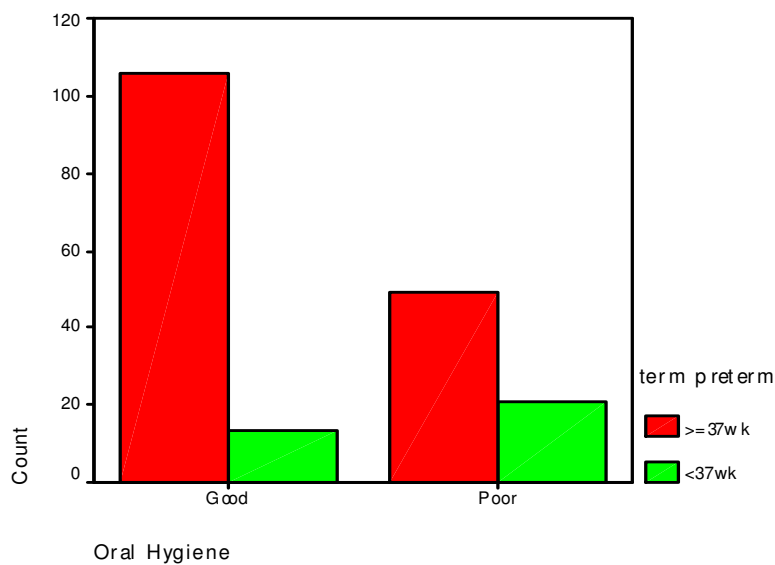
In terms of good or poor oral hygiene, it was observed that out of a total of 155 mothers who have had term babies, 106 (56.1%) had good oral

**Table 1.** Statistical analysis of Oral Hygiene and addiction in term / preterm mothers

Total (n=189)	Mothers with preterm babies 17.9% (n=34/189)	Mothers with term babies 82% (n=155/189)	p-value
Good Oral Hygiene (n=119)	6.9% (n=13/189)	56.1% (n=106/189)	<0.0001
Poor Oral Hygiene (n=70)	11% (n=21/189)	26% (n=49/189)	
Addiction (n=50)	4.8% (n=9/189)	21.7% (n=41/189)	0.9982
No Addiction (n=139)	13.2% (n=25/189)	60.3% (n=114/189)	



**Fig. 1.** Relation of term/preterm with addiction



**Fig. 2.** Relation of term/preterm deliveries with good or poor oral hygiene

hygiene. 49 (26%) mothers with term babies had poor oral hygiene. On the other hand, out of the 34 mothers with preterm babies, 13 mothers (6.9%) had good oral hygiene while 21 (11%) mothers had poor oral hygiene. The p-value in this regard was calculated to be  $<0.0001$  (Table 1).

The results of addiction habits revealed that out of a total of 50 (26.5%) addicted mothers, 41 (21.7%) mothers had term babies while 9 (4.8%) mothers had preterm babies. While in 139 (73.5%) non-addicted mothers, 114 (60.3%) had term babies while 25 (13.2%) had preterm babies. The p-value came out to be 0.9982 (Table 1).

## Discussion

This study was conducted keeping under consideration the increase in prevalence of poor oral hygiene and unhealthy addictions especially in the female population of the region<sup>5</sup>. Several addictions and usage of improper brushing methods led the authors to conduct this study, in order to assess the outcome of pregnancies i.e., preterm or term newborn, and their relationship with the oral hygiene of mothers.

Although there are some conflicting findings and potential problems regarding uncontrolled underlying risk factors, most of the clinical studies indicate a positive correlation between periodontal disease and preterm birth<sup>1</sup>. Recent studies also have shown that there are microbiologic and immunological findings that strongly support the association. The studies conducted previously indicate that periodontal infection can lead to placental-fetal exposure and, when coupled with a fetal inflammatory response, can lead to preterm delivery<sup>12</sup>. It may also exacerbate Osteoporosis, Diabetes Mellitus, Cardiovascular and Respiratory diseases, elevated risk of cerebrovascular attacks along with preterm labor<sup>2,13</sup>.

Women with periodontal pathogenesis stand at higher risk of frequent and severe bacteremia predominantly Gram-negative than periodontally healthy women. Such mothers have been demonstrated to perturb the physiologic course of parturition through inflammatory cytokine production, sometimes resulting in preterm labor, premature rupture of membranes, preterm low birth weight<sup>14</sup> as well as

miscarriage and preeclampsia<sup>15</sup>. When dealing with addictions, the results of this study have been seen to indicate that betel quid additives might significantly enhance periodontitis in the population studied<sup>16</sup>. Moreover; caries incidence could also be virtually eliminated by the regular meticulous professional removal of plaque, use of fluoride and regular dental check-up for scaling, fluoride application & sealants<sup>17</sup>.

Changes in clinical parameters during pregnancy are reversible; indicating that pregnancy gingivitis does not predispose or proceed to periodontitis<sup>18</sup>. Treatment of periodontitis in pregnant women improves periodontal disease and is safe but does not significantly alter rates of preterm birth, low birth weight, or fetal growth restriction<sup>19</sup>.

Furthermore, studies of the past have established a vital relationship between socio-economic status and oral health<sup>20</sup>. High caries prevalence and better oral hygiene is seen in high societies, whereas in low social classes caries occurrence is not high but oral hygiene is very poor. This fact has been duly supported by the result of this study as well, as most of the mothers who were examined belonged to low social class. Also, education and occupation also have an impact on oral health and their relationship is reciprocal<sup>21</sup>.

In this study, majority of mothers with term newborns had good teeth and gums, a habit of brushing with toothpaste, and majority were not addicted to any unhealthy habit. However, mothers who had delivered preterm infants had poor oral hygiene, but only a few were also seen to be addicted to tobacco, chalia, niswar Fig.1&2. In addition to this, fewer mothers with preterm deliveries brushed teeth with toothpaste, as compared to term post-partum mothers.

It is recommended that large, prospective cohort studies need to be conducted to assess risk for adverse pregnancy outcome in populations with periodontal disease and poor oral hygiene. It is critical that periodontal exposure and adverse birth outcomes be clearly defined and the many potential confounding factors and possible effect modifiers for adverse pregnancy outcome be controlled in these studies<sup>22</sup>. It is also recommended that community based awareness programmes should be planned in

order to aware the mothers and females regarding their oral hygiene and brushing habits. Addiction habits must always be discouraged in every walk of life.

### Conclusion

Poor oral hygiene may lead to preterm delivery and low birth weight infants. It is necessary to guide pregnant as well as non-pregnant females regarding the importance of their oral hygiene habits, so as to avoid complications in the future.

### Conflict of Interest

The author has no conflict of interest and no funding or grant from any organization.

### Acknowledgement

We acknowledge the help of Dr. Ashraf Jehangir for helping with the statistical analysis of this paper. We are also thankful to Dr. Mehwash Kashif for her insightful comments and expert dental advice during the revision of this paper.

### References

- 1- Han YW. Oral health and adverse pregnancy outcomes - what's next? *J Dent Res* 2011;90:289-93.
- 2- Zadeh-Modarres S, Amooian B, Bayat-Movahed S, Muhammadi M. Periodontal health in mothers of preterm and term infants. *Taiwan J Obstet Gynecol* 2007;46:157-61.
- 3- Kloetzel MK, Huebner CE, Milgrom P. Referrals for dental care during pregnancy. *J Midwifery Womens Health* 2011;56:110-7.
- 4- Changrani J, Gany F. Paan and Gutka in the United States: an emerging threat. *J Immigr Health* 2005;7:103-8.
- 5- Das CM, Ghori A, Khursheed F, Zaheen Z, Sharma M. Frequency, Knowledge and Practice of Tobacco Smoking in Pregnant Women at out Patient Department of a Tertiary Care Hospital. *JLUMHS* 2012;11:176-9.
- 6- Critchley JA, Unal B. Health effects associated with smokeless tobacco: a systematic review. *Thorax* 2003;58:435-43.
- 7- Hanna L, Hunt S, Bhopal RS. Cross-cultural adaptation of a tobacco questionnaire for Punjabi, Cantonese, Urdu and Sylheti speakers: qualitative research for better clinical practice, cessation services and research. *J Epidemiol Community Health* 2006;60:1034-39.
- 8- Mazahir S, Malik R, Maqsood M, Merchant KA, Malik F, Majeed A, et al. Socio-demographic correlates of betel, areca and smokeless tobacco use as a high risk behavior for head and neck cancers in a squatter settlement of Karachi, Pakistan. *Subst Abuse Treat Prev Policy* 2006;26:10.
- 9- Wandera M, Astrom AN, Okullo I, Tumwine JK. Determinants of periodontal health in pregnant women and association with infants anthropometric status: a prospective cohort study from Eastern Uganda. *BMC Pregnancy Childbirth* 2012;12:12-90.
- 10- Cruvinel VR, Gravina DB, Azevedo TD, Rezende CS, Bezerra AC, Toledo OA. Prevalence of enamel defects and associated risk factors in both dentitions in preterm and full term born children. *J Appl Oral Sci* 2012;20:31
- 11- In: Beckman CR, Ling FW, Barzansky BM, Herbert WN, Laube DW, Smith RP. *Obstetrics and Gynecology*. 6th Ed. Baltimore: Lippincott William and Wilkins; 1951. p. 201
- 12- Bobetsis YA, Barros SP, Offenbacher S. Exploring the relationship between periodontal disease and pregnancy complications. *J Am Dent Assoc* 2006;137:7S-13S.
- 13- Mannem S, Chava VK. The relationship between maternal periodontitis and preterm low birth weight: A case control study. *Contemp Clin Dent* 2011;2:88-93.
- 14- Carta G, Persia G, Falciqlia K, Lovenitti P. Periodontal disease and poor obstetrical outcome. *Clin Exp ObstetGynecol* 2004;31:47-9.
- 15- Xiong X, Buekens P, Fraser WD, Beck J, Offenbacher, S. Periodontal disease and adverse pregnancy outcomes: a systematic review. *BJOG* 2006;113:135-43.
- 16- Akhter R, Hassan NM, Aida J, Takinami S, Morita M. Relationship between betel quid additives and established periodontitis among Bangladeshi subjects. *J Clin Periodontol* 2008;35:9-15.
- 17- Rehman MM, Mahmood N, Rehman B. The relationship of caries with oral hygiene status and extra-oral risk factors. *J Ayub Med Coll Abbottabad* 2008;20:103-8.
- 18- Gürsoy M, Pajukanta R, Sorsa T, Könönen E. Clinical changes in periodontium during pregnancy and post-partum. *J Clin Periodontol* 2008;35:576-83.
- 19- Michalowicz BS, Hodges JS, DiAngelis AJ, Lupo VR, Novak MJ, Ferguson JE, et al. Treatment of periodontal disease and the risk of preterm birth. *N Engl J Med* 2006;355:1885-94.
- 20- Bommireddy VS, Pachava S, Ravoori S, Sanikommu S, Talluri D, Vinnakota NR. Socio-economic Status, Needs, and Utilization of Dental Services among Rural Adults in a Primary Health Center Area in Southern India. *J Int Oral Health* 2014;6:56-60.
- 21- Bokhari SA. Lifestyle Impact on Oral Health. *Pak J Med Sci* 2006;22:336-7.
- 22- Wimmer G, Pihlstrom BL. A critical assessment of adverse pregnancy outcome and periodontal disease. *J Clin Periodontol* 2008;35:380-97.