

Oral Health among Women – A Cross-sectional Study from South India

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Abstract Objective: To evaluate oral health among women which would provide a baseline data to develop preventive and educational programmes. Material and methods: A cross-sectional study was carried out within the municipal corporation limits of Udupi district among women attending/visiting government and private hospital for antenatal check-up, check-up for their new born or the accompanying persons visiting the hospitals. Age, type of health care system, previous pregnancy was collected at the time of enrollment in the study. This was followed by recording of Community Periodontal Index and Loss of Attachment (CPI and LOA) for periodontal diseases and Decayed, Missing, Filled Tooth (DMFT) Index for dental caries. Results: A total of 1004 women (508 government and 496 private hospital) participated in this study. There was a significant difference in the periodontal status (mean CPI and LOA) among the three types of women ($p < 0.001$ and < 0.001). Post-hoc analysis showed that the expectant mothers had highest mean CPI and LOA followed by mothers with least mean score in non-pregnant women. There was a significant difference in the caries status (mean DT, MT, DMFT) among the three types of women ($p = 0.02$, < 0.001 and < 0.001) however, no significant difference was seen with respect to mean filled tooth (FT). Post-hoc analysis showed that the expectant mothers and mothers had higher mean DT than non – pregnant women. Interestingly, it was seen that mothers had higher mean MT than expectant mothers and non-pregnant women. The overall mean DMFT score was significantly higher for mothers followed by expectant mothers with least being in non-pregnant women. Conclusion: A clear understanding of hormonal changes and its role in oral health and disease is needed for all the health care providers. Women in the reproductive age and who were expecting pregnancy should have thorough oral health screening and treatment.

Keywords: oral health, caries, periodontitis, pregnant, women

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1. Introduction

Women's health was defined as diseases or conditions that are unique to, more prevalent or more serious in women; have distinct causes or manifest themselves differently in women; or have different outcomes or require different interventions than men. [1] This definition encompasses oral diseases and conditions. Various stages in women's lifelike puberty, menstrual cycles, pregnancy, menopause and the use of contraceptive medications can influence women's oral health. Because of the surprisingly strong influence of hormonal fluctuations on the oral cavity, women have special oral health needs and considerations [2].

The Institute of Medicine's Report in 2001 focused international attention on gender-based biology and its implications for women's health. This report stated that, understanding the roles of sex and gender in biology,

scientists can better understand these effects on disease, prevention and treatment [2].

The State of the World's Mothers (SOWM) 2011, brought out by Save the Children, the international non-governmental organization, reports that the countries where mothers are most at risk are also the countries which fare poorly in many other areas — women's health, education, economic and political status and children's well-being. In millions of homes across the country, girls are fed less and educated less because they are not seen as assets. Considering the poor general health status of the mothers, it is plausible that the oral health might also be compromised [3].

Numerous studies exist in the literature assessing the gingival and periodontal diseases, [4-15] dental caries, [14,15,16,17] oral health related quality of life [18,19,20] and dental service utilization [21,22] among pregnant and post-partum women. But the literature comparing oral health among non-pregnant women, expectant mothers and mothers of newborns and children appears seemingly scant. In view of the lacking data it is worthwhile to assess

condition of oral health among these women. The current study aimed to evaluate oral health status among these women which would provide a baseline data to develop preventive and educational programmes.

2. Materials and Methods

A cross-sectional study was carried out within the municipal corporation limits of Udupi district during the months of October to December 2009. This study population consisted of women of Udupi district who were attending/visiting government and private hospital for antenatal check-up, check-up for their new born or the accompanying persons visiting the hospitals. The study area has a literacy rate of 86.29% with a favorable sex ratio of 1093 females for every 1000 males. The sample size was calculated on the basis of pilot study results. Prevalence of 29% for decayed teeth and 75% for periodontal diseases was reported from the pilot study. Based on these prevalence rates, with an absolute precision of 4% and confidence interval of 95%, the final sample constituted to be 495 for decayed teeth and 451 for periodontal diseases. Hence the sample size was rounded to 500 subjects in each site of the survey.

Health care delivery in the study area is mainly provided by 2 major hospitals, one is managed by the government of India and the other is a privately managed teaching hospital. Both these hospitals cater the health care needs for low and middle income population. The present study was conducted in both these hospitals and a total of 500 subjects in each hospital were surveyed for recording oral health status. A systematic random sampling was done by selecting every 3rd individual who entered the out-patient departments at these respective hospitals. If particular individual was not interested in participating then the next individual was invited and similar technique was followed hence worth, to ensure random sample selection. The study was approved by University Ethics Committee, Manipal University, Manipal. Informed consent was sought from all the participants. Inclusion criteria were that women aged 18-35 years, willing to participate, and no associated systemic health conditions which might alter the presentation of oral diseases.

Socio demographic information like age, type of health care system, Socio-economic status, previous pregnancy was collected at the time of enrollment in to the study. This was followed by oral examination as per recommended WHO guidelines for oral health surveys under natural day light using mouth mirror and CPI probes. The indices recorded were Community Periodontal Index and Loss of Attachment (CPI and LOA) for periodontal diseases and Decayed, Missing, Filled Tooth (DMFT) Index for dental caries (WHO, 1997). [23] Clinical examination was done by one calibrated examiner and intra-examiner reliability (Kappa coefficient) ranged from 0.85-0.9 suggesting an acceptable agreement between the observations. A recording clerk assisted the examiner in recording the observations throughout the study.

2.1. Statistical Analysis

All analysis was done by PASW 18 version software. A p-value of <0.05 was set to be statistically significant.

ANOVA with post-hoc test was used to compare the mean scores of the population.

3. Results

The women were cluster classified into three categories viz., non-pregnant, expectant mothers and mothers of newborns and children from both government and private hospitals. The mean age of the study population was 25.97 ± 4.20. A total of 508 and 496 women from government and private hospital participated in this study. Majority of the participants had high school (39.4%) or college and above educational level (40.8%). A total of 256, 501 and 247 non-pregnant, expectant mothers and mothers have participated in our study.

There was a significant difference in the periodontal status (mean CPI and LOA) among the three types of women ($p < 0.001$ and < 0.001). Post-hoc analysis showed that the expectant mothers had highest mean CPI and LOA followed by mothers with least mean score in non-pregnant women. There was a significant difference in the caries status (mean DT, MT, DMFT) among the three types of women ($p = 0.02$, < 0.001 and < 0.001) however, no significant difference was seen with respect to mean filled tooth (FT). Post-hoc analysis showed that the expectant mothers and mothers had higher mean DT than non – pregnant women. Interestingly, it was seen that mothers group had higher mean MT than expectant mothers and non-pregnant women. The overall mean DMFT score was significantly higher for mothers followed by expectant mothers with least being in non-pregnant women.

4. Discussion

Our study highlighted the different levels of oral health among these women of Udupi district. Due to the strong influence of hormonal fluctuations on the oral cavity, women have special oral health needs and considerations.

It was seen that the periodontal health was poor among the expectant mothers than mothers and non-pregnant women. It was reflected by lower mean score of CPI and LOA among the non-pregnant women which suggests that there could be a possible role of hormones during the pregnancy which aggravates the local tissue response independent of local irritants like plaque and calculus. This was similar to the pattern reported by numerous studies on pregnant women who reported gingivitis with increased probing depths (Miyazaki et al. 1991; [9] Raber-Durlacher et al. 1994; [25] Taani et al. 2003 [26]). Some levels of loss of attachment may occur which doesn't revert after delivery (Cohen et al. 1969) [27] while recent longitudinal study reported that that pregnancy does not necessarily result in irreversible periodontal breakdown. [28] Along with these changes during pregnancy, other systemic conditions like type-1 diabetes mellitus seems to increase periodontal destruction (Guthmiller et al. 2001) [24].

The mean DT was significantly higher in expectant mothers and mothers which might be due to change in dietary patterns, salivary pH and buffering capacity, hormonal changes. These changes in pregnancy would have been reflected in mothers group also which would

reflect as higher DT. The mean MT was significantly higher in mothers group than expectant mothers and non-pregnant women. This might be due to other disease factors like periodontitis that might be aggravated due to pregnancy, age and other systemic and local factors. The significant increase in DT and MT might have reflected in the overall DMFT score.

A lot of factors come into play when we discuss the oral health in women viz., type of oral hygiene practices, systemic illness and health, nutritional deficiencies, differences in metabolism, hormonal variations, aggravated tissue response to local irritants, impaired immunity, increased dietary intakes (refined carbohydrates) etc. Women who would have had good oral hygiene practices and other factors may not necessarily carry out the same during and after pregnancy. Changes in local tissue response and immunity also have a potential role along with the above factors. Hence, it might be difficult

to arrive at a conclusion whether the pregnancy alone causes the deterioration in oral health. Like any other oral disease, oral health and disease essentially a multifactorial process which might alter during pregnancy. One must understand the fact that the periodontal and dental caries status is poor in expectant mothers. If appropriate care and attention is not provided during this phase, it might lead more tissue destruction which was clearly reflected in our study.

A clear understanding of hormonal changes and its role in oral health and disease is needed for all the health care providers. Women in the reproductive age and who were expecting pregnancy should have thorough oral health screening and treatment. It is necessary to screen pregnant women for oral conditions during and after pregnancy to have better oral health related quality of life. Health care providers are recommended to advise all the women for regular dental visits.

Table 1. Comparison of periodontal and caries indices among the study groups

Clinical entity	Index	Non Pregnant [1] Mean \pm SD (N=256)	Expectant Mothers [2] Mean \pm SD (N=501)	Mothers [3] Mean \pm SD (N=247)	p-value	Post-hoc test
Periodontal assessment	CPI	1.95 \pm .80	2.65 \pm .90	2.40 \pm .96	<0.001	2>3>1
	LOA	0.63 \pm .64	1.04 \pm .70	0.87 \pm .61	<0.001	2>3>1
Caries assessment	DT	2.52 \pm 2.12	3.02 \pm 2.61	3.05 \pm 2.65	0.02	2,3>1
	MT	0.68 \pm 1.42	0.96 \pm 2.47	1.96 \pm 2.74	<0.001	3>1,2
	FT	0.42 \pm 1.32	0.47 \pm 1.31	0.64 \pm 1.26	0.135	-
	DMFT	3.62 \pm 2.99	4.44 \pm 3.68	5.65 \pm 3.73	<0.001	3>2>1

References

- [1] U.S. Public Health Service. 1985. Report of the Public Health Service Task Force on Women's Health Issues. Public Health Reports 100: 73-106.
- [2] Carpenter W, Glick M, Nelson SR, Roser SM, Patton LL. Women's oral health issues -2006; 11.
- [3] Champions for Children: State of World's Mother 2012.
- [4] Galloway C. Focal infection American journal of Surgery. 1931; 14: 643-5.
- [5] Loe H and Silness J. Periodontal disease in pregnancy: Prevalence and severity. Acta Odontologica Scandinavica 1963; 21: 533-551.
- [6] Cohen DW, Friedman L, Shapiro J and Kyle GC. A longitudinal investigation of the periodontal changes during pregnancy. J Periodontol 1969; 40: 563-570.
- [7] Samant A, Malik CP, Chabra SK and Devi PK. Gingivitis and periodontal disease in pregnancy. J Periodontol 1976;47:415-418.
- [8] Arafat AH. Periodontal status during pregnancy. J Periodontol 1974; 45: 641-643.
- [9] Miyazaki H, Yamashita Y, Goto-Kimura K et al. Periodontal condition of pregnant women assessed by CPITN. J ClinPeriodontol 1991; 18: 751-4.
- [10] Malisa JE, Moshia HJ, Masalu JR. Periodontal status of pregnant and postpartum mothers aged 18-45 years attending MCH clinics in Tanga Municipality, Tanzania. East Afr Med J 1993; 70: 799-802.
- [11] Nuamah I and Annan BD. Periodontal status and oral hygiene practices of pregnant and non-pregnant women. East Afr Med J 1998 Dec; 75(12): 712-4.
- [12] Tilakaratne A, Soory M, Ranasinghe AW, Corea SMX, Ekanayake SL, De Silva, M. Periodontal disease status during pregnancy and 3 months post-partum, in a rural population of Sri-Lankan women. J ClinPeriodontol 2000; 27: 787-792.
- [13] Lief S, Boggess KA, Murtha AP, et al. The Oral Conditions and Pregnancy Study: Periodontal Status of a Cohort of Pregnant Women. J Periodontol 2004; 75:116-126.
- [14] Mumghamba EGS, Manji KP, Michael J. Oral hygiene practices, periodontal conditions, dentition status and self-reported bad mouth breath among young mothers, Tanzania. Int J Dent Hygiene 2006; 4: 166-173.
- [15] Tadakamadla SK, Agarwal P, Jain P, Balasubramanyam G, Duraiswamy P, Kulkarni S, et al. Dental status and its socio-demographic influences among pregnant women attending a maternity hospital in India. Rev ClinPesqOdontol 2007; 3: 183-192.
- [16] Jago JD, Chapman PJ, Aitken JF, McEnery TM Dental status of pregnant women attending a Brisbane maternity hospital. Community Dent Oral Epidemiol 1984; 12: 398-401.
- [17] Radnai M, Gorzó I, Nagy E, Urbán E, Eller J, Novák T, Pál A. The oral health status of postpartum mothers in South-East Hungary. Community Dent Health 2007; 24, 111-116.
- [18] de Oliveira BH, Nadanovsky P. The Impact of Oral Pain on Quality of Life during Pregnancy in Low-Income Brazilian Women. J Orofac Pain 2006; 20: 297-305.
- [19] Acharya S, Bhat PV, Acharya S. Factors affecting oral health-related quality of life among pregnant women. Int J Dent Hygiene 2009; 7: 102-107.
- [20] Acharya S, Bhat PV, Oral-Health-Related Quality of Life during Pregnancy. J Pub Health Dent 2009; 69: 74-77.
- [21] Mangskau KA, Arrindell B. Pregnancy and oral health: utilization of the oral health care system by pregnant women in North Dakota. Northwest Dent 1996; 75: 23-28.
- [22] Natalie JT, Philippa FM and Caroline AC. Oral and dental health care practices in pregnant women in Australia: a postnatal survey. BMC Pregnancy and Childbirth 2008, 8:13.
- [23] World Health Organization. Oral health surveys - Basic methods. 4thed. Geneva 1997.
- [24] Guthmiller JM, Hassebroek-Johnson JR, Weenig DR, Johnson GK, Kirchner HL, Kohout FJ, Hunter SK. Periodontal disease in pregnancy complicated by type 1 diabetes mellitus. JPeriodontol 2001; 72: 1485-90.
- [25] Raber-Durlacher JE, van Steenberghe TJ, van der Velden U, de Graaff J, Abraham-Impijn L. Experimental gingivitis during pregnancy and post-partum: clinical endocrinological, and microbiological aspects. J ClinPeriodontol 1994; 21: 549-58.
- [26] Taani DQ, Habashna R, Hammad MM, Butieha A. The periodontal status of pregnant women and its relationship with socio-demographic and clinical variables. J Oral Rehab 2003; 30: 440-445.
- [27] Cohen D, Friedman L, Shapiro J and Kyle G. A longitudinal investigation of periodontal changes during pregnancy. J Periodontol 1969; 40: 563-570.
- [28] Gursoy M, Pajukanta R, Sorsa T, Könönen E. Clinical changes in periodontium during pregnancy and post-partum. J ClinPeriodontol 2008; 35: 576-583.