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### Oral health and adverse pregnancy outcomes: Perceptions of practising gynaecologist in Bangalore city: A cross-sectional study

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#### Abstract

Gynaecologists are first health professionals to contact the pregnant woman, it is vital for them to be aware of potential effect of oral health on pregnancy outcomes. Aim was to assess the perception and practice regarding oral health care among Gynaecologists and evaluate factors associated with it. A cross-sectional study was carried out among 160 Gynaecologists in Bangalore during March-June 2016. Data were collected using self-administered structured questionnaire. Descriptive statistics, independent t-test and z test for proportion were used. Majority of study participants exhibited adequate knowledge (53.4%). Thirteen percent performed oral examination of the pregnant women. There was no statistically significant difference between age, type of practice and years of practice for knowledge and practice scores. Gynaecologist had fair knowledge but their preventive oral health practice is inadequate. Hence, there is need for a coordinated interdisciplinary effort for better oral health outcomes and prevention of adverse pregnancy outcomes.

**Keywords:** gynaecologist, India, oral health, perception, pregnancy

#### 1. Introduction

Oral health is very important issue for pregnant woman as well as her child [1]. There is a budding body of knowledge that supports oral health and pregnancy outcomes [2, 3, 4]. Offenbacher *et al* reported in 1996 that periodontal disease was a potential risk factor for preterm birth [5, 6]. Since then, the relationship between periodontal disease and preterm birth has been one of the enigma in dental research. Periodontal disease is a chronic inflammatory disease caused by bacteria [2, 7] that might result in systemic abnormal immunological changes. Moreover oral bacteria can directly colonize the placenta, causing localized inflammatory responses, resulting in adverse pregnancy outcomes [6]. Hence, Oral health care needs should be addressed in pregnant women by a multi-professional approach and should be incorporated into their health promoting strategies and practices [8]. However health care professionals tend to pay less attention for oral conditions in pregnant women [1].

Gynaecologists are important health professionals to care the pregnant woman and treat them throughout their term. With growing literature of finding relationship between oral health and pregnancy, it is crucial for them to know the impact of oral health and its associated risk factors on pregnancy outcomes. Studies have assessed Gynaecologists' perception and practice behaviors regarding oral health care during pregnancy. In a study gynaecologists did not apply their knowledge about the association between periodontal disease and adverse pregnancy outcomes in their practice [9]. Perception of Gynaecologist is crucial in the implementation and eventual success of early oral health preventive programs targeted towards pregnant women [8]. India has the highest incidence of prematurity and low birth weight [10]. Studies pertaining to Gynaecologist perceptions about oral health care are limited. Therefore, this study was conducted with an aim to assess Gynaecologists perception and practices regarding oral health care and evaluate factors associated with it in Bangalore, India.

#### 2. Materials and methods

A cross-sectional questionnaire study was conducted among Gynaecologists in Bangalore city,

Karnataka (India) during March-June 2016. The study protocol was approved by the Institutional Ethical Committee prior to the commencement of the study.

A pilot study was conducted on thirty Gynaecologists to know the feasibility of the study and to calculate the sample size for the study. Sample size was calculated by the formula:  $Z2pq/\delta^2$  Where:  $Z=1.96$ ,  $p=0.88$ ,  $q=0.12$ ,  $\delta=0.05$  (margin of error), the sample size was arrived at 160.

Internal consistency (Cronbach's alpha) for the questionnaire was found to be 0.80. The acceptability of the questionnaire was evaluated by asking study participants ease of answering the questionnaire and duration to complete it. Based on the pilot study, necessary modifications were done in the study proforma.

A list of government and private medical colleges and hospitals, comprehensive centers/polyclinics and maternity care centers was obtained from Rajiv Gandhi University of Health Sciences website<sup>[11]</sup> and Karnataka medical products and service directory, Yellow pages<sup>[12]</sup>. A total of 160 gynaecologists were selected randomly from the list after dividing the Bangalore city into four zones. Gynaecologists present on the day of study and voluntary giving consent were included.

The questionnaire was divided into four sections which comprised series of questions related to socio-demographic, perceptions regarding oral health during pregnancy, practice in regard to preventive measures for oral care and source of information about oral diseases. Data was collected through personal visits to each of these facilities. Study participants were asked to complete the questionnaire after taking consent which were collected back immediately. The majority of participants took 5-10 minutes to complete the questionnaire. Data obtained from the questionnaire were analyzed using SPSS version 18 (IBM Corporation, SPSS Inc., Chicago, IL, USA) and VassarStats<sup>[13]</sup>. The frequency for each domain of knowledge and practice was calculated after giving weight for each option. Statistical t-test and z test for proportion were used between various factors. The level of significance was set at  $p<0.05$ .

### 3. Results & Discussion

A total of 150 responded from 160 gynaecologists (93.7 % response rate). Mean age of the gynaecologists was  $40.32\pm 8.28$  years. The majority of respondents were females (90 %) and worked in private (72 %). More than two-thirds of the gynaecologist (81.3%) had practice for less than 20 years. ("Table 1")

Forty percent of the gynaecologist's came across oral health problems among pregnant women. While fifteen percent of the gynaecologists said that pregnant patients reported with bleeding gums or tooth mobility. Thirty-three percent of the gynaecologists' received referrals from dental surgeons for an opinion regarding dental treatment and the similar proportion of the gynaecologist (32%) referred pregnant women for dental check-up.

Eighty-eight percent of the gynaecologist perceived that oral health is part of prenatal care. Most of them observed

worsening of bleeding gum (59.3%) and swollen gums (60.7%) during pregnancy and appreciated the role of periodontal disease in preterm delivery ("Table 2"). Overall more than half of the study participants exhibited adequate knowledge.

The majority of the gynaecologists opined that dental care could be provided during pregnancy (80%) with second trimester (60.7%) and oral prophylaxis (74%) being safest. Whereas others also felt that extraction (28.6%), simple restoration (24.7%) and root canal treatment (12.7%) to be safe during pregnancy. Majority of them (91.3%) ascertained the use of local anesthesia to carry out dental treatment during pregnancy while the use of general anaesthesia was endorsed by a smaller proportion of the respondents (16.7%).

A Smaller proportion of the gynaecologists performed oral examination (13%) of the pregnant women. The majority of the study participants advised brushing (62%) followed by mouth rinsing (30%) and flossing (10%).

Thirty-eight percentage of gynaecologist said that undergraduate training is the source of learning regarding oral health followed by post-graduate training (18.6%) and Continuing Medical Education programme (16.7%). Sixty-two percentage of gynaecologist stated that medical/dental journals were the main source of oral health information followed by books, magazines, and clinical experience.

The study sample was dichotomised based on factors such as age, gender, type and years of practice to know the factors affecting knowledge and practice of the gynaecologist about oral health. There was no significant difference in the knowledge of gynaecologists about oral health care based on age, gender, type and years of practice ("Table 3"). There was no statistically significant difference between age, type of practice and years of practice were observed for practice variables such as performing an oral examination, dental visits, and oral hygiene practices. Gender wise significant differences in practice of oral health were observed for advising dental visits and use of dental floss. ("Table 4")

### 3.1 Tables

**Table 1:** Demographic distributions of study participants (N=150)

Characteristics	Study sample	
	Frequency	Percentage
Age (years)		
<40	79	52.7
>40	71	47.3
Gender		
Male	14	9.3
Female	135	90.0
Type of practice		
Government	42	28.0
Private	108	72.0
Years of practice		
<20	122	81.3
>20	28	18.7

**Table 2:** Knowledge of gynaecologist about oral health (gingival/periodontal infection) during pregnancy

Knowledge statement	Yes N (%)	No N (%)
Oral health care is a part of prenatal care	132(88.0)	18(12.0)
Hormonal changes during pregnancy hinder the body's ability for repair of soft tissue	101(67.3)	49(32.6)
Prevalence and severity of dental caries increase during pregnancy	51(34.0)	99(66.0)
Bleeding gums worsens during pregnancy	89(59.3)	61(40.6)
Swollen gums worsens during pregnancy	91(60.7)	58(38.7)
Tooth loss occurs or worsens during pregnancy	24(16.0)	126(84.0)
Calcium will be drawn out of your teeth by the developing baby?	52(34.7)	98(65.4)
Periodontal disease leads to preterm delivery	94(62.7)	56(37.3)
Periodontal disease leads to low birth weight	43(28.7)	107(71.3)
Pregnant patients should delay visit to the dentist until after pregnancy?	10(6.7)	140(93.3)

**Table 3:** Factors affecting knowledge of gynaecologist about oral health care

Factors	Mean $\pm$ SD	p value
Age (years)		
< 40	4.66 $\pm$ 1.86	0.72
>40	4.55 $\pm$ 1.92	
Gender		
Male	4.50 $\pm$ 1.73	0.82
Female	4.62 $\pm$ 1.82	
Type of practice		
Government	4.74 $\pm$ 2.06	0.60
Private	4.56 $\pm$ 1.84	
Years of practice		
<20	4.54 $\pm$ 1.77	0.21
>20	5.04 $\pm$ 2.31	

**Table 4:** Factors affecting practice of gynaecologist about oral health care

Factors	Performing oral examination	Dental visits	Toothbrush practice	Dental floss practice	Mouth rinse practice
Age (years)					
< 40	7 (8.86)	9 (11.39)	53 (67.08)	6 (7.59)	19 (24.05)
>40	13 (18.30)	11 (15.49)	41 (57.74)	9 (12.67)	26 (36.62)
p value	0.08	0.46	0.23	0.30	0.09
Gender					
Male	2 (14.28)	3 (21.42)	9 (64.28)	4 (28.57)	6 (42.85)
Female	18 (13.33)	17 (12.59)	85 (62.96)	11 (8.14)	39 (28.88)
p value	0.12	0.02*	0.61	0.001**	0.27
Type of practice					
Government	4 (9.5)	6 (14.28)	27 (64.28)	3 (7.14)	14 (33.33)
Private	16 (14.81)	14 (12.96)	67 (62.03)	12 (11.11)	31 (28.70)
p value	0.64	0.83	0.79	0.89	0.57
Years of practice					
<20	15 (12.29)	17 (13.93)	80 (65.57)	12 (9.83)	36 (29.50)
>20	5 (17.85)	3 (10.71)	13 (46.42)	3 (10.71)	9 (32.14)
p value	0.43	0.59	0.05	0.22	0.78

\* p &lt; 0.05

\*\* p &lt; 0.001

#### 4. Discussion

Mean age of the study participants is consistent with one study [8]. The majority of them were females which are in line with previous studies [5, 8, 14, 15]. Private practitioners were in majority (72 %) which is coherent with other studies [8, 9, 14]. Eighty-one percent of the study participants had less than twenty years of experience like earlier studies [8, 9, 15, 16]. Less than half of the gynaecologists responded that pregnant patients reported with dental complaints, which is less compared to study done by Tarannum *et al* [17] and Nutalapati *et al* [18]. This might reflect awareness about oral health problems, access to dental care or value placed on oral health during pregnancy.

Eighty-eight percent of study participants said that oral health care is a part of prenatal care which is in accordance with previous studies [19, 20] and in contrary to study done by Al-

Habashneh *et al* [16] wherein the respondents believed oral health care is only indicated in the presence of patient's complaint. Hormonal effect and immunity changes in pregnancy have been associated with increased susceptibilities to gingivitis and gingival bleeding [5, 17, 21]. Increased tooth mobility has been associated with the microbial shift from aerobic to anaerobic bacteria [6, 21, 22]. Most respondents believed that pregnancy does not lead to tooth loss, which is contrary to Al-Habashneh *et al* study [16] which reflected popular belief "a tooth for a baby". An increase in dental caries has been associated with carbohydrate loading as snacking become more frequent which in some may be contributed by morning sickness and vomiting/reflux with promotes initiation and progression of dental caries [22]. Very few gynaecologists (34.0%) were aware of increased tendency of dental caries during pregnancy

which is line with other studies [5, 9, 14, 20, 23].

Epidemiological studies largely support an association between oral diseases and adverse pregnancy outcomes, though controversy still remains [6, 22]. In the present study, most of the respondents knew that periodontal diseases lead to preterm delivery while few agreed its effect on birth weight. This indicates that a considerable section of the gynaecologists did not relate oral health conditions to adverse pregnancy outcomes. While studies by Patil *et al*, India [19] Mariano da Rocha *et al*, Brazil [14] Hashim *et al*, UAE [15] Tarannum *et al*, India [17] Suri *et al*, India [5] have reported combined impact (preterm and low birth weight) of periodontal disease on pregnancy outcomes with majority of their study population being aware of this relationship.

The AAPD recommends that all pregnant patients should seek professional oral health care during the first trimester [22]. Pregnant woman is generally more comfortable during 14 to 20 weeks of gestation. Emergency dental care can be provided in any trimester but in third- trimester patient positioning modifications are needed because the pregnant uterus is below the umbilicus, in addition, dental appointments should be short in duration [1, 19, 22]. Hence dental treatment should be provided during this period. In this study most of the gynaecologists opined that dental treatment could be provided during pregnancy in the second trimester safely (60.7%). These findings corroborate previous studies [15, 17].

Dental infections or other complications occurring in the third trimester might be reduced by restorative or periodontal therapies during the second trimester. Dental rehabilitation and antimicrobial treatment will decrease vertical transmission of *Streptococcus mutans* from mother to child [1, 22]. Oral prophylaxis was most preferred dental treatment during pregnancy in this study followed by the restorative care which is line with other few studies [15, 16].

Local anesthesia does not pose fetal or maternal risk as compared to not providing care and can be used any time during pregnancy [22]. Due to increased risk of pregnancy loss, nitrous oxide is contraindicated in the first trimester. More than two-third agreed that local anesthesia can be used during pregnancy similar to Neeraj *et al* study while only 16.7 % considered general anaesthesia safe.

Dental caries and periodontitis are preventable through early and regular dental checkups, use of fluoridated toothpaste/mouth rinse containing and promoting health promoting diet [1, 8, 22]. When it came to applying their knowledge into practice 32% of study participants referred pregnant women for a dental check-up which is in considerably less when compared to other studies (51-100 %) [9, 14, 20, 18]. Very few (13.3%) performed an oral examination of their patients which corroborate with other studies [19, 20]. This might be due to lack of reinforcement, training, and busy schedule. About 40% advised their patient about use of other oral hygiene aids.

In agreement with the finding of previous studies [15, 16] the present study found no difference in mean knowledge score between age groups, gender, type of practice and years of practice. One study [9] reported the correlation between knowledge and less than 10 years' experience, those in private practice.

Similarly, no significant difference was found between practice score and Gynaecologists characteristics except for gender in advising for dental visits and dental floss practice in accordance with one study [8]. This should be interpreted with caution because there was the very small proportion of Gynaecologists performing oral examination (13.3%),

advising for dental visits (13.3%), use of dental floss (10 %) and mouth rinse (30 %). Hence further studies are suggested to validate these findings.

On the whole study participants exhibited fair knowledge regarding familiarity with various pregnancy related oral health topics, which is accordance with previous studies [5, 14-17, 20, 23]. Whereas practice related to advising dental visits or oral hygiene measures or performing an oral examination during pregnancy were found to be inadequate.

Being a state capital of Karnataka, Bangalore has seen a lot of development in the field of medicine and dentistry. Corporate, private hospitals are abundant in the city and there is no dearth for state of art facilities. A high response rate (93.7%), and representative sample might be considered as strengths of this study while self-reporting nature and inherent flaws in questionnaire designs might limit generalization.

Oral health diseases are preventable. The results of present study illuminated the lack of interdisciplinary approach between medical and dental professionals in "periodontal medicine" era.

- There is need of standard guidelines/policy at the national as well as institution level to ensure that all pregnant women are routinely screened and referred to specialized dental professionals.
- Oral health screening should be part of routine procedures in the antenatal clinics. Awareness about oral health should be integrated among pregnant women by Gynaecologist in antenatal clinics, during a periodic recall.
- Updating health curricula and continuing educational courses should be organized for the medical practitioners by the dental researchers. Publishing articles or reports related to these issues in medical journals may also help to update their knowledge about oral health.

## 5. Conclusions

Although study participants had a fair knowledge about oral health but their preventive oral health practice is inadequate which showed no difference across age, gender, type and duration of practice. Hence, there is the need for a coordinated interdisciplinary effort for better oral health outcomes during pregnancy and prevention of adverse pregnancy outcomes.

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