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Knowledge, attitude, practice of dental surgeons regarding dental radiographs in pregnant women in the city of Karachi

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Abstract

Introduction: In this modern era there is an increased awareness of the oral health amongst pregnant women and knowledge of dental surgeons of taking radiographs during pregnancy is also an utmost important factor The key principles and safety of taking radiographs of the pregnant women should be known along with the most appropriate radiographic technique. **Material and Method:** A cross sectional study was conducted to evaluate the knowledge,attitude and practices of dental surgeons regarding radiographs in pregnant women. A cluster sampling technique was used and 264 dental surgeons from7 different dental institutions were selected. A self questionnaire was distributed to the dental surgeons that comprised of 23 closed-ended questions. The data was entered and analyzed for frequency and percentages by using SPSS version 23. **Results:** The results showed that 47.68% knows that we can take radiograph during pregnancy. While 83.33% shows their attitude that they allow to take radiograph. 37.68% dentists have performed radiographs in their daily practice, in which 52.7% give the opinion that 2nd trimester is the safest period. **Conclusion:** All the members of the dental professionals must be aware of patient perceptions, preferences and patients needs. Dental studies should include guidelines and techniques to train the upcoming dentists for excellence practice in radiography of pregnant women so that upcoming mishaps can be avoided.

Keywords: knowledge, attitude and practices, radiograph, pregnant women.

INTRODUCTION

In this modern era there is an increased awareness of the oral health amongst pregnant women and knowledge of dental surgeons of taking radiographs during pregnancy is also an utmost important factor [1] The key principles and safety of taking radiographs of the pregnant women should be known along with the most appropriate radiographic technique. Theseionizing radiations emitting from these radiographs have biological damaging effects on the cell directly or indirectly and produces free radicals that causesdamage to DNA [2]. International Commission on Radiological Protection (ICRP) in 1977 proposed that pregnant women should undergo exposures of low doses and are accounted for their exposures [3]. Therefore an ALARA principle "As Low as Reasonably Achievable" was made compulsory during routinedental procedures [4]. Even though dental surgeons do not completely implement ALARA principles in their routine dental procedures [5, 6]. Scaling of teeth and dental radiographs are safe for pregnant women, according to new recommendations issued by The American College of Obstetricians and Gynecologists. Obstetricians and Gynecologists are now being advised to perform routine oral health assessments at the first prenatal visit and encourage their patients to see a dentist during pregnancy [7]. Pregnant women often takes appointment when there is severepain and infection associated andthat requires dental treatment along with the radiograph of the involved tooth. It is repeatedly reported that dental surgeons postpone dental treatments to the period after delivery because they lack the sufficient knowledge of the low doses involved in dental radiography [8]. During the first two weeks of pregnancy which is a period when the mother is unaware of her pregnancy these radiations may lead to miscarriage of the fetus. Therefore congenital abnormalities during the first two weeks of pregnancy and spontaneous abortion subsequent to radiation during the first two weeks of pregnancy at doses less than 25rads (250 mGy) is questionable [9]. Kusama *et al.,* [10] reported that the fetus does not directly receive radiation doses during head and chest radiograph and that the absorbed dose was estimated at less than 0.01 mGy.

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Therefore radiographs should not be done on any pregnant women unless there is an emergency. All radiographic techniques which lessen the absorbed dose should be undertaken when such radiographs are necessary and should be provided with well-collimated beams in precisely-protected shields. A high kVp technique is appropriate in such cases [9]. The teratogenicity of the radiation depends upon the foetal age and the dose of the radiation and therefore there is a potential risk to the foetusduring the first 10 days after the conception. The most critical period of the foetal development is between 4-18 weeks after the conception. The National Commission for Radiation Protective (NCRP) recommended the cumulative foetal exposure to radiation should not exceed more than 0.20 Gy [11].

Therefore, the objective of the study was to evaluate the knowledge, attitude and practices of dental surgeons regarding radiographs in pregnant women in the city of Karachi.

MATERIALS AND METHODS

A cross sectional study was conducted fromApril 2016 to march 2017 to evaluate the Knowledge, attitude and practices of dental surgeons regarding dental radiographs in pregnant women in the city of Karachi. The study was approved by ethical committee,Baqai Medical University. A cluster sampling technique was used and 264 dental surgeons from 7 different dental institutes were selected. The sample size was calculated by taking 78% of the prevalence rate and computed using the open epi version 3.01 at 95% confidence interval and α =5%.Dental graduates with a clinical experience of 1 year or more than 1 year andcurrently working in the dental institutions of Karachi.Graduates with no clinical experience or undergraduates were excluded from the study.A pilot study was carried out to validate the content of the questionnaire. The questionnaire consisted of 23 closed ended questions about the Knowledge, Attitude and practices of dental surgeons regarding dental radiographs in pregnant women and the response was recorded with yes/no/ don't know. The questionnaire was divided into three sections. First section contained 9 questions regarding knowledge of taking radiographs in pregnant women. Second section contained three questions regarding attitude of dental surgeons in taking radiographs in pregnant women. Third section contained 10 questions regarding practices of dental surgeons in taking radiographs in pregnant women. Two calibrated researchers distributed the pre tested questionnaires amongst the dental surgeons in various Dental teaching institutions and then were collected the next day.P-value > 0.05.

Data was entered and analyzed for frequencyand percentages by using IBM statistical package for the social sciences (SPSS) version22**.**

RESULTS

The present study comprised of 264 dental practitioners of experience less than 1 year and above. 169(64%) of the dental surgeons were aware of the harmful effects of radiographs. Table 1 showed knowledge of dental practitioners towards radiograph in pregnant women. 248(93.9%) of the dental surgeons were aware of the radiographic recommendations in pregnant women. Table 2 presents the attitude of the dental surgeons towards taking radiographs in pregnant women. Seventy five (28.4%) of the dental surgeons performed radiographs in any trimester. Thirty seven (14%) of the dental surgeons take a diagnostic radiograph in first trimester. One hundred and thirty nine (52.7%) of the dental surgeons were aware that 2nd trimester is the best period to take a diagnostic radiograph whereas 46(17.4%) of the dental surgeons take a diagnostic radiograph in 3rd trimester.Table 3 showed practices of dental surgeons towards taking radiographs in pregnant women.

Twenty (16.7%) of the dental surgeons who had been working for less than 1 year take radiograph during first trimester. Seventeen (11.8%)%) of the dental surgeons who had been working for more than 1 year take radiograph during first trimester. Graph 1showed practices of dental surgeons in taking radiographs in 1st trimester and its association with work experience.Sixty two (51.7%) %) of the dental surgeons who had been working for less than 1 year take radiograph during second trimester. Seventy seven (53.5%) of the dental surgeons who had been working for more than 1 year take radiograph during second trimester. Graph 2 showed practices of dental surgeons in taking radiographs in second trimester and its association with work experience. Twenty five (20.8%)of the dental surgeons who had been working for less than 1 year take radiograph during third trimester. Twenty one (14.6%) of the dental surgeons who had been working for more than 1 year take radiograph during third trimester. Graph 3showed practices of dental surgeons in taking radiographs in third trimester and its association with work experience.

Table 1: Knowledge of a dental surgeons towards radiographs in pregnant women.

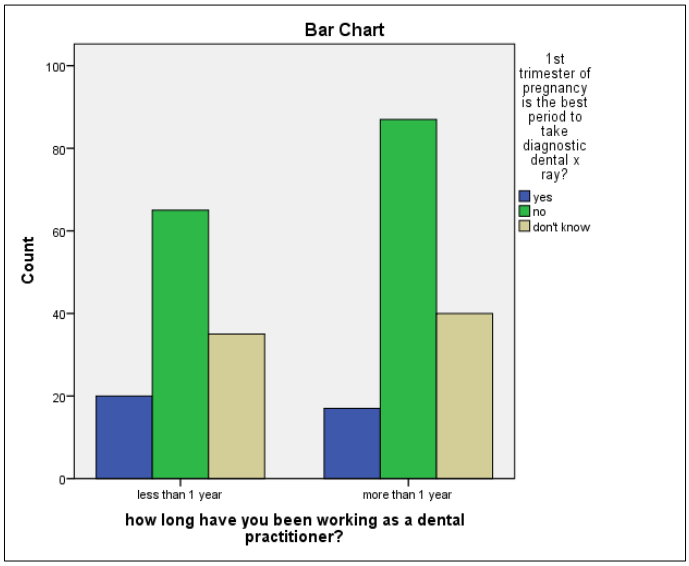
DETERMINANTS	YES	NO	DON'T KNOW
Dental radiographs are harmful?	169 (64%)	92 (34.8%)	3 (1.1%)
Do you know the precautions of dental x-ray in pregnant women?if needed	243 (92%)	16 (6.1%)	5 (1.9%)
Are dental radiographs useful to take in pregnant women?	145 (54.9%)	106 (40.2%)	5 (4.9%)
Do you know about the ALARA (As Low as reasonably achievable)Principle?	109 (41.3%)	124 (47%)	31 (11.7%)
High speed films reduce exposure?	82 (31.1%)	75 (28.4%)	107 (40.5%)
Do you believe/know the teratogenic risk of radiation from the x ray is 1000 times less than the natural risk of spontaneous abortion/malformation?	107 (40.5%)	65 (24.6%)	92 (34.8%)
Dental x-ray are absolutely contra-indicated for pregnant patients?	63 (23.9%)	190 (72%)	11 (4.2%)
Are effects of dental radiograph reversible on fetus?	51 (19.3%)	168 (63.6%)	45 (17%)
Does the position of the x-ray radiation cone can effect the featus?	164 (62.1%)	52 (19.7%)	48 (18.2%)

Table 2: Attitudes of dental surgeons in towards radiographs in pregnant women

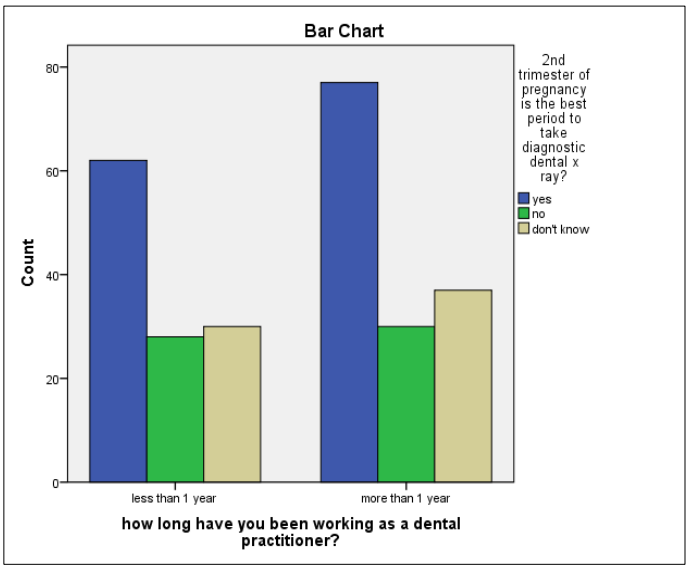
DETERMINANTS	YES	NO	DON'T KNOW
Are you aware of radiation hazard symbol?	169(64%)	92(34.8%)	3 (1.1%)
Are you aware of radiographic recommendations in pregnant women?	248 (93.9%)	12 (4.5%)	4 (1.5%)
Would you take a consent from a pregnant patients before taking radiographs?	243 (92%)	19 (7.2%)	2 (.8%)

Table 3: Practices of a dental surgeons towards radiographs in pregnant women

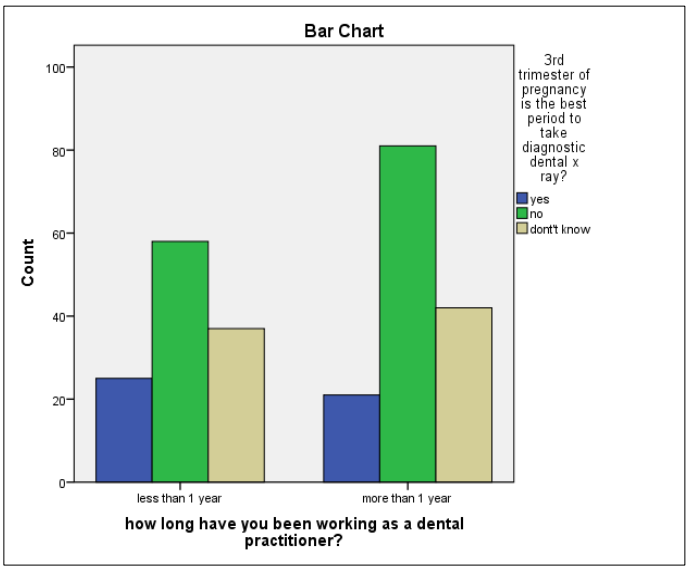
DETERMINANTS	YES	NO	DON'T KNOW
Do you perform dental radiographs in any trimester?	75 (28.4%)	183 (69.3%)	6 (2.3%)
1st trimester of pregnancy is the best period to take a diagnostic dental x-ray?	37 (14%)	152 (57.6%)	75 (28.4%)
2ND trimester of pregnancy is the best period to take a diagnostic dental x-ray?	139 (52.7%)	58 (22%)	67 (25.4%)
3RD trimester of pregnancy is the best period to take a diagnostic dental x-ray?	46 (17.4%)	139 (52.7%)	79 (29.9%)
Do you perform dental radiograph in dental emergency/emergencies in pregnant women?	134 (50.8%)	113 (42.8%)	17 (6.4%)
Would you prescribe periapical x-ray to the patient? if needed	182 (68.9%)	78 (29.5%)	4 (1.5%)
Would you prescribe orthopantogram (OPG) x-ray to the patient? if needed	92(34.8%)	159 (60.2%)	13 (4.9%)
Would you prescribe cone beam computed tomography (CBCT) x-ray to the patient ? if needed	50 (18.9%)	169 (64%)	45 (17.0%)
Would you prescribe CT scan to the patient ? if needed	57 (21.6%)	175 (66.3%)	32 (12.1%)
Would you take a radiograph of a tooth of pregnant patient with maximum radiation protection and precautions?	183 (69.3%)	68 (25.8%)	13 (4.9%)



Graph 1: Practices of dental surgeons in taking radiographs in 1st trimester and its association with work experience.



Graph 2: Practices of dental surgeons in taking radiographs in 2nd trimester and its association with work experience.



Graph 3: Practices of dental surgeons in taking radiographs in 3rd trimester and its association with work experience.

DISCUSSION

The present study was done to assess the Knowledge, Attitude and Practices of dental surgeons towards radiographs in pregnant women. The electromagnetic radiations that are released in the form of X-rays have the ability to ionize the materials through which it passes. Depending on the amount of radiation and the trimester of pregnancy, fetal cells get damaged and may result in miscarriage, birth defect or mental impairment.However the dental radiations exposure of the fetus is negligible [12]. The present study results reported that 169(64%)

of the dental surgeons had the knowledge that radiographs are harmful for pregnant women. Monica P *et al* [13] in a study reported that 240(96%) of the dental surgeons had the knowledge that radiographs are harmful for pregnant women.

Several precautions can be taken to avoid the foetal exposure when radiographs need to be taken. Using a lead shield over the patient's abdomen, using a properly collimated beam, and using a high-speed film, can reduce the foetal exposure [9]. The present study reported that 243(92%) of the dental surgeons knew the precautionary measures to be taken for radiographs in pregnant women. Monica P *et al* [13] in a study reported that 176(70.4%) of the dental surgeons strongly agreed that that radiographs in the pregnant women should only be taken with proper protection techniques.Razi *et al* [8] in a study reported that a total of 92% of the dental surgeons were aware of the necessity of the use of lead aprons during radiography.

The amount of radiation used to obtain bitewing radiographs is0.005 millisieverts (mSv) of radiation (a millisievert is a unit of measure. Dentists follow the ALARA principle which stands for "As Low As Reasonably Achievable," when taking radiographs. This radiation safety principle limits the exposure by incorporating the techniques [14]. The present study reported that 109(41.3%) of the dental surgeons follow the ALARA principle. Monica P *et al* 13 in a study reported that 132(52.8%) of the dental surgeons follow the ALARA principle.

According to the American College of Radiology, no single diagnostic x-ray has a radiation dose significant enough to cause adverse effects in a developing embryo or fetus [15]. According to the ADA and ACOG, having dental X-rays during your pregnancy is considered safe with appropriate shielding [16].

The present study reported that 107(40.5%) of the dental surgeons knew the teratogenic risk of radiations from the X-rays that terminates the pregnancy. Razi *et al* [8] in a study reported that 145 (58%) of the dental surgeons were aware of the radiation doses for pregnancy termination. Monica P *et al* [13] in a study reported that 42(16.8%) of the dental surgeons were aware of the radiation doses for pregnancy termination.

The use of dental radiograph during pregnancy has been a contentious issue. The teratogenic risk of radiation exposure from intra-oral films is 1000 times less than the natural risk of spontaneous abortion or malformation [17]. Dental radiography can be performed during pregnancy for emergency purposes [18]. Where possible; radiographs should be delayed until the second trimester. Radiographs taken for regular check-ups are best taken after delivery [19]. The present study reported that 75(28.4%) of the dental surgeons were in a practice

of performing radiographs in any trimester. Thirty seven (14%) of the dental surgeons were in a practice to take diagnostic radiograph in first trimester. One hundred and thirty nine (52.7%) of the dental surgeons were in a practice to take diagnostic radiograph in second trimester. Forty six (17.4%) of the dental surgeons were in a practice to take diagnostic radiograph in third trimester.Braimoh O *et al* [19] reported that 48(64.9%) of the dental surgeons knew that dental radiograph could be taken at any trimester in pregnancy and 44 (60%) of dental surgeons knew the best time to take dental radiograph was the second trimester of pregnancy. Zanata *et al* [20] reported that 16.2% and 37.8%, of the dental surgeons knew that dental radiograph was safe throughout in pregnancy and is best taken in second trimester.

Aljulayfi I *et al* [21] in a study reported It clearly shows that most of them consider the use of X ray when it is indicated, furthermore 82% of dental surgeons were of the opinion that the second trimester is the most suitable period to treat pregnant women especially with dental pain. A similar study, held in Connecticut to evaluate general dentists found that most dentists (77%) would take a radiograph of a patient 10 weeks into the pregnancy (second trimester) seeking treatment for dental pain [22].

A study conducted by Pegah *et al* [23] 66% of dentists were aware about the radiography instructions for pregnant women or instructions on how to take radiography in pregnant women. Zanata *et al* [20] reported that 38.7% of dental surgeons indicated that all types of radiography should be taken after the first trimester and only 25.5% of dental surgeons correctly knew that radiography is better to be postponed until the second trimester of pregnancy and that only 16.2% of dental surgeons allowed women for dental radiography throughout their pregnancy.About 89.1% of dental surgeons acknowledged the feasibility of three types of radiography on the condition that the safety rules are observed.

CONCLUSION

Dental practitioners must be aware of radiographic recommendations of pregnant women in order to prevent the upcoming life threatening events. The fetus is most sensitive to radiation effects between 8 and 15 weeks of pregnancy. Dental studies should include guidelines and techniques to train the upcoming dentists for excellence practice in radiography.

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