

Knowledge of General Dentists in Provision of Endodontic Treatment to Pregnant Women in Chitwan

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ABSTRACT

Introduction: Pregnant women have relatively higher rates of untreated dental caries and visit dental clinics with excruciating pain. They should be treated with special considerations. Endodontic treatment enables to control spread of odontogenic infection, maintain healthy oral environment, minimise possible complications in later pregnancy.

Objective: To assess the perception of dentists about performing endodontic treatment to pregnant women.

Materials and Method: A descriptive cross-sectional study of 70 general dental practitioners engaged in different government hospitals, private clinics, and teaching hospitals in Chitwan was conducted using convenience sampling from May to December 2020 after ethical approval from College of Medical Science. A questionnaire consisting of 18 questions was used to collect data. Data were analysed for simple descriptive analysis using SPSS v.25: frequency and percentage distribution were calculated.

Result: Importance to provide appropriate endodontic treatment during pregnancy was acknowledged by 69 (98.57%) of the general practitioners. These general practitioners also considered second trimester as the safest trimester to render endodontic treatment. Majority of the respondents considered local anaesthesia 55 (78.57%) and interappointment intracanal medicaments 60 (85.71%) to be safe during pregnancy while radiographs and intracanal irrigants were considered safe only by few participants.

Conclusion: Findings of this study reveal that general dental practitioners realise the safety of endodontic treatment to pregnant women. However, they have insufficient knowledge with regards to the safety of irrigants and radiographic exposure for pregnant women. Therefore, continuing education courses can be advantageous to general dentists to bolster their knowledge for better endodontic treatment of pregnant women.

Keywords: Endodontic treatment; general dental practitioners; intracanal irrigants; intracanal medicament; pregnancy; radiograph.

INTRODUCTION

Pregnancy is a wonderful major milestone in a woman's life. Every woman has the right to enjoy pregnancy free of any discomfort, at least without excruciating dental pain. However, during this period, ongoing physiological changes demand

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special consideration and modification in dental treatment. Several studies have indicated that pregnant women have relatively higher rates of untreated dental caries.^{1,2} Moreover, pregnancy is not a reason to defer endodontic treatment, but its management may require special considerations that may include certain adjustments to the timings during treatments and drugs to be prescribed.³

One of the possible treatment options in endodontic disease is to control the spread of odontogenic infection, maintain a healthy oral environment, and minimise the expected complications that can occur later in pregnancy or during the postpartum period, involves root canal treatment (RCT).¹ Endodontic treatment may necessitate the use of radiographs, various local anaesthetic agents, root canal irrigants, intracanal medications, and drugs comprising of analgesics and antibiotics.³

General dentists are usually unsure regarding providing endodontic treatment to pregnant patients bearing in mind the safety of endodontic treatment during pregnancy.⁴ This study aims to assess the knowledge of general dentists with regard to providing endodontic treatment during pregnancy.

MATERIALS AND METHOD

A descriptive cross-sectional study was carried out among 70 general dental practitioners practicing in government hospitals, private clinics, and teaching hospitals in Chitwan, Nepal. The study was conducted for a period of eight months from May 2020 to December 2020. The research proposal and survey questionnaire were approved by the ethical

committee of the College of Medical Sciences Teaching Hospital (Ref. 2020-106). A convenience sampling method was used for the selection of participants.

A self-administered pretested questionnaire was developed that comprised of 18 questions based on existing literature. The questionnaire also included information of principle author, consent, and confidentiality of the participants. The validity of the questionnaire was assessed by conduction of a pilot study on 15 general dental practitioners practicing out of the Chitwan district. Cronbach's alpha test was carried out and the value was 0.81. The sample size was calculated using formula: $sample\ size = \frac{Z^2 pq / e^2}{1 + (Z^2 pq / e^2 N)}$; where, $Z=1.96$ for 95% confidence interval; $p=50$; $q=100-p=50$, $e=5\%$; N =total number of general dentists in Chitwan=85. The sample size was calculated to be 70.

Electronic version of the questionnaire was mailed to the participants. The participants were contacted by telephone or in-person and were asked to complete the online survey. The data were entered into Microsoft Excel spreadsheet. Statistical analysis software, IBM SPSS Statistics for Windows, version 25 (IBM Corp., Armonk, N.Y., USA) was used for simple descriptive analysis of collected data: frequency and percentage distribution was calculated.

RESULT

Data were collected from 70 participants. The demographic data are detailed in Table 1.

Table 1: Demographic characteristics of respondents, n (%).

Variable		Frequency (percentage)
Gender	Male	28 (40)
	Female	42 (60)
Years of experience	0 - 5	64 (91.42)
	6 - 10	3 (4.28)
	10 - 20	3 (4.28)
Place of practice	Private hospital	24 (34.28)
	Private clinic	38 (54.28)
	Government hospital	5 (7.14)
	Teaching hospital	2 (2.85)
	Private hospital and private clinic	1 (1.42)

Table 2: Preference and use of local anaesthesia, n (%).

Local anaesthetic agent	Frequency (percentage)
Lidocaine hydrochloride with adrenaline of 1:100,000	43 (61.42)
Bupivacaine	14 (20)
Mepivacaine	8 (11.42)
Prilocaine	3 (4.28)
Lidocaine hydrochloride with adrenaline of 1:100,000, prilocaine	1 (1.42)
Bupivacaine, lidocaine hydrochloride with adrenaline of 1:100,000	1 (1.42)

The importance to provide appropriate endodontic treatment to alleviate dental pain and infection during pregnancy was acknowledged by 69 (98.57%) of the general practitioners. Root canal treatment was considered a safe procedure during pregnancy by 50 (71.42%) of the participants while 6 (8.57%) considered it unsafe and 14 (20%) were uncertain. Furthermore, 69 (98.57%) of the participants considered the second trimester a safe period to carry out endodontic treatment while 1 (1.42%) considered the first trimester to be safe for endodontic treatment.

Knowledge regarding positioning of a pregnant patient in a special way during endodontic treatment was observed in 68 (97.14%) of the respondents while 2 (2.85%) were uncertain. Of the total respondents 51 (72.85%) advocated a lateral position on a dental chair, 16 (22.85%) preferred higher head than feet position, and 3 (4.28%) preferred the usual chair position like other patients for pregnant patients as well.

Use of local anaesthesia, before initiating an endodontic treatment of a pregnant patient, was preferred by 55 (78.57%) of the participants and was not preferred by 15 (21.42%) of the participants. Similarly, the use of local anaesthesia with epinephrine on a pregnant patient was considered

safe by 31 (44.28%) of the participants, considered unsafe by 16 (22.85%) of the participants, and 23 (32.85%) of the participants were uncertain. Table 2 presents the various local anaesthetics chosen by respondents during an endodontic treatment of pregnant patients.

Concerning the use of root canal irrigants and possible danger it could pose to a foetus, 32 (45.71%) of the respondents thought the use of root canal irrigants was not safe, 26 (37.14%) of the respondents were not certain and 12 (17.14%) of the respondents thought the use of irrigants posed no danger to a foetus. Moreover, it was observed that during root canal treatment of pregnant patients, normal saline was frequently used root canal irrigants among general dentists 36 (51.42%). Table 3 presents the various intracanal irrigants preferred during treatment of pregnant patients.

Interappointment intracanal medicaments for pregnant patients was preferred by 60 (85.71%) of the participants and calcium hydroxide was commonly used intracanal medicament among 55 (78.57%) of the participants. A double antibiotic paste was desired by 2 (2.85%) of the participants. Calcium hydroxide and double antibiotic paste were preferred by 3 (4.28%) of the participants.

Table 3: Preference for intracanal irrigants, (n, %).

Types of irrigants	Frequency (percentage)
Saline	36 (51.42)
Chlorhexidine gluconate	4 (5.71)
Sodium hypochlorite	14 (20)
Combination of saline, sodium hypochlorite, and chlorhexidine gluconate	6 (8.57)
Combination of saline and chlorhexidine gluconate	6 (8.57)
Combination of saline and sodium hypochlorite	4 (5.71)

Table 4: Preference and use of dental x-ray, n (%).

Type of x-ray	Prefer use of dental x-ray	
	Yes (32.85)	No (67.14)
Radiovisiography (RVG)	17 (73.91)	33 (70.21)
Conventional intraoral periapical (IOPA)	2 (8.69)	10 (21.27)
Orthopantomogram (OPG)	1 (4.34)	-
cone beam computed tomography (CBCT)	1 (4.34)	4 (8.51)
OPG, RVG	2 (8.69)	-
Total	23 (100)	47 (100)

It was observed that the majority of the participants 60 (85.71%) choose to consult the patient's gynaecologist as a prerequisite to treating the patient.

It was normal for 23 (32.85%) of the respondents to expose pregnant patients to dental x-rays for a root canal treatment whereas 47 (67.14%) did not prefer the use of dental x-ray. Irrespective of dental practitioners preference when the treatment mandated x-ray, RVG was the choice of x-ray for most of the practitioners (73.91%). Table 4 below shows the preference regarding the use of dental x-ray and the type used.

DISCUSSION

Many pregnant women visit dental clinic with excruciating dental pain. Endodontic treatment can be considered as an emergency treatment that should be provided to pregnant patients to relieve dental pain and infection. The treatment can be beneficial to mother and foetal health. Nonetheless, general dentists are often not quite confident in treating pregnant patients.⁴ However, on the contrary to this fact, majority of the general dentists in this study felt imperative to provide appropriate endodontic treatment to alleviate dental pain and infection during pregnancy and considers root canal treatment as a safe treatment of choice to relieve pain and infection. While few of them were not knowledgeable regarding providing treatment to pregnant patients, based on the observation that 6% of the participants considered it as unsafe and 20% were uncertain.

Endodontic treatment for pregnant patients is aimed to control the disease, maintain a healthy

oral environment and avoid possible complication that could occur in the later phase of pregnancy or during the postpartum period. First trimester is the most crucial period for the growth of a foetus, hence any treatment that can be avoided in this phase should be postponed to the next trimester to avoid any threat of troublesome effect of endodontic treatment. If a pregnant woman complains of dental pain in this phase, the dentist can perform treatment such as an emergency access opening, extirpation of the inflamed pulp, pus drainage, relieve the pain, and can place intracanal medicaments in an interappointment dressing. Among the three trimesters, the second trimester is considered the safest trimester to treat pregnant patients. Complete endodontic management can be performed in this phase. If pregnant patient experiences dental pain in the third trimester, only an emergency treatment can be provided.⁵ Definitive treatment and extensive elective endodontic procedures can be deferred until after delivery, if possible. Findings of this study suggest that majority of general dentists are quite knowledgeable regarding the timing of endodontic treatment for pregnant patients.

The majority of study participants (68, 97.14%) were mindful that a pregnant patient should be positioned in a special way with a larger number of participants owing the proper idea of the best position. In the third trimester when a pregnant patient lies flat on her back on a dental chair, risk of supine hypotension syndrome is higher due to the pressing of the uterus on the inferior vena cava that impedes the venous return to the heart. This problem can be prevented during endodontic treatment by positioning the pregnant patient in a left lateral decubitus position with the right buttock

and hip elevated by 15° or semi-reclining position on a dental chair that encourages frequent change in position and/or by placing a wedge underneath one of her hips to displace the uterus.⁶

Local anaesthetics are usually employed before an endodontic procedure. Local anaesthesia with vasoconstrictor can be safely administered to a pregnant patient during an endodontic treatment; provided that aspiration is always done to avoid intravascular injection.⁷ The application of local anaesthetics eliminates any source of pain and thus may help to avoid prolonged use of systemic analgesics and antibiotics.⁸

General dental practitioners in this study are seen well informed on this, 55 (78.57%) of respondents prefer local anaesthetic before endodontic therapy during pregnancy. Local anaesthetics like lidocaine, lidocaine with adrenaline are safer during pregnancy. Moreover, prilocaine and etidocaine are safer to use in pregnancy. But, prilocaine due to smaller molecular size crosses the placenta quicker than lidocaine and bupivacaine.⁷ Prilocaine in excessive dose can cause methemoglobinemia. A large dose of prilocaine and articaine is seen to cause respiratory distress, ultimately resulting in death. However, bupivacaine is contraindicated during pregnancy as it increases foetal bradycardia. Also, bupivacaine and mepivacaine are associated with embryocide in rabbits when using the maximum daily dose.^{9,10}

For the success of an endodontic treatment; the use of appropriate root canal irrigants is imperative. Use of root canal irrigants like sodium hypochlorite, chlorhexidine gluconate and saline with appropriate isolation system is completely safe during pregnancy. Moreover, sodium hypochlorite is considered as primary root canal irrigant,¹¹ exhibiting properties like broad antimicrobial action and unique ability to dissolve organic matter.¹²⁻¹⁴ For optimal irrigation, the combination of two or more irrigating solutions in a specific sequence is to be employed. Result of current study shows very few general dentists understand root canal irrigant during pregnancy is safe and more than 50% (36, 51.42%) of them just use normal saline as root canal irrigant during pregnancy. Hypochlorite and

combination of sodium hypochlorite, saline, and 2% chlorhexidine gluconate are used by a small number of dentists.

A radiograph is an important tool in the diagnosis and treatment during endodontic therapy and is considered safe during pregnancy. Contemporary dental radiographs like digital radiographs offer the advantage of the reduction in radiation, hence a patient's exposure to x-ray is less and it does not cause any foetal malformation. High radiation exposure leads to damage to the central nervous system of foetus/newborn.¹⁵ The study reports that 47 (67.14%) of general dentists were apprehensive to expose dental x-ray to pregnant patients during root canal treatment procedure. Irrespective of dental practitioners' preference, when the treatment mandated x-ray, RVG was the choice of x-ray for most of the practitioners (17, 73.91%). Few general dentists were also seen preferring OPG and CBCT for pregnant patients during endodontic treatment. There is no evidence linking foetal complication to x-ray even for panoramic radiographs when used with appropriate precaution.¹⁶ The dental x-rays are meticulously directed toward mouth rather than to abdomen.^{17,18} Furthermore, with the prospect of the current scenario of this pandemic, extraoral radiographs like OPG are taken with utmost precaution and can be way beneficial than intraoral radiographs in avoiding exposure to coronavirus in pregnant patients.

Interappointment intracanal medicaments were preferred by 60 (85.71%) of the participants for pregnant patients and calcium hydroxide was commonly used intracanal medicament among 55 (78.57%) participants. Role of intracanal medicaments to eliminate microbial population during endodontic treatment cannot be denied. Intracanal medicaments such as calcium hydroxide, chlorhexidine and double antibiotic paste can be safely used during pregnancy. Calcium hydroxide is considered as the gold standard intracanal medicament for interappointment dressing.¹⁹ Majority of the dentists have been observed to use calcium hydroxide as intracanal medicament during pregnancy.

In the study, 60 (85.71%) of the general dentists would consider a consultation with the patient's gynaecologist as a mandatory requirement before treating the pregnant patient. Gynaecologists play an important role in the recommendation of a safe dental treatment as well as can address health issues related to the patient.

CONCLUSION

The findings of this study reveal that general dental practitioners realise the safety of endodontic treatment to pregnant women. However, they have insufficient knowledge with regards to the

safety of the use of irrigants, its appropriate type and sequence to be employed during intracanal irrigation. The outcome of the study also uncovers inadequate knowledge with regards to radiographic exposure for pregnant women. Therefore, continuing education course can be advantageous to general dentists to bolster their knowledge for better endodontic treatment of pregnant women.

Conflict of Interest: None.



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