SUNTEXT REVIEWS

SunText Review of Dental Sciences
ISSN: 2766-4996

Open Access
Research Article
Volume 2:1

Management of Pregnant Patients in Dentistry- Investigation of the Knowledge of Undergraduate Students

Ahmed S[1,*], Alshammari AH[2], AlTakroni GS[3], Hawsawy BA[2], ALOnazi A[2], Alqahtani A[2], AlAyahya T[2] and Tabassum N[2]

[1]*Riyadh Elm University, Riyadh city, KSA, Saudi Arabia*
[2]*Dental surgeon, Riyadh, KSA, Saudi Arabia*
[3]*Prince Sultan Medical Military City, KSA, Saudi Arabia*

[*]**Corresponding author:** Ahmed S, Riyadh elm university, Riyadh city, KSA, Saudi Arabia; E-mail: drsuhael@riyadh.edu.sa

Received date: 29 December 2020; **Accepted date:** 06 January 2021; **Published date:** 10 January 2021

Citation: Ahmed S, Alshammari AH, AlTakroni GS, Hawsawy BA, ALOnazi A, Alqahtani A, et al. (2021). Management of Pregnant Patients in Dentistry- Investigation of the Knowledge of Undergraduate Students. SunText Rev Dental Sci 2(1): 129.

DOI: https://doi.org/10.51737/2766-4996.2021.029

Abstract

Aim: This study aims at evaluating knowledge and awareness of students in managing pregnant patients seeking dental treatment.
Material and Methods: After obtaining approval from the research committee, Riyadh Elm University, Riyadha cross sectional study was conducted in 400 female students from the college comprising of level 8 to 12.
Results: Since the study was based on female dental students' knowledge about dental considerations in pregnant patients, no cross tabulation was done between gender and knowledge of pregnant patient management.
Conclusion: Overall, the knowledge of students regarding management of a pregnant patient was limited.

Keywords: Trimester; Pregnancy; Dental treatment

Introduction

Pregnancy causes many changes in physiology of a woman. These changes may sometimes be subtle but may cause complications if precautions are not taken during dental treatment. Fetal growth and secretion of hormones during pregnancy can induce many local and systemic physiologic changes in pregnant women. Physical changes occur in various parts of the body, with changes noticed in oral tissues too. These changes can pose challenges in providing dental care for these patients. Effects of treatment of the pregnant patient can potentially affect the well-being of the fetus.

Due to uncertainty of the risks involved dentists are often reluctant to treat pregnant patients even though it is in the safe period. Emergency, preventive, and routine dental procedures can be performed during different phases of pregnancy, with necessary modifications and proper planning.

Material and Methods

After obtaining approval from the research committee, Riyadh Elm University, Riyadha cross sectional study was conducted in 400 female students from the college comprising of level 8 to 12. A closed format survey questionnaire was designed to assess knowledge of students in patient management in each trimester in dental treatment for pregnant patients. Statistical analysis was done using SPSS version 22.

Results

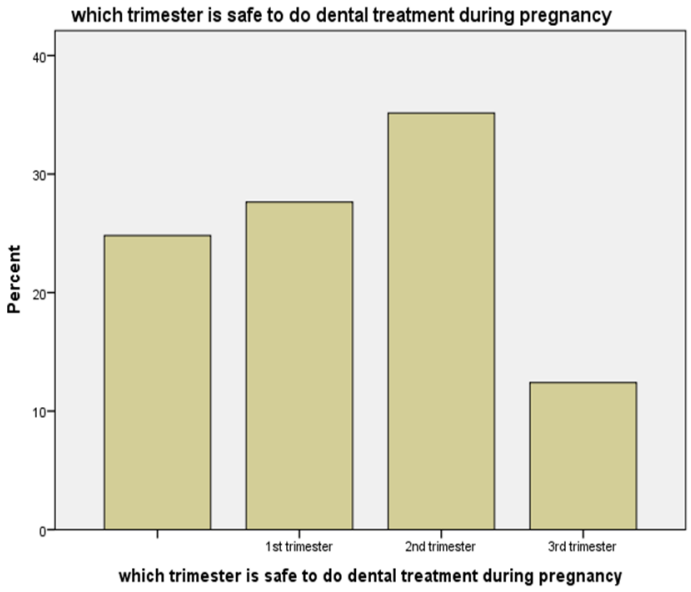
Since the study was based on female dental students' knowledge about dental considerations in pregnant patients, no cross tabulation was done between gender and knowledge of pregnant patient management.

Each student group was cross tabulated against each variable to determine if the level of education or clinical exposure is directly related to the knowledge of management of pregnant patients in dental clinics and eventual treatment outcome in pregnant

patients. A 35% of students believed that 2nd trimester is safe for dental treatment. Pearson's chi-square analysis showed p-value of 0.000, which is highly statistically significant. Assessment of knowledge about analgesic prescription in pregnant patients showed a p-value of 0.000, which is statistically significant (Table 1,2). A 89.1% of students believed oral radiation is safe during 3rd trimester. 74.9% of students believed oral radiation is safe during 2nd trimester.

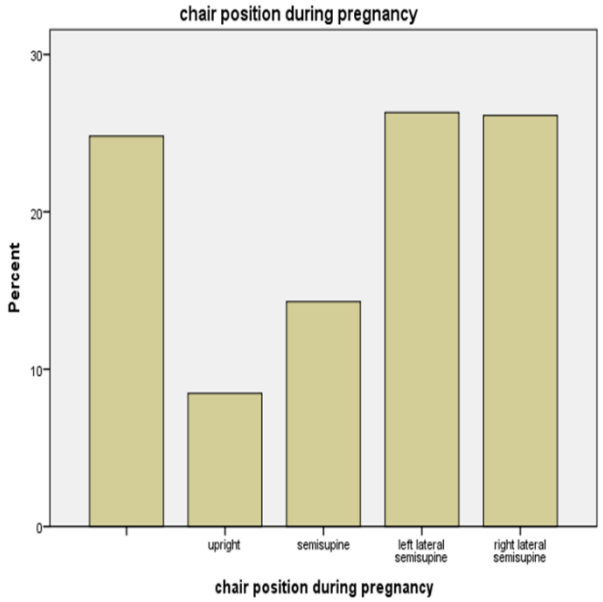
Discussion

Before scheduling pregnant patients for dental treatment, a thorough knowledge of the pros and cons of the treatment undertaken, and the drugs being prescribed is highly essential for the welfare of the pregnant mother and the fetus. Regarding knowledge of dental surgeons on taking radiographs of pregnant women, capucho et al. found that 40-50% have doubts about the use of X-rays. Al-Shadan and Al-Manee concluded that 43% would not take a radiograph under any circumstance.16% considered use of X-rays safe throughout pregnancy; 38%, only after 1st quarter 38% oppose radiography at any stage of pregnancy.



Graph 1: *Which trimester is safe to do dental treatment during pregnancy.*

To select the most suitable imaging modality, diagnostic value, and safety of radiography to mother and fetus should be known. There is evidence that ionizing radiation has damaging effects biologically which could affect cells directly or indirectly and produce free radicals which cause DNA damage [1,2]. Biological hazards can be divided into stochastic effect and Non-stochastic. Are stochastic or deterministic effects being those influences which increase the limit of dose cell injury. It begins to appear [3]. In random effect there is no specific dose that can trigger Biological and cell damage occur at any dose level. High dose of ionization. Radiation has inevitable and random effects, but low dose radiation. Mostly random effects [4]. ALARA principle of "reasonably least achievable". It was mandatory during the routine work of the dentist. But dentists do not always adhere to ALARA principles [5-8]. Therefore, stochastic effect can have more effect on dentists and patients as there is no threshold dose. Though X-rays are helpful for diagnosis, dentists should also be cautious of its biological hazards [9]. It is noted that when a radiograph is necessary dentists often defer treatments to the period post-delivery as they do not have sound knowledge of low doses involved in dental radiation [10]. Kusama et al, A radiation dose of less than 100 mG (10 radon) is reported to be safe for the fetus. Pregnancy termination is not required. He also revealed radiation doses during the head. Diagnostic chest exposures did not affect the fetus directly and the dose absorbed was less than 0.01 mGy [11]. Therefore, radiographs should be used only if necessary. Radiographs should be equipped with well-collimated beams in precisely protected shields. A high kVp technique is appropriate in such cases [12].



Graph 2: *Chair position during pregnancy.*

Regarding knowledge of dental surgeons on drug prescription and anesthetic administration,14% were against the use of anesthesia during pregnancy,7% had doubts about the use of medications 43% did not know the best anesthetic for pregnant women. As for use of analgesics, most students felt that acetaminophen was the safest drug and a close second number of students believed meperidine was a better choice of analgesic. Food and Drug Administration (FDA) has classified drugs into 5 categories of safety for use during pregnancy [1,8] Safest drug is

Acetaminophen and should be the first choice among NSAIDs. It is rated as an FDA category B drug for all three trimesters [1,4,6,9]. Ibuprofen in the first and second trimesters is a category B analgesic [4]. Penicillin's and cephalosporins which are beta-lactum ring derived antibiotics should be first choice for orofacial infections. These antibiotics have proved to be safe during pregnancy even though they cross placenta [9]. Drugs such as tetracycline, metronidazole, and erythromycin estolate must be avoided during all three trimesters [8].

Table 1: *level 8,9,10,11,12 or intern, which analgesics can be prescribed for pregnant patients? Crosstabulation.*

Count		Which analgesics can be prescribed for pregnant patients?				Total
		acetaminophen	meperidin	all the above	avoid all analgesics	
level 8,9,10,11,12or	dental interns	8	4	0	0	12
	level 8	70	61	1	0	132
	level9	68	79	0	0	147
	level10	28	22	0	0	50
	level 11	19	22	0	1	42
	level 12	8	8	0	0	16
	8	0	0	0	1	1
Total		201	196	1	2	400

Table 2: *Chi-Square Tests.*

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	209.478a	18	.000
Likelihood Ratio	21.625	18	.249
N of Valid Cases	400		

Metronidazole is currently recommended for use in the second and third trimesters only, even though it has not been associated with adverse fetal affects [10]. Estolate form of erythromycin must be avoided as it could have detrimental effect on mother's liver [4,8]. Tetracycline is grouped under category D as it chelates calcium orthophosphate causing a hypoplastic matrix, tooth discoloration and inhibition of bone development and may cause maternal hepatotoxicity [11]. It is safe to use epinephrine in permissible doses in local anesthesia during pregnancy [9,12] with precautions to avoid injecting into blood vessels with dosages at or below 0.04 mg of epinephrine.

Regarding knowledge of dental surgeons and odontology students regarding the best treatment period for pregnant women, 36% would postpone dental treatment for postpartum.10% would perform all the required treatment. However, our study involved the students and not professionals. We found that 38 percent students believed 2nd semester is the safest period for any kind of dental treatment. On being asked about the proper dental chair position for a pregnant patient not everyone was aware that left lateral position was the preferred one.

If dental caries or any other dental condition requires immediate attention and treatment due to acute pain in a healthy pregnant patient, prompt care needs to be provided irrespective of the trimester [19]. Allowing an active infection to progress without treatment can be riskier than hazards of providing care [1,20]. Sepsis and febrile illness have been known to cause miscarriage [20]. Unfortunately, only 37% of interns were aware that acute dentoalveolar infection should be treated promptly. Pregnancy gingivitis are more common during pregnancy [20,21]. Inflammatory response to oral bacteria is exacerbated by changes in progesterone and estrogen levels, diminished immune response and changes in oral flora [21,22]. Pregnancy tumor is seen in around 5 percent of pregnant women. Unless tumor bleeds or obstructs mastication excision is generally not recommended. Tumors have also known to recur after removal [21]. Incidence of tooth decay during pregnancy is high due to less consumption of carbohydrate rich meals, increased acid production in oral cavity from vomiting and minimal attention to oral health [23,24]. Gastric acid exposure due to morning sickness during early pregnancy and a lax esophageal sphincter in later stages of pregnancy could also be the reason for dental erosion [19]. Elective treatment in a healthy pregnant patient should not be delayed as it lacks medical justification. About 85% of abortions occur in the first trimester and in one out of every 5 pregnancies there is spontaneous abortion. Elective treatment may be postponed to the second trimester to avoid a correlation being made between dental treatment and spontaneous abortion [26]. In second trimester organogenesis is complete and hence risk to

fetus is minimal and is the safest time to provide dental care [23]. Although extensive elective procedures need to be avoided [27]. Eighty seven percent of interns were aware that second trimester is the most appropriate time to provide routine dental care [28]. In third trimester due to increase in size of uterus the pregnant patient may experience discomfort however there is no risk for fetus [29,30]. If treatment is done, chair position of patient needs special attention. Pregnant patient needs to be in left lateral position and not semi supine or supine position as there are chance of supine hypotensive syndrome and risk of deep vein thrombosis [31]. IN case of supine hypotensive syndrome, patient needs to be immediately turned to her left to allow return of circulation to heart by moving the uterus off the vena cava [32]. Shor schedules are recommended, and frequent change of sitting position is advised [26]. To treat anxiety nonpharmacological methods should be considered to avoid risk of exposure of fetus to drugs [6]. Dental radiography is a controversial subject in management of the pregnant patient. Safety of dental radiography has been well established, providing features such as quick exposure techniques (e.g. high speed film, digital imaging) filtration, collimation and lead aprons are used [33,34]. Only 11% of the interns were aware that dental radiograph is safe in pregnant patients [35].

Conclusion

Despite dentists' awareness of the evident necessity for dental care during pregnancy, this is not always reflected in the current professional practice. The findings prompt a Curriculum change in undergraduate courses and greater availability of training and retraining courses on this very important topic. Overall, the knowledge of students regarding management of a pregnant patient was limited.

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