

Oral Surgery For The Pregnant Patient

Dr. Imran Khan

Assistant Professor & Incharge

Department of Oral & Maxillofacial Surgery, Faculty of Dentistry, Jamia Millia Islamia, New Delhi- 25

Dr. Mohd. Irfan Ansari

Assistant Professor

Dr. Rizwan Khan

Resident, Department of Paediatric
GTB Hospital, Ghaziabad

The purpose of this article is to update oral surgeons & our fellow dental surgeons on approaches for perioperative management of the pregnant patient. Knowledge of the physiologic changes from a non gravid to a gravid (Pregnant) woman is of utmost importance to the dentist or the oral & maxillofacial surgeon in his/her ability to manage patient population. To understand the management of these patients one should know the ethical principles that apply in this situation, followed by their relevant physiologic changes & their treatment implications, the risk of various medications to mother & fetus, the management of concomitant medical problems in the pregnant patient appropriate timing in oral surgery during pregnancy & management of emergencies during pregnancy.

Ethical considerations in the Management of the Pregnant Patient

Because treatment of the pregnant patient has the potential to affect the lives of two individuals (the mother & the unborn fetus), certain ethical principles have been developed to govern treatment decisions that the dentist or the oral surgeon must consider in the care of their pregnant patients.

The first ethical principle is obvious one; the well being of two patients must be considered, also plan of treatment should be designed to maximize the benefit to the mother while minimizing the risk to the fetus principle is further developed by the following ones. The best support of the fetus support of the mother. Biologically, we know that the ultimate foetal incubator is the mother's uterus. Thus, a healthy mother provides the best condition of delivery of a healthy baby.

The mother should not be denied necessary medical or dental treatment because she is pregnant.

As separate individuals with their own rights & responsibilities, mothers have a right to optimum health care. Using currently available medical resources the fetus is considered viable at twenty five weeks.

The risk of an adverse outcome of pregnancy does not seem to be increased in pregnant women who undergo dental procedures & oral surgeries, but complications such as sepsis or airway compromise may affect the outcomes of pregnancy. The decision to perform a surgical procedure under GA on pregnant women does carry some risk of adverse outcome. Therefore it's best suggested to the dentist or the oral & maxillofacial surgeon to consult with a patient's obstetrician or other medical specialist in given clinical situation. Now, these principles provide a framework to the oral & maxillofacial surgeon in medical decision making for the pregnant patient.

Physiology of Pregnancy & Treatment Considerations

During pregnancy, the normal physiologic mechanisms for maintaining homeostasis undergo marked changes. Specifically, systemic alterations with respect to

the cardiovascular, respiratory & hematologic systems warrant careful monitoring by the surgeon. Gastrointestinal, renal & endocrine alterations also warrant mention, because they may require modifications of treatment protocols.

Cardiovascular Alterations

Compared with the non pregnant female patients, the pregnant patient shows significant changes in blood volume & cardiac output & changes in systemic vascular resistance & blood pressure. The total blood volume in the pregnant patient can increase up to 50% by 32 weeks gestation. This rise can be attributed primarily to a rise in plasma volume & secondary anaemia.

In contrast to changes in cardiac output, blood pressure decreases early in pregnancy returning to baseline levels by the end of second trimester.

Treatment considerations

Because of the increased abdomino pelvic mass, there is the potential for significant compression of the inferior vena cava by the fetus when the pregnant patient is placed in a supine position. As a result of this compression, venous return to the heart is impaired, causing a decrease in stroke volume & a compensatory baroreceptor stretch reflex to maintain cardiac output. This **supine hypotension syndrome** is clinically characterized by hypotension, syncope & bradycardia. To prevent or alleviate the supine hypotension, the pregnant patient should be rolled to the left side by five degrees to fifteen degrees, (a position in which right hip is elevated 10-12 cm) which can be accomplished by inserting a wedge or a pillow under the right hip. If this is also not working for the patient then the patient can be placed in full left lateral position.

Respiratory alterations

Changes in respiratory physiology in the pregnant patient are partly caused by the increased oxygen demands of the maternal-foetal systems. There are notable increases in tidal volume & minute ventilation rate, which are caused by superior displacement of the diaphragm. As a result of this displacement there is a rise in intrathoracic pressure which leads to an increase in the antero-posterior diameter of the thorax & chest circumference. In addition to the increases in ventilation, there are concomitant decrease in oxygen reserves & increase in oxygen demand. Decrease in the oxygen reserve is significant because they predispose the mother & fetus to hypoxia.

In addition to the pulmonary physiology, there are significant mucosal changes in the upper airways. The mucosa of the upper airways has a tendency to become friable & oedematous. Up to one-third of pregnant women experience severe rhinitis, which predisposes them to nose bleeds & upper respiratory tract infections.

Treatment considerations

Because of the effects of hyperventilation a pregnant

patient can present with mild respiratory alkalosis. Research has demonstrated 25% of pregnant patients develop moderate hypoxemia & some develop an abnormal alveolar-arterial oxygen gradient when laced in supine position. Ventilation patterns & patient position must be adjusted for the pregnant patient so as to avoid hypoxemia.

Hematologic Alterations

Hematologic alterations in the gravid patient include an increase in the number of erythrocytes & leukocytes, erythrocyte sedimentation rate, & most of the clotting factors, causing a hyper coagulable state. There is also a relative decrease in blood haemoglobin concentration. Although the plasma volume & the erythrocyte volumes increase in the gravid patient, the increase in volume of the plasma exceeds that of erythrocyte, which leads to a physiologic anaemia.

Treatment considerations

Given the relative increase in clotting factors (vii-x) & decrease in anti clotting factors (xi, xiii), pregnant women are at an increased risk for thromboembolic events. It has been reported that pregnant women have five fold increases in the likelihood of thrombotic events, compared to non pregnant patients. The treatment of choice for a pregnant patient with a confirmed thromboembolic event is anti coagulant therapy. Anticoagulant prophylaxis is recommended for a pregnant patient with a history of thrombotic disease. For these patients low molecular weight heparin is preferred because it does not cross the placenta.

Gastrointestinal Alterations

The most prominent gastrointestinal changes occurring in the gravid patient are related to the changes in the intragastric pressure, hormonal changes & alterations in the hepatic function. GI changes include episodes of nausea, vomiting & pyrosis (heart burn). Approximately two-thirds of the pregnant patients complain of nausea & vomiting with peak frequency at the end of first trimester.

Treatment considerations

For the pregnant patient with frequent or excessive vomiting, **morning appointments should not be scheduled.** A patient also should be advised to avoid foods that could initiate nausea/vomiting, especially fatty foods. Frequent episodes of vomiting can result in dehydration & electrolyte imbalances. **Patients with frequent vomiting should be encouraged to drink electrolyte-rich fluids.** Changes in the serum concentrations of the liver proteins, particularly albumin, can lead to peripheral edema caused by loss of oncotic pressure. Because of concomitant hemodynamic changes in blood pressure extremity edema should be monitored carefully before & during treatment of the pregnant patient.

Drugs used in Dentistry, Oral & Maxillofacial Surgery

Oral & Maxillofacial surgeons encounter pregnant patients in daily practice. Understanding the safety of commonly used & prescribed medications minimizes adverse outcomes.

Local anesthetic agents

Lidocaine & other commonly used local anesthetic agents have been associated with foetal malformations

Author Guidelines

Dear Dr.

Healtalk Dental Journal is indexed with international serial series number 0975-6329

If you want to send some article please read the follow :

Healtalk dental journal solicits articles of all the dental specialties. Those who wish to contribute to the dental journal should send the matter at the editorial office. We reserve the right to edit the articles. Please note that we prefer case studies & case review type article. We reserve the right to reject articles without assigning any reason.

Selection of articles will be the sole discretion of the editorial board. Unselected articles will not be returned. Please send your brief bio data & passport size photograph along with the article. Ideally the articles should be approximately of about 1400 or above words. We would prefer the article in word format only. Also send the images in high resolution i.e. Minimum 300dpi in JPEG ext.

Authors from India are requested to send article by E-mail:

article_ht@yahoo.com

article.ht@gmail.com

And also authors from India are requested to send article on a CD along with two printout on the below address:

The authors photographs & a brief bio-data must accompany all the articles.

AfzaA.

Chief Co-ordinator

(Mkt., Advt. & Circulation)

967/21-C, Housing Board Colony,

Faridabad (Haryana)

Handy : 9027637477

especially in the 1st trimester. The main concern in using these agents is over dose with increased vascular volume & permeability. Thiopental for local anesthetic toxicity is higher in pregnancy. Maximum allowable dosage should be reduced proportionally. Epinephrine should be used judiciously in patients with pregnancy associated hypertension.

General anaesthetic agents

Fortunately, most general anesthetic agents have low teratogenic potential. Mazze & Kallen studied 720,000 pregnant women who underwent 5405 non obstetric operations & found no association between anesthesia, exposure & adverse foetal outcome. In most studies nitrous oxide, halothane, ketamine, methohexital, etomidate & thiopental have been found to be safe. **Nitrous oxide has been implicated in decreased fertility & spontaneous abortion in women with an occupational exposure to it.** More recently introduced scavenging & ventilation methods reduce this problem.

Analgesic agents

Acetaminophen is the most widely used analgesic agent in pregnancy. It has not been associated with increased risk of congenital anomalies. Some data implicate salicylates in cases of spontaneous abortion & foetal gastroschisis, but most investigators have not found any association between the use of salicylates, such as aspirin, and foetal anomalies. Low-dose aspirin has been used to prevent pre-eclampsia with no identifiable cardiac defects.

Among the NSAIDs ibuprofen, diclofenac sodium & ketoprofen have been most frequently used in pregnancy. Use of these drugs in early pregnancy has been associated with an increased risk of cardiac septal defects. By inhibiting prostaglandin synthesis, they may also cause delayed partition. In general, NSAIDs should be avoided, especially during late pregnancy.

Narcotic Analgesic Agent

Fortunately for oral & maxillofacial surgery, narcotic analgesic agents have not been associated with foetal anomalies. They can, however, cause neonatal narcotic withdrawal syndrome when the mother is addicted to narcotics.

Antibiotics

Common antibiotics : Perhaps the most common reason an oral & maxillofacial surgeon is called on to treat a pregnant patient is infection. The teratogenic potential in human ranges from none (penicillin) to unlikely (chlorthalphenicol, doxycycline & rifampin) to undetermined (clindamycin, gentamycin & vancomycin). The quinolones have been associated with irreversible arthropathy & cartilage erosion in foetuses of multiple animal species. The fluoroquinolones are not recommended for treatment of oral & maxillofacial infections in child or pregnant patient. The macrolides, such as erythromycin, azithromycin & clarithromycin, do not cross the placenta to any significant extent. They do not cause any foetal anomalies. The tetracyclines are to be avoided in the pregnant patient & in children up to 12 years of age because of prominent dental staining.

Metronidazole is an antianaerobic antibiotic that has

been previously show to be carcinogenic & mutagenic in certain bacteria. In more than 17,000 fetuses exposed to the metronidazole in the first trimester, however there was no increase in rate of congenital anomalies. Another analysis by Burtin & colleagues found no increased teratogenic risk use of metronidazole. Use of metronidazole seems justified for significant oral & maxillofacial infections in the pregnant patient.

Antifungal agents : Nystatin & clotrimazole have not been associated with congenital defects when they are used for vaginal candidiasis. Pregnant women demonstrate an increased susceptibility to vaginal colonization & infection by yeast, & antifungal agents including griseofluvin & ketoconazole, which may be associated with foetal malformations & should be avoided in pregnancy. Amphotericin B remains the drug of choice for the treatment of deep & life-threatening fungal infections in pregnancy.

Antiviral agents : Acyclovir & valacyclovir are antiviral antibiotics that can be used to treat herpetic infections. The limited information available, most of which is for acyclovir indicates no increase in foetal anomalies & no distinctive pattern of foetal defects, although further research is required to clarify the safety spectrum of these agents. Topical use of acyclovir results in minimal systemic absorption. When a significant benefit is expected, these antiviral agents may be used.

Steroid Anti-inflammatory Drugs

Prednisolone have been used clinically in pregnant patients, especially for treatment of severe asthma, without adverse effects on the fetus. Triamcinolone & beclomethasone are teratogenic in animals but have not been associated with foetal defects in humans.

Oral & Maxillofacial Procedures in Pregnant Patients

Dento-alveolar & elective procedures : Given the significant alterations in the physiology seen in the pregnant patients & high cost of adverse effects (especially considering risks to mother & child), oral & maxillofacial surgical treatment of the pregnant patient should be undertaken only in emergent situations. Elective procedures (eg. Cosmetic surgeries, orthognathics) should be delayed until the postpartum period. Some elective & emergent dentoalveolar procedures are more safely during the second trimester. This practice concerns associated teratogenic concerns associated with early pregnancy & physiologic problems & patient position concerns seen in the third trimester. Dentoalveolar surgery should be directed toward the relief of pain, elimination of infection & neoplasia & repair of traumatic injuries.

If treatment is to be rendered, the patient should not be placed in the supine position because of the possibility of supine hypotensive syndrome & increased risk of deep vein thrombosis.

Ideally the patient should be positioned in the left lateral decubitus position, with the right hip elevated laterally by 15 degrees above the surface of the chair. In the event of a syncopal episodes or if cardio pulmonary resuscitation is required patient position is paramount. The left lateral displacement of the uterus can be accomplished manually by a member of the resuscitating team by tilting

the table /chair laterally or by placing a wedge between the right hip. This step is especially important in cardiopulmonary resuscitation. Judicious selection of pharmaceutical agents should be made to minimize the risk of complications to the mother & the fetus.

Oral Radiography & Radiation safety

Animal & human studies have demonstrated that adverse events related to radiation exposure, such as congenital foetal abnormalities, require a radiation dose of > 10Gy (5 Gy in the first trimester, when organogenesis is initiated). It has been estimated that the dose to the fetus is approximately 1/50,000 of that to the mother's head. Given these estimates the exposure to any radiographic films required in the oral & maxillofacial region should not place fetus at increased risk. But nevertheless adequate shielding & protective equipment must be required at all times.

Trauma

Trauma occurs in 5% of pregnancies. Motor vehicle accidents account for more than 50% of all cases of trauma during pregnancy. They are responsible for 82% of fetal deaths caused by trauma. In general, a multidisciplinary approach involving maternal & fetal medicine, neonatology, anaesthesiology & intensive care medicine is necessary for optimizing outcomes in cases of severe trauma.

Domestic violence is another potential concern when a pregnant woman suffers maxillofacial trauma. The pregnancy may place additional stresses on the mother's significant relationship & living situation.

The treatment of maxillofacial trauma in the gravid patient is not significantly different than other patients, with the following exceptions: maternal & fetal stability must be assessed. Obstetric examination, consultation, & clearance are often required in these patients. The need for fetal monitoring must be determined. Definitive airway control by intubation or tracheotomy may be required when the patient's ability to maintain her own airway is questionable. Once patient is stable, extra oral & intraoral examinations are accomplished. If facial fractures are present, rigid fixation of maxillary & mandibular fractures is advisable to avoid or minimize the period of maxillomandibular fixation. This approach allows the restoration of adequate nutrition as rapidly as possible & minimizes aspiration risk. The mucosa of the oral cavity & the oropharynx must be evaluated carefully because it is more friable & hemorrhagic than normal.

Infections

Head & neck infections should be managed aggressively in the gravid patient. There is a mild degree of immunosuppression in pregnancy, & sepsis is known to occur more in pregnant women than nonpregnant women. Severe septic complications that occur in pregnancy are associated with an increased risk of adverse foetal outcomes. Early incision & drainage of odontogenic infections are indicated, as is appropriate use of antibiotics. Primary concern should be given to airway security.

Pathology

Mucosal & skin changes are commonly seen during pregnancy & are secondary to hormonal alterations. The most common changes include increased pigmentation in

the maxillofacial region, gingival disease, pyogenic granuloma & changes in salivary gland physiology. Changes in the pigmentation of the skin in the maxillofacial region, which typically appear as a bilateral brown patches, begin to appear in the first trimester & are seen in most pregnant women. Increase in estrogens & progesterone have been suggested to cause the alterations in the pigmentation, although true mechanism remains unclear.

Gingival changes in the pregnant patient include increased **pregnancy gingivitis & gingival hyperplasia**. Pregnancy gingivitis is typically & gingival hyperplasia. Pregnancy gingivitis is typically an exacerbation of a pre-existing condition & it primarily effects the marginal gingiva & interdental papillae. Gingival hyperplasia is thought to be caused by increased capillary permeability within the gingiva because of increased amounts of circulating estrogens.

Pregnancy tumor, or pyogenic granuloma is a swelling that typically occurs on the labial aspect of the dental papilla in approximately 1% to 5% of pregnant women. Pyogenic granulomas are most likely to occur during first or second trimester & usually resolve in the post partum period. Hormonal changes that result in increased angiogenesis & local factors, such as plaque-induced gingivitis, are thought to play an etiologic role.

An increased body of evidence suggests that untreated periodontal disease in the pregnant patient is associated with adverse pregnancy outcomes, including preterm delivery & low birth weight. Although many studies have evaluated this association & have potential for confounders, a suitable causal explanation has not been established. The pregnant patient should be strongly encouraged to maintain good oral hygiene to minimize these effects. Fortunately, more oral pathologic conditions are benign, slow growing, & non-life threatening.

Conclusion

Practicing oral & maxillofacial surgeons must consider the well-being of mother & fetus without compromising the quality of care provided to the mother & fetus without compromising the quality of care provided to the mother. As our knowledge of the physiology & applicable pharmacology unfolds, oral & maxillofacial surgeons can apply accepted principles & new discoveries to the treatment decision for the pregnant patient. In summary, oral & maxillofacial surgeons should avoid elective surgery in a pregnant patient, if possible. Routine dental health procedures should be accomplished before conception in planned pregnancies & during the middle trimester in unplanned pregnancies. Oral & maxillofacial surgeons may be called on to treat urgent or emergent cases involving trauma, infection & pathology whose treatment cannot be postponed. Active treatment is directed towards optimizing maternal health while minimizing fetal risk.