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Pregnancy and Dentistry: A Guide for the General Dental Practitioner. Part 2

Abstract: Pregnancy is a unique time in a woman's life with many physiological, physical, emotional and hormonal changes occurring. It can also be quite an anxious time for women particularly in the first trimester when the risk of miscarriage is at its highest. Uncertainty still exists around the topic of dental treatment and care during pregnancy, which may create challenges for both the patient and the dental team.

CPD/Clinical Relevance: The treatment options available when managing pregnant patients and for safe prescribing for this population are described.

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Providing dental treatment for a pregnant patient can be anxiety inducing for both the dentist and the patient. As with any dental treatment, the risks and benefits of all treatment options should be discussed comprehensively with the patient before proceeding.¹ Pregnancy should not be a contraindication for dental treatment, and there is no evidence to suggest that dental treatment is associated with any harm to the developing baby. However, the most critical stage of fetal development occurs in the first trimester and it would therefore be sensible to avoid elective treatment, if possible, until the second trimester. A pregnant woman may prefer, however, to delay elective treatment entirely until

the baby is born. Any decision to delay treatment should be balanced against the risk of the woman developing pain and infection during pregnancy.

Patient positioning

Patient positioning in the dental chair during the second and third trimesters is a key consideration. During these trimesters, women are advised not to lie supine on their backs as the weight of the developing baby and expanding uterus can partially occlude the inferior vena cava. Occlusion of this large vein will reduce venous return and subsequently, cardiac output. This may cause a reduction in blood flow to the

fetus. Lying supine on the dental chair may also increase the risk of syncope when the patient stands up. This is due to hypotension secondary to decreased venous return in conjunction with any anxiety about dental treatment that the patient may be experiencing.

As a result of the above, if during treatment, a pregnant patient is required to lie flat for a procedure, then it would be wise to provide a support, such as a pillow, for the patient on the right side of their body so that a lateral tilt can be achieved. Tilting the patient to their left side at an approximate 15-degree tilt has been shown to be adequate to overcome this venous occlusion. After dental treatment, care should be taken to raise the chair slowly to allow their blood pressure to regulate and avoid postural hypotension and syncope.

Should a patient experience syncope during or after treatment, they should be laid flat, but also tilted onto their left side and their legs raised to encourage blood flow from their legs.

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Drug group	Safer to use	Caution	Absolute contraindication
Analgesic	Paracetamol	Aspirin	
		Ibuprofen	
		Dihydrocodeine	
Antimicrobials	Amoxicillin	Clinadamycin*	Doxycycline
		Metronidazole*	Tetracycline
Antifungals	Nystatin	Fluconazole	
		Miconazole	
Local anaesthetics	Lidocaine	Prilocaine	
		Tetracaine	
		Benzocaine	
		Mepivacaine	
		Bupivacaine	
		Articaine	
Conscious sedation		Nitrous oxide	
		Midazolam	

Table 1. A summary of the commonly prescribed drugs in dentistry and their suitability for use during pregnancy. *Avoid in first trimester.

Drug prescribing in pregnancy

Caution must be exercised with drug prescribing when managing the pregnant dental patient. Physiological and physical alterations accompanied with pregnancy may affect drug pharmacokinetics, and the potential for teratogenic effects of drugs are another key consideration. Where possible, the authors recommend, that all prescribed medication should be avoided during pregnancy and especially during the first trimester. Any prescribed drugs should be risk assessed and prescribed only if their benefits outweigh the potential risks. Table 1 provides a summary of drugs commonly prescribed in dentistry and their suitability for use during pregnancy.

Analgesics

Odontogenic pain should be managed at the earliest possible opportunity in pregnant patients to protect the health of both the mother and baby. The primary aim should be to eliminate the source of pain by carrying out the necessary dental treatment and providing pain relief advice as an adjunct if necessary. Emergency dental treatment should not be avoided because the patient is pregnant.

Non-steroidal anti-inflammatories such as ibuprofen should be avoided in all stages of pregnancy, but especially in the third trimester because they have been associated with delayed closure of the ductus arteriosus in the baby, increased risk of bleeding and ineffective contractions during labour.^{8,9} Pregnant women may be prescribed low-dose aspirin throughout their pregnancy for the prevention of pre-eclampsia for example; however, its use for odontogenic pain should be avoided.^{8,9} The use of dihydrocodeine should also be avoided, especially in the third trimester, because its use during labour may cause respiratory depression in the baby.⁹

If analgesia is indicated, paracetamol is the drug of choice using the standard dose of 500–1000 mg every 4–6 hours, to a maximum of 4 g per day. There are no known harms associated with its use in any stage of pregnancy as long as the correct dosage is adhered to by the patient.^{8,9}

Antimicrobials

Antimicrobials should not be a substitute for active treatment, such as incision and drainage, or extraction, if the patient presents with an infection. Where extensive swelling or systemic involvement is present

Radiography/imaging

Dental radiographic imaging is not contraindicated during pregnancy. The routine use of a lead apron is not recommended for intra- and extra-oral imaging where the primary beam does not point directly at the patient's abdomen.^{2,3} The operator should follow all good practice principles, including rectangular collimation, paralleling technique and keeping the dose as low as reasonably possible. If the primary beam must point directly at the patient's abdomen, then a lead apron should be used to protect the developing baby.^{2,3}

For cone beam CT, if the exposure cannot be delayed until after the baby's delivery, then a lead apron should be considered for a pregnant patient.³

Radiographic investigation is a very emotive topic for pregnant patients, and any decision to carry out a radiographic exposure should involve a full discussion and valid consent. The British Institute of Radiology advises that if a patient wishes, a lead apron may be used for dental radiography for 'psychological purposes of reassurance as unlikely to be detrimental to the diagnostic quality of the images'.³

Amalgam

To fulfil the requirements of the Minamata Convention on Mercury,⁴ new environmental restrictions came into law in the UK in 2018. These restrictions aimed to reduce the impact of mercury pollution on the environment by preventing the unnecessary use of mercury in products and manufacturing processes, including dentistry.

To facilitate the implementation of these restrictions, the Scottish Dental Clinical Effectiveness Programme issued guidance in 2018 on the use of amalgam in pregnant patients, which advised that 'dental amalgam shall not be used for dental treatment of... pregnant or breastfeeding women, except when deemed strictly necessary by the dental practitioner based on the specific medical needs of the patient'.⁵

Dental amalgam has not been identified as a health risk to pregnant patients or the developing baby.^{6,7} However, restorations can release small amounts of mercury, particularly during placement and removal and so, a cautious approach to placement and removal during pregnancy should be taken.

and antimicrobial therapy is indicated, amoxicillin is the first choice.¹⁰

For pregnant patients who have a penicillin allergy, clindamycin may be prescribed if they are in the second or third trimester; however, caution is advised for its use in the first trimester due to limited available safety data.⁸

Metronidazole is not specifically contraindicated during pregnancy; however, due to a lack of safety data, caution is advised for its use during the first trimester and a high-dose regimen should be avoided in all trimesters.⁹

Tetracycline antibiotics, both in oral and topical form, are contraindicated during all trimesters of pregnancy owing to their association with bone and dental abnormalities in the fetus, and maternal liver toxicity.⁸

Antifungals

Fluconazole and miconazole should both be avoided, if possible, during pregnancy. Fluconazole has been linked to an increased chance of miscarriage and congenital abnormalities in the developing baby^{8,9} and miconazole has been shown to be toxic at high doses in animal studies.⁸ There is negligible absorption of nystatin from the gastrointestinal tract and so, it is thought to be safe, if it is necessary, during pregnancy although long-term safety studies are not available.⁸

Chlorhexidine

There are no reported harms to the developing fetus associated with the use of 0.2% chlorhexidine gluconate mouthwash or 1% gel.^{11,12}

Endodontic pastes

Ledermix (Henry Schein UK Holdings Ltd) paste is composed of demeclocycline, a tetracycline antibiotic, and triamcinolone acetonide. It is not recommended for use in pregnancy unless considered essential.¹³

Fluoride

Fluoride toothpaste purchased over the counter is safe to use during pregnancy; however, at high doses in animal studies, fluoride has been linked to toxicity in the fetus. For pregnant patients at high risk of caries, sodium fluoride 2800ppm toothpaste is safe to use during pregnancy, but sodium fluoride 5000ppm should be avoided.^{14,15} If prescribing sodium fluoride 2800ppm toothpaste

for a pregnant patient, instructions on the appropriate use of the toothpaste, ie a 2-cm ribbon of toothpaste, should be given.

Fluoride varnish is not recommended for use during pregnancy as it contains 33.8% ethanol with each dose containing 0.2 g of alcohol.¹⁶

Local anaesthesia

There is an absence of randomized evidence examining the safety and use of local anaesthetics in pregnant patients.¹⁷ However, local anaesthetics are considered to be safe during pregnancy, with 2% lidocaine considered to be the ideal agent because of its lower concentration compared with prilocaine, mepivacaine and articaine local anaesthetic solutions.¹⁸

Prilocaine has, along with the topical local anaesthetics tetracaine and benzocaine, been implicated in the development of acquired methaemoglobinemia.¹⁹ Methaemoglobinemia is a rare, but potentially serious, complication caused by oxidation of the iron molecule within the haemoglobin molecule rendering it unable to transport oxygen, potentially leading to hypoxia of both the mother and the fetus.²⁰ For this reason, prilocaine, benzocaine and tetracaine should be used with caution in pregnant patients.

Although plain local anaesthetic solutions are available, vasoconstrictors are usually added to local anaesthetic solutions to prevent systemic uptake of the solution, improving the depth and duration of the local anaesthetic, and minimizing the risk of systemic toxicity of the local anaesthetic agent.¹⁸

The most commonly paired vasoconstrictor is adrenaline.²¹ The doses of adrenaline administered for the purposes of dental local anaesthesia is very low and unlikely to significantly affect uterine blood flow.^{18,22}

The second most common vasoconstrictor used is felypressin, which is normally paired with 3% prilocaine. Felypressin is structurally similar to oxytocin and theoretically poses a risk of inducing labour, although, again, this is unlikely at the doses used in dental anaesthesia.²³

The benefits of vasoconstrictors justify their use; however, it is prudent to employ a careful injection technique with aspiration to reduce the likelihood of inadvertent intravascular injection.²²

Conscious sedation

For pregnant patients who require emergency dental care and have significant dental anxiety, non-pharmacological methods should be used first to facilitate dental care. Conscious sedation using nitrous oxide or midazolam should be avoided during pregnancy.²⁴ If, however, pharmacological anxiety management is required, the patient should be referred to a secondary care setting for assessment and treatment. Although midazolam and nitrous oxide are not contraindicated during pregnancy, there is a risk that the effect of the drugs may cause harm to the developing baby, and the risk of an atypical response to sedation is higher due to the physiological changes that occur during pregnancy.²⁴

Conclusion

Pregnant patients should be actively encouraged to attend for regular examinations and given comprehensive and tailored preventative advice. Dental treatment during pregnancy is both safe and effective, and pregnancy should not be a barrier to necessary treatment for the patient. In all cases, the dentist should proceed sensitively, acknowledging any concerns of the patient and making shared decisions about the optimal timing of any proposed treatment.

Compliance with Ethical Standards

Conflict of Interest: The authors declare that they have no conflict of interest.

Informed Consent: Informed consent was obtained from all individual participants included in the article.

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