

# Physician's knowledge about dental treatment during pregnancy

## Visão médica do tratamento odontológico em gestantes

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### ABSTRACT

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#### Objective

To guide pregnant patients, as regards their general and oral health, thus justifying the need to have regular prenatal and dental care, is an obligation of health professionals. Physicians, especially gynecologists and obstetricians play an important role, since they are the first professionals to take care of pregnant patients.

#### Methods

The objective of present study was to evaluate physician's knowledge about dental treatment during pregnancy. Methods: Using questionnaires, 40 gynecologists and obstetricians were evaluated as regards their knowledge of dental care, and use of drugs and dental anesthetics in dental procedures during pregnancy.

#### Results

Many myths referring to dental care in pregnant women were observed. Many physicians have knowledge about association between susceptibility to gingivitis/periodontitis and pregnancy. With reference to local anesthetics and vasoconstrictors used in dentistry, the physicians still have some doubts about their use, even with the literature supporting their safety in this period. It is intended to continue these contacts with the obstetricians, in order to extend their knowledge and seek multidisciplinary cooperation, which would promote adequate and complete prenatal care.

#### Conclusion

It could be concluded that there are some divergences between obstetricians and dentists concerning dental care in pregnant women, which means losses for the patient.

**Indexing terms:** Dentist-patient relations. Obstetrics. Pregnancy.

### RESUMO

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#### Objetivo

Avaliar o conhecimento destes profissionais sobre o tratamento odontológico na gestação.

#### Métodos

Por meio do emprego de questionários, 40 médicos ginecologistas/obstetras tiveram seus conhecimentos avaliados no que se refere ao atendimento odontológico em gestantes e utilização de medicamentos e anestésicos pelos dentistas.

#### Resultados

Com este estudo pôde-se observar que ainda existem muitos mitos em relação ao atendimento odontológico no período gestacional. Muitos médicos estão cientes das possíveis associações entre gravidez e aumento da suscetibilidade de problemas periodontais, por atuação hormonal. Quanto ao emprego de anestésicos locais e vasoconstritores, os médicos ainda apresentam grande receio em indicá-los, mesmo a literatura suportando a segurança de sua utilização e indicando a necessidade de intervenção odontológica neste período. Pretende-se continuar estas avaliações e contatos com os médicos obstetras, estendendo o conhecimento dos mesmos e buscando a atuação multidisciplinar, o que promoveria um pré-natal adequado.

#### Conclusão

Conclui-se que ainda há divergências entre médicos obstetras e dentistas no que se refere ao atendimento odontológico das gestantes, o que pode trazer prejuízos para a própria paciente.

**Termos de indexação:** Relações dentista-paciente. Obstetrícia. Gravidez.

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## **INTRODUCTION**

Pregnancy is a unique physiological process in a woman's life that involves a series of both psychological and physiological changes that affect health in general. It is the obligation of health care professionals to instruct pregnant woman about oral and general health care and emphasize the importance of periodical prenatal and dental consultations<sup>1</sup>.

Physicians, particularly gynecologists/obstetricians, play an important role, as they are the first professionals to interact with pregnant women. Therefore, it is essential to analyze their knowledge and attitudes as well as assess the health professionals' behavior with regard to dental treatment in pregnant women and guidance offered to them for the newborn<sup>2</sup>.

The health area has failed, through fear or omission, by failing to adopt a professional and safe approach to the dental problems of pregnant women. The majority of pregnant women have a phobia about dentists, and their main reason is the fear that anesthesia could harm the fetus and cause oral hemorrhages<sup>3-4</sup>.

In general, the pregnant women must be informed about treatments needed in a clear and objective way. Basically, three limitations involve the practice of dental treatment: impossibility to perform prolonged treatment, especially in the supine position, attention to prescription drugs, and care in the use of X-rays.

The prevalence of caries disease does not necessarily increase during pregnancy, as has previously been reported. It is believed that during pregnancy, some pregnant women have an increased risk of developing caries due to the difficulty in maintaining proper oral hygiene, nausea and because of the desire to consume sugary foods, increasing the number of streptococcus mutans and the possibility of transmitting these microorganisms to their babies<sup>5</sup>.

Dental radiography should be used cautiously during pregnancy and only if it contributes significantly to the diagnosis of a problem and treatment planning<sup>2</sup>.

The risk of reaching a teratogenic threshold dosage of radiation related to dental radiographs is less than 0.1%, or 1,000 times less than the risk of spontaneous abortion and malformation<sup>6</sup>.

The use of prenatal fluoride administration in pregnant women to protect their children's teeth has been the subject of much discussion for several years<sup>7</sup>. Prenatal fluoride prescription needs more information

on the following: lack of reliable clinical results in terms of efficiency; significance of intrauterine mineralization; importance of current concepts of the mechanism of action of fluoride (which is important when constantly present in the oral cavity, participating in the process of demineralization and remineralization); empirical dose/effect association and when it is prescribed, it is combined with minerals/vitamins, which would reduce its absorption<sup>8</sup>.

Pregnancy is not the cause of periodontal disease, but it aggravates a pre-existing condition<sup>9</sup>. Dental plaque is etiological factor and pregnancy increases tissue response to plaque modifying the clinical condition<sup>10</sup>. No significant gingival tissue alterations were found during pregnancy when local factors were absent<sup>11</sup>.

Research on the association of periodontal disease with preterm labor found that untreated periodontal disease in pregnant women may increase the risk factor for preterm birth (less than 37 weeks) or cause low birth weight (less than 2500g)<sup>12</sup>.

Taking into consideration that periodontal disease is a long-term effect of low-intensity maternal infection, inflammatory response is chronic. This response jeopardizes the maternal-fetal-placental unit and it can be measured by inflammatory mediators such as prostaglandin, endotoxin, cytokine and platelet-activating factor, which are present in the process of prematurity<sup>13</sup>.

With regard to systemic medications, it is known that the placenta is not an effective barrier against most drugs<sup>14</sup>. Once the drug has passed through the placenta, its effect depends on the ability of the fetal tissues to metabolize the substance, as well as the susceptibility of these tissues to the aggression<sup>15</sup>.

Due to the difficulty in establishing the action and therefore the effect of drugs during this period, the Food and Drug Administration (FDA) classified drugs into categories to guide their prescription to pregnant women<sup>16</sup>. These are arranged into categories A, B, C, D and X, in which the drugs classified as A are extremely safe and those belonging to X category are contraindicated at least at some time during pregnancy. Most medications used in dentistry fit into the B category and they are considered to be safe. The medications are as follows: lidocaine, amoxicillin, erythromycin stearate, metronidazole, potassium clavulanate, acetaminophen (paracetamol), and clindamycin. However, non-steroidal anti-inflammatory drugs (including diclofenac) belong to the D category in the third trimester of pregnancy and they must be avoided as they can present a risk to the fetus.

With regard to local anesthetics, they are not contraindicated during pregnancy. The decision to postpone dental treatment because of the need to use anesthesia must not be a routine, however, if treatment is elective and not urgent, postponing it to the second trimester of pregnancy is a good option<sup>15</sup>.

The amount of local anesthetic that could pass through the placenta depends on a series of factors, among them<sup>17</sup>: a) molecular size: small anesthetic molecules easily pass through the placenta and they are more toxic. Prilocaine crosses the placental barrier more quickly than lidocaine, mepivacaine or bupivacaine and if used in high doses it can cause methemoglobinemia. The passage of lidocaine and mepivacaine in the fetal circulation are practically equal, b) the extent of local anesthetic binding to the plasma protein in maternal circulation: All local anesthetic linked to the protein molecule does not pass to the fetus, whereas the free molecule easily passes through the placenta. Therefore, the greater the protein binding, the more protected is the fetus. Taking this aspect into account, bupivacaine is considered the safest drug during pregnancy with 95% of protein binding. However, it has a long duration of action, being indicated for surgical cases. The protein binding of Mepivacaine is 77%, lidocaine 64% and prilocaine 55% and c) fetal hepatic metabolism: the fetus easily metabolizes local anesthetic. The hepatic metabolism of mepivacaine is two to three times slower than that of lidocaine. Lidocaine is metabolized in the liver of the fetus at a slower speed than in the mother's liver<sup>18</sup>.

The local anesthetic of choice must be the one that provides to the pregnant patient. Based on this concept, anesthetic solutions should contain a vasoconstrictive agent in their composition with the goal of slowing down the absorption of anesthetic salt into the bloodstream, which would decrease the toxicity and increase the duration of anesthesia<sup>17</sup>.

The safety of using felypressin as a vasoconstrictive agent is uncertain since it has structural similarity with oxytocin, which can cause uterine contractions, although much higher doses would be needed than those present in a dental cartridge<sup>18</sup>.

With respect to epinephrine and norepinephrine, the body itself in a situation of stress (pain) releases endogenous vasoconstrictive agents to control the situation. The use of epinephrine at a ratio of 1:100,000 in healthy pregnant patients is safe. The release of endogenous epinephrine and norepinephrine increases forty times higher under stress than at rest<sup>19</sup>.

Because it is known that this discussion is important for good dental care of the pregnant woman and that the physician is the patient's primary source of information, the aim of this study was to evaluate the knowledge of these professionals regarding the most relevant issues of dental treatment during pregnancy.

## **METHODS**

To conduct the study, a questionnaire containing multiple-choice and objective questions was used and applied to 127 physicians who work at private clinics in the city of Curitiba (PR), and are doing a specialization course in obstetrics and gynecology. The questionnaires were handed to the physicians at their clinics by the researcher and were collected 7 days later. To participate in the study, it was necessary for the physician to have shown interest and given written permission by signing a term of free and informed consent. The physicians only returned 31% of the questionnaires completed.

After the questionnaires were collected, the data were analyzed descriptively and by percentage and were used to obtain the results and discussion.

The study was approved by the Research Ethics Committee of the School São Leopoldo Mandic under protocol No. 06/335.

## **RESULTS**

The results will be shown in tables to facilitate their understanding (Tables 1 and 2), according to the questions.

Among the main results, 80% of physicians prescribed fluorinated vitamin compounds to pregnant women. The majority of physicians (97.5%) believed that there was greater susceptibility to gingival inflammatory alterations during pregnancy and 71% attributed the risk of premature birth to periodontal infection.

With regard to the procedures adopted by dentists, 42.5% of physicians believe that vasoconstrictors used in dentistry could harm the mother and fetus.

On the other hand, 90% of physicians believe that use of X-rays could not harm the fetus.

The majority of physicians (58%) believed that lidocaine would be the best anesthetic to be used by the dentist, but 94% thought it would be better not to use the vasoconstrictor during local anesthesia for dental purposes.

**Table 1.** Results of questions applied to the obstetrician physician used in the questionnaire.

Questionnaire questions	Yes	No
Do you prescribe fluoride supplements to your patients?	80%	20%
Do you believe that there is greater susceptibility to gingival inflammation during pregnancy?	97.5%	2.5%
Do you believe there is any relationship of periodontal disease with preterm labor?	71%	29%
Do you believe that vasoconstrictive local anesthetics used dentistry are harmful for pregnant women?	42.5%	57.5%
Do you believe it is possible to take radiographs of pregnant women without it being detrimental to her or the baby?	90%	10%
With regard to conventional systemic drugs used in dentistry, is there any medication that should not be prescribed to pregnant women?	82.8%	17.2%

**Table 2.** Answers of physicians to the question: "If we choose local anesthetics, which salt would be more appropriate?"

Lidocaine	Bupivacaine	Mepivacaine	Prilocaine
58%	23%	11%	8%

**Table 3.** Answers of physicians to the question: "If we choose local anesthetics, which vasoconstrictor would be more appropriate?"

Epinephrine	Norepinephrine	Felypressin	No vasoconstrictor
3%	0%	3%	94%

## DISCUSSION

Taking into consideration the exposure to radiographs taken during pregnancy, 90% of physicians believe that it is possible to perform them if the following basic care is taken: short exposure time, use of ultra-sensitive radiographic films and lead apron. Among the 10% of physicians who contraindicated radiographs, they referred to the first trimester of pregnancy, due to fetal organogenesis and possible teratogenic effects due to radiation. Although it is known that the younger the cell, the greater the risk of teratogenicity, there is no evidence in the literature that dental radiation can harm the baby and it may be used when needed<sup>20</sup>.

Fluoride supplementation has been used for many years in order to protect the teeth of the fetus. The mineralization of deciduous dentition is not advanced enough at birth to for fluoride to accumulate in the enamel<sup>21</sup>. However, 80% of respondents still prescribe fluoride supplements to pregnant patients, believing that it will enter the placenta barrier and be deposited in the teeth of the fetus in order to protect them against caries and strengthen teeth. One should remember that in addition to the most important action of fluoride being topical, the vitamin complexes containing fluoride associate this fluoride with important mineral salts and vitamins whose absorption may thus be harmed<sup>8</sup>.

Of the physicians interviewed, 97.5% believe that there is a greater susceptibility to gingival inflammatory alterations during pregnancy. The literature confirms this

suspicion, since gingivitis is extremely common during pregnancy due to the presence of vasodilator hormones that exacerbate the inflammatory process, however, it should be remembered that the presence of biofilm is an essential factor for this condition<sup>10</sup>.

Although almost all physicians (97.5%) believed that there was greater susceptibility to gingival inflammatory alterations during pregnancy, only 71% of them believed that this disease was correlated to premature birth. The current literature has associated low-intensity chronic periodontal infection with the risk of premature delivery, low birth weight infants and preeclampsia<sup>13,22-24</sup>.

Despite the doubts regarding the existence of a mechanism that would associate periodontal infection with obstetric complications, especially preeclampsia, current research has shown, for example, that inflammatory mediators related to preeclampsia (TNF-alpha) found in the blood plasma of pregnant women with this alteration, are increased to an even greater extent in the presence of periodontitis<sup>25-26</sup>.

Furthermore, a recent meta-analysis sought to enumerate the maternal infections related to the risk of developing preeclampsia concluded that periodontitis could be included in these morbidities<sup>27</sup>.

The use of vasoconstrictive local anesthetics is the most controversial subject when the dental treatment of pregnant women is discussed. Although 57.5% of the physicians believe that vasoconstrictive local anesthetics can be used during pregnancy without harming the pregnant women, 42.5% affirm that the vasoconstrictors can cause placental vasoconstriction, hypertension, cardiopathies and placental displacement. It should be remembered that the scientific literature does not contraindicate the use of vasoconstrictors during pregnancy, particularly in healthy pregnant women, since not using them could lead to a painful treatment, causing the release of harmful endogenous agents<sup>17</sup>.

With regard to the choice of anesthetic salt, 58% of physicians indicate the use of lidocaine as the salt of choice. The second option was bupivacaine by 23% of the respondents. Mepivacaine was the choice of 11% of the obstetricians and prilocaine was the least recommended, being the one of choice of 8% of the physicians. To choose the anesthetic salt, according to the literature, it is necessary to assess the amount of local anesthetic that will pass through the placenta<sup>17</sup>. This will depend on one of the following factors: molecular size, the extent of anesthetic binding to the maternal plasma protein and fetal metabolism of the drug. According to these

factors and in agreement with the majority of physicians interviewed, the anesthetic salt of choice for the gestation period is lidocaine, classified as group B by Food and Drug Administration<sup>18,28</sup>.

There was a controversy regarding the indication of vasoconstrictors because many of physicians affirmed that they are not harmful (57.5%), but when asked which is the most suitable vasoconstrictor, they chose not to use the substance (94%). It must be emphasized that the anesthetic solutions should contain a vasoconstrictor agent in their composition with the goal of slowing down the absorption of anesthetic salt into the bloodstream, which would decrease toxicity and increase the duration of anesthesia. Without the use of this agent in anesthetic solutions, in addition to not having the vasoconstrictor, the anesthetic solution, which is a vasodilator, would be more rapidly absorbed, causing greater toxicity to the fetus<sup>28</sup>.

Once having opted to use a vasoconstrictor agent, only 2.94% of the physicians would use epinephrine. There is no support in the medical and dental literature for the concern about using this substance, which is also released endogenously. The physician often believes that the anesthetic cartridge has an excessive amount of this vasoconstrictive agent, however, it contains 0.018 mg (at the ratio of 1:100,000), which is too little and too close to the amount released endogenously at rest. It is worth remembering that not using these vasoconstrictive agents may cause pain during treatment, thereby increasing their plasmatic level by up to 40 times<sup>29</sup>.

With further reference to vasoconstrictors, it may be said that it is not advisable to use norepinephrine in pregnant women. Due to its almost exclusive action on the alpha-adrenergic receptors, the concentration of norepinephrine available in Brazil (1:50,000) could cause surface necrosis of the tissues on which it is deposited, therefore it must not be used to obtain hemostasis. In the United States of America this vasoconstrictor is not available for local anesthetic solutions in Dentistry<sup>29</sup>. In a review, it was suggested that epinephrine should be used for pregnant patients at a ratio of 1:200,000 or 1:100,000<sup>28</sup>.

Felypressin was also cited by 2.94% of the obstetricians as the vasoconstrictive agent of choice used during pregnancy. However, felypressin is structurally similar to oxytocin, which causes uterine contraction. Despite the small amount of felypressin contained in the dental cartridge, this vasoconstrictor is not the best option for Dentistry or pregnant women<sup>18</sup>.

According to all these evidences, one of anesthetic solution that provides greatest safety in the gestation period is the association of 2% lidocaine with epinephrine 1:200,000 or 1:100,000. It should be pointed out that performing the anesthetic technique correctly is as important as the appropriate selection of the anesthetic salt and vasoconstrictor. No more than 2 anesthetic vials (3.6 ml) should be used per treatment session, without forgetting to aspirate before and during the anesthesia procedure. These procedures will reduce the risk of systemic complications, pain and stress during injection of the drug<sup>18,28-29</sup>.

Another point of disagreement between physicians and dentists is related to the use of systemic medication during pregnancy. According to 82.8% of the respondents, there are medications that must not be used during the gestation period. Among them, the most mentioned types are antibiotics (without specifying the salt), antimetabolites, anti-inflammatory drugs (especially the non-steroidal anti-inflammatory agents) and acetylsalicylic acid.

Not all these medications are allowed as the placenta is not an selective barrier against most drugs<sup>14</sup>. Once the drug has passed through the placenta, its effect will depend on the ability of the fetal tissues to metabolize the substance, and the susceptibility of these tissues to the aggression<sup>14</sup>.

Amoxicillin, the antibiotic of first choice for oral infections in most cases, is classified as group B by the Food and Drug Administration, which is apparently safe to use during pregnancy. With regard to analgesics, the option should be paracetamol, but it must not be used without control<sup>30</sup>.

Non-steroidal anti-inflammatory drugs (NSAIDs) are medications that must be used with caution because they may cause harm, especially during the first and last trimester of pregnancy<sup>30</sup>.

A research showed that non-steroidal anti-inflammatory agents may not be safe to use during the first trimester of pregnancy. The authors suggest that when used at a time close to conception, NSAIDs decrease the chances of successful implantation of the egg in the uterine wall due to the importance prostaglandins have in this process. On the other hand, due to the different action mechanism of paracetamol, it was not shown to be dangerous during this period<sup>30</sup>.

Because NSAIDs decrease the systemic release of prostaglandins, the literature has shown, for example, that all the cyclooxygenase enzyme inhibitors (selective, non-selective and specific) act to stimulate constriction of the ductus arteriosus in the fetus, a blood vessel that prevents the fetal lung from receiving an excessive amount of blood. These drugs should be completely avoided in the

last trimester when the canal is physiologically preparing to close<sup>30</sup>. When anti-inflammatory action is needed, the option should be corticosteroid at a dose of 4mg (betamethasone), 1 hour before the procedure, since this drug seems to have less pronounced effects on the fetus and pregnant woman, particularly if used at the doses recommended in dentistry.

If in doubt when prescribing systemic medication, the dentist should contact the patient's obstetrician, since the physician knows the patient's general health situation.

## **CONCLUSION**

From the data presented, it could be concluded that even in view of all the contemporary scientific evidence, there are still many divergences with respect to

dental care for pregnant women from a medical point of view. Obstetricians continue to show some reluctance in allowing and indicating dental treatment during pregnancy, especially with regard to the use of X-rays, systemic medication and local anesthetics. The implementation of programs to disseminate researches with reference to this subject to obstetricians is suggested, in order to seek uniformity in their practices thereby improving the quality of care for pregnant women.

## **Collaborators**

P LASLOWSKI developed the project, collected the data and wrote the manuscript. GT POLITANO, SEP SILVA, DP RAGGIO and JC IMPARATO supervised and guided the study and contributed to the writing of the article.

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