

Correlation between Dental Pulp Pain and Hormonal Changes during Pregnancy- A Clinical Investigation

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ABSTRACT

Background: The hormonal and physiological changes that come with pregnancy are unique. The aim of this clinical investigation was to observe a correlation between dental pulpal pain and hormonal changes during pregnancy. **Methods:** Out of hundred pregnant females examined seventy four females were having tooth or teeth indicative of either pulpal therapy or root canal treatment (RCT). On explaining their dental status forty pregnant females with no pain or mild pain agreed to take dental treatment, they were grouped as Group A and the remaining thirty-four who were reluctant and refused dental treatment were classified in Group B. **Results:** In Group A, thirty-five pregnant got their dental treatment completed along with regular Obstetrics & Gynecological (Obs&Gyne) follow up. In Group B, twenty- four pregnant females were on regular Obstetric & Gynecological follow up and ten of them even did not turned up for either. In Group B twenty-two pregnant females turned back to seek dental treatment due to pain, inflammation or inability to chew food during third trimester which were pain free earlier. In Group A, three out of five also came back for dental treatment. All the data collected was subjected to statistical analysis using paired-t test and Pearson r correlation test. **Conclusion:** Significant difference was observed with reduced pain threshold during third trimester and +1 coefficient was found stating a significant relationship between dental pulpal pain and raised levels of estrogen and progesterone during pregnancy.

Keywords: Dental Pulpal Pain, Root Canal Treatment, Estrogen and Progesterone levels during pregnancy.

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INTRODUCTION

Pregnancy is a dynamic state leading to several physiological and hormonal transient changes in the body system, including oral cavity. During pregnancy, although other hormonal changes also occur, the most significant hormonal change is the increased production of estrogens and progesterone. The production of these hormones gradually increases until the eighth month.^[1] During the last month of pregnancy, progesterone concentrations remain relatively constant, whereas estrogen levels continue to rise. The estrogen to progesterone ratio in the blood changes from 100:1 in early pregnancy to nearly 1:1 at term.^[2]

During pregnancy, in order to maintain good general and oral health the dental treatment should not be denied, withheld or delayed till it becomes an emergency to visit a dentist. Though the pregnant women who presents for dental care may require special consideration.^[3]

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MATERIALS & METHODS

Over a period of one year, around one hundred pregnant females who were in their early pregnancy, maximum upto to 10 weeks were screened for dental caries. Those who were in second or third trimester of their pregnancy were not included in this study. All the selected subjects were explained about the study and consent for the same was obtained. Out of hundred pregnant females examined seventy four were having tooth or teeth indicative of either pulpal therapy or root canal treatment (RCT). On explaining their dental status forty pregnant females with no pain or mild pain agreed to take dental treatment, they were grouped as Group A and the remaining thirty-four who were reluctant and refused dental treatment were classified in Group B. In Group A, thirty-five pregnant females got their dental treatment completed along with regular obstetric & gynecological (Obs&Gyne) follow up. In Group B, twenty- four pregnant females were on regular Obs & Gyne follow up and ten pregnant females even did not turned up for either. In Group

B twenty-two pregnant females turned back to seek dental treatment due to pain, inflammation or inability to chew food during third trimester which were pain free earlier. In Group A, three out of five also came back for dental treatment. Status of all the pregnant females was tabulated according to the time of treatment like completed prior to third trimester or completed during third trimester and intensity of pain and inflammation under mild, moderate or severe or intolerable.

Statistical analysis and Results

All the data collected was subjected to statistical analysis using paired-t test and Pearson r correlation test. P value was ≤ 0.05 . Significant difference was observed in pain and inflammation in those who received treatment during third trimester in comparison to those prior to it with maximum pain intensity during eighth month of pregnancy. Also, +1 coefficient was found between two groups stating a significant relationship between dental pulpal pain and raised levels of estrogen and progesterone during pregnancy.

RESULTS & DISCUSSION

Oral health during pregnancy has for long, been a focus of concern with obstetricians acknowledging its importance and attendant effect on pregnancy outcomes.^[4] Hormones influence oral cavity by directly affecting the oral tissues, as well as affecting a multitude of other body systems that in turn produce effects in the oral cavity.^[5] Studies,^[1,6-8] have reported significant gingival changes like inflammation, bleeding, tooth mobility associated with hormonal changes during pregnancy. Raised levels of progesterone and estrogen have been reported to increase permeability of gingival blood vessels but the exact mechanism by which these hormones increase gingival inflammation is not known. Leimola VR et al,^[9] reported that human gingival tissues contains steroid receptors and steroid hormones are metabolized by gingival homogenates suggestive of specific role in gingival physiology. At the same time the effect of these hormones on dental pulp is sparsely reported. Jelena et al,^[10] reported that dental pulp is a potential target tissue for progesterone. Estrogens increases the proliferation and desquamation of epithelial cells, which may provide a better nutritional environment for bacteria in supragingival and subgingival site.^[1] Whitkar SB et al,^[6] also reported that human pulpal tissue express estrogen and progesterone receptors. Jelena K et al,^[10] in their study showed evidence of the involvement of estrogen and progesterone in the higher sensitivity of women in several sensory modalities. In this study also significantly high sensitivity was observed during third trimester when both estrogen and progesterone were highly raised along with low pain threshold. These hormones had

their influence on sensory thresholds potentiated when both were highly concentrated.^[11] Estrogen influences the sensory neurotransmission while inducing the synthesis of neurotrophins. It also increases the release of peripheral cytokines such as gamma interferon, promoting the increase of cortisol, which can play a role in establishment of chronic pain.^[12] Estrogen function is directly influenced by the concentration of progesterone, which potentiates its analgesic effect on opioid receptors, observed in animal studies.^[13] The safest time to carry out dental treatment is during second trimester, with short appointments. Radiographs are not absolute contraindication but should be avoided during first trimester and if must, can be taken with patient wearing lead apron. Now days digital radiographs have minimal exposure.^[1,14] Studies have also reported an association between periodontal infection and preterm and low birth weight babies.^[1] Hence the dental treatment should not be avoided during pregnancy as pain free and healthy oral cavity also influences the overall general health and nutrition of pregnant female as well as of fetus.

CONCLUSION

In accordance to this study, dental pulpal pain and sensitivity were significantly affected due to raised level of estrogen and progesterone during pregnancy along with reduced pain bearing threshold, though the exact mechanism may not be clearly explained and may need further more studies to explain it in detail. To conclude, the dental treatment should not be delayed to third trimester rather should be completed by the second trimester to render a healthy pregnancy.

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