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CONCOMITANT ASSOCIATION OF PERIODONTITIS AND PREGNANCY-A SYSTEMATIC REVIEW.

Periodontics

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KEYWORDS

CLINICAL SCENARIO/ INTRODUCTION:

In 1900, William Hunter, a british physician, first developed the idea that oral microorganisms were responsible for a wide range of systemic condition and he also identified gingivitis and periodontitis as foci of infection. The focal infection theory, s proposed by hunter was based on almost no evidence. Currently, in re-examining the potential association between oral infections and systemic conditions, it is important to determine what evidence is available, and is still needed to substantiate the association and to validate the possible mechanism of association. So this evidence paper reviews current knowledge relating periodontitis to preeclampsia and pre term birth(PTB).Thus the Focused question: is "does periodontitis cause adverse pregnancy outcomes?''

BACKGROUND:

Periodontitis is an inflammatory disease affecting supportive tissues of the teeth, leading to progressive destruction of connective tissue attachment and the alveolar bone. This destruction is characterized by the formation of a periodontal pocket.

Because of its chronic inflammatory infectious nature, periodontitis has been considered a systemic exposure implicated with causative agent in variety of systemic diseases and condition. Recent findings have suggested that periodontal diseases are associated with a higher risk of cardiovascular diseases, atherosclerosis and adverse pregnancy outcomes, such as preterm birth and low birth weight.[1] and preeclampsia.[2]

Preeclampsia is a multi factorial disorder affecting approximately 10% of pregnancies and contributes significantly to maternal and perinatal morbidity and mortality.[3]It usually occurs after 20 weeks of gestations. It is characterized by abnormal vascular response to placentation, reduced organ perfusion, vasospasm, activation of coagulation system, inflammatory like response, oxidative stress, and some perturbation in volume and blood pressure control, affecting the placenta, kidney, liver, and brain. Preeclampsia is determined by maternal blood pressure elevation accompanied by proteinuria.[3]

What is Preeclampsia and pre term low birth weight baby?: Preeclampsia can be defined as blood pressure>140/90 mm of Hg on two separate occasion after 20 week of gestation and at least 1+ proteinuria.[2]

The World Health Organization definespreterm birth (PTB) as any live birth at less than 37weeks of gestation. Delivery at less than 32weeks is termed very preterm, and delivery atless than 28 weeks, as extremely preterm. Themajority of preterm births are also low birthweight. The international definition of low birthweight adopted by the Twenty-ninth World Health Assembly in 1976 is a birth weight of "less than 2500 g."[4]

Periodontal disease may increase the risk for manysystemic disorder. Biologically plausible mechanismsupport the role of periodontal infection in these condition. The focal infection theory of the early twentieth century was widely and appropriately discredited when treatment based on the theory, tooth extraction, had no effect on the underlying disease that oral sepsis supposedly caused. Similarly, the clinical utility of our current knowledge base is only now evolving. Future research will further delineate the role of periodontal infection in systemic health.

All the population groups worldwide consider birth weight as the most important determinant for the chances of a newborn infant to survive, grow and develop in a healthy way. Many studies have chosen birth weight as a key indicator for the total underlying health of the population under study. Birth weight is affected by multiple factors, and so considered as an outcome of a complex multifactorial system. Recent studies have been proved some relation between periodontal infections and pre term low birth weight babies and preeclampsia.

Search strategy:

A search of MEDLINE, the Cochrane central trials register, and web of science was conducted up to December 2018. The review and all associated searches were confined to studies published inEnglish language. The MEDLINE and Cochrane Library database and web of science weresearched from 1950 till December 2018 using the following Medical subject headings (MeSH):Preeclampsia and pre term low birth weight babies and periodontitis. A total of 104- studies Were identified addressing role of periodontitis in pre-eclampsia and pre termlow birth weight babies. The studieswere examined by2 independent reviewers (AA, VA) to select studies relevant to the specific PICO question posed in this "Best Evidence Paper.''

Inclusion criteria:

1) Types of studies included were case-controlled clinical trials.
2) Publication in peer reviewed international journals published in English
3) Studies with clearly stated objectives of the research and /or hypothesis to be tested.

Exclusion criteria:

The studies which do not full-fill the inclusion criteria, non randomized clinical trials case reports and split mouth designs were excluded.

Search out come:

A search of MEDLINE, the Cochrane central trials register, and web of science was conducted up to December 2018 and Potentially relevant publications were identified N=104. Publication excluded on the basis of title evaluation were N=101, These studies were excluded on the basis of their study design, they are non casecontrolled trials. Publications included in this "best evidence paper" N=3. These included studies fulfilled all the inclusion criteria.

DISCUSSION:

The present review attempted to evaluate any available randomized controlled human studies on the effect of maternal periodontitis on adverse pregnancy outcomes up to December 2018. The focus was on finding sufficient evidence from existing clinical studies to explore the association of maternal periodontitis and preeclampsia and preterm lowbirth weight babies. Manual andelectronic searches were conducted to explore the randomized placebo controlled human studies that evaluated the association of maternal periodontitis on pregnancy outcomes. Associations between preeclampsia, preterm low birth weight babies and periodontitis should be interpreted with discretion, because the etiology of both events is likely multifactorial.

CONCLUSION:

It is important to emphasize that primary healthcare services must be proficient to diagnose and manage periodontal disease all through pregnancy. Managing periodontal disease may represent a novel strategy to reduce the incidence and/or complications from adverse pregnancy outcomes.

Clinical bottom line:

Though the evidence regarding the association of maternal periodontitis and adverse pregnancy outcomes is not mammoth, but with the available evidence we can assume that periodontitis is associated with preeclampsia and preterm low birth weight babies.

Data extracted from 3 included studies

Reference	Patient group	Study type level of evidence	Methods	Key results	Comments
Ha JE 2011[5]	preeclampsia n=16 patients without preeclampsia post-delivery n=48	Case control studies	Full-mouth periodontal probing was conducted by one trained examiner (KHB). Localized periodontitis was defined as periodontal clinical attachment loss (AL) ≥3.5 mm on two or three sites not on the same tooth. In addition, generalized periodontitis was defined as clinical AL ≥3.5 mm on ≥4 sites not on the same tooth. Gingival crevicular fluid was collected using a sterilized paper point for quantitative analysis of Treponemadenticola, Porphyromonasgingivalis, Prevotellaintermedia (Pi), and Tannerella forsythia (previously T. forsythensis).	After adjusting for confounders, the adjusted odds ratio (OR) was 4.79 (95% confidence interval [CI]: 1.02 to 29.72) for localized periodontitis and 6.60 (95% CI: 1.25 to 41.61) for generalized periodontitis. In addition, the proportion of floss or interdental brush users in women with preeclampsia was lower than that in women without (adjusted OR: 0.21; 95% CI: 0.02 to 0.93). Pi was significantly more prevalent in women with preeclampsia (P = 0.028).	These results indicate that preeclampsia could be associated with the maternal periodontal condition and interdental cleaning.
Siqueira FM et al 2008[6]	1,206 Brazilian women were included and divided into a control group (1,042 non-preeclamptic women who gave birth to infants with adequate gestational age and birth weight) and a case group (164 preeclamptic women).	Case control study	125 preeclamptic women were matched according to age, chronic hypertension, and primiparity to 375 non-preeclamptic women randomly selected from the control group. Maternal periodontitis was defined as PD > or =4 mm and CAL > or =3 mm at the same site in at least four teeth.	After controlling for confounders, maternal periodontitis was included in the multivariate final model (odds ratio [OR] = 1.94; 95% confidence interval [CI]: 1.37 to 2.77; P<0.001) and remained associated with preeclampsia after matching (OR = 1.52; 95% CI: 1.01 to 2.29; P = 0.045). The odds of preeclampsia were associated with an increase in the number of sites with BOP and PD and CAL > or =4 mm.	Maternal periodontitis is a risk factor associated with preeclampsia, emphasizing the importance of periodontal care in prenatal programs
G. Jaiman.[7]	Thirty pregnant women distributed equally in the case (preeclampsia) and control (healthy) group.	Case Control study	Gingival index, plaque index, bleeding on probing, clinical probing depth, and clinical attachment level were measured in both groups. Microbiologic examination for identification of one red complex organism Porphyromonasgingivalis and one orange complex organism Fusobacteriumnucleatum were done in plaque and placental blood of cases and controls. The clinical examinations and collection of placental blood were done 24 h before delivery	Periodontal condition in the preeclamptic women was statistically worse compared with the normotensive women. There was no statistically significant association between microorganisms in plaque and placental blood between normotensive control and preeclamptic pregnant women. The preeclamptic women had significantly higher chances of having newborns weighing <2.5 kg than the normotensive women	The preeclamptic women were associated with significantly higher periodontitis and lower fetal birth weight than normotensive women.

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