



Research Paper

## Assessment of Anaemic Stomatitis and Pregnancy Gingivitis across three trimesters: A cross-sectional study

RAMYA PULLURU , N. KANNAN, RAKESH KUMAR MANNE, B. SWAPNA SREEDEVI, P. VENKATA SARATH, TVK CHAITANYA

### ABSTRACT

#### Background:

Anaemia is one of the most frequently observed features in pregnant women in India, often characterized by the presence of anaemic stomatitis. Pregnancy is a particularly vulnerable period occurring in the life of a woman wherein, good oral health and good oral hygiene practices are of paramount importance. The study was intended to assess whether Pregnant women need any additional iron supplementation and whether there is a need for oral prophylaxis and improving oral hygiene practices in this population.

#### Method:

A cross-sectional study using a questionnaire was conducted for the assessment of anaemic stomatitis and gingivitis in pregnant women across three trimesters, reporting for antenatal checkup to the Gynaecology and Obstetrics Department. Informed consent was taken followed by intra-oral and extra-oral examinations for sixty pregnant women during the period from November 1, 2022, to December 31, 2022. Data collected was subjected to statistical analysis using SPSS version 20 and Fisher's exact test.

#### Results:

Pregnancy Gingivitis was observed [ $P < 0.446$ ] with a prevalence of 55% in the 1<sup>st</sup> trimester; 45% in the 2<sup>nd</sup> trimester and 35% in the 3<sup>rd</sup> trimester in pregnant women. Anaemic stomatitis [ $p = 0.005$ ] was observed with a prevalence of 75% in the 1<sup>st</sup> trimester 80% in the 2<sup>nd</sup> trimester 35% in the 3<sup>rd</sup> trimester.

**Conclusion:** Our study showed anaemic stomatitis was more common in pregnant women in the first and second trimesters due to various factors like lack of adequate iron intake during pregnancy, lack of appetite, pregnancy-induced nausea and lack of knowledge of appropriate foods. Our study showed that there is a need for improving and maintaining oral hygiene starting from the first trimester of pregnancy for improved maternal and better pregnancy outcomes.

**Keywords:** Anaemic stomatitis, pregnancy gingivitis, gingivitis, anaemia, oral health, trimesters.

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### I. INTRODUCTION

Gingivitis refers to an inflammatory condition of the gingiva, most commonly initiated by oral bacteria, progressing from plaque formation and gingivitis to calculus formation, inflammation, and destruction of periodontal ligament fibers eventually resulting in tooth loss (1). Pregnancy is a particularly susceptible period in a woman's life in which good oral health and good oral hygiene practices are of paramount importance. The oral health status of pregnant women in India is not well documented. Pregnancy affects every aspect of a woman's life including her oral health. Hormonal changes during pregnancy like elevated estrogen and progesterone levels make them more susceptible to oral infections and periodontal diseases (2). These dental problems can affect the health of expectant mothers and in turn, has the potential to affect the health of the unborn foetus (3). Anaemia is one of the most frequently observed features in pregnancy in India (4). One of the most common oral manifestations of anaemia is anaemic stomatitis. It is most commonly observed as a result of combination of various factors. Literature regarding anaemic status across the three trimesters is sparse in our country making this an important area where investigation and research needs to be carried out.

## II. MATERIALS AND METHODS

A cross sectional study using questionnaire was conducted for the assessment of anaemic stomatitis and gingivitis in pregnant women across three trimesters, came for checkup at Narayana medical hospital, Nellore. Intra oral and extra oral examination was done on sixty pregnant women during the period from November 1,2022, to December 31,2022.

### Inclusion Criteria

- Pregnant women, willing to participate in the study

### Exclusion Criteria

- High risk pregnancy patients
- patients with immune mediated diseases
- patient on medication like steroids, antihypertensives, immunomodulators

Pregnant ladies coming to the Department of Gynaecology for antenatal check were given details of the study proposed to be undertaken, and procedures therein including the voluntary nature of their participation. Twenty pregnant women from each of the three trimesters of pregnancy willing to give informed consent leading to a total sample size of 60 patients were recruited for the study. A clinical case form was filled out for each patient including details of socioeconomic background appetite, type of diet, intake of nutritional supplements, and oral hygiene practices.

A thorough examination of the oral cavity including assessment for presence or absence and severity of anaemic stomatitis and pregnancy gingivitis and periodontal health assessment was done using a color-coded Williams probe (Hu-Friedy, Chicago, IL, USA). Pocket Depth was measured on six sites per tooth (disto-, mid- and mesial- aspects of buccal and lingual surfaces) and the CEJ-GM distance on two sites per tooth (mid-buccal and lingual aspects) of first and second molars was recorded along with photographic documentation of the same. Sampling Blood: 5ml of blood was drawn from the antecubital vein by lab technicians and subjected to analysis for Complete Blood Picture, Hb% and TIBC levels. Estimations of TIBC were carried out by Fully Automated Analyzer (Biosystem Company) using TIBC kits

## III. Results:

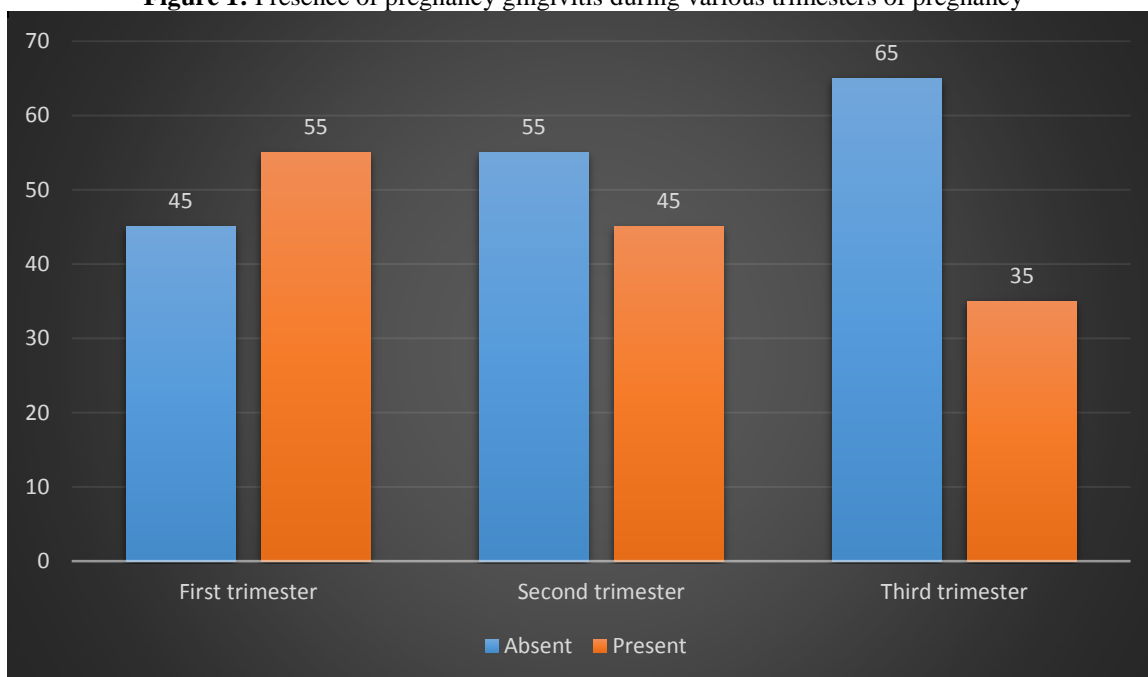
Based on findings of the study there was a high prevalence of pregnancy gingivitis [ $P < 0.446$ ] and anaemic stomatitis [ $p = 0.005$ ] in pregnant women.

**Table 1:** comparison of pregnancy gingivitis among study subjects of various trimesters of pregnancy

| Pregnancy gingivitis |                 |                  |                 |                                  |
|----------------------|-----------------|------------------|-----------------|----------------------------------|
|                      | First trimester | Second trimester | Third trimester | Chisquare test                   |
| Absent               | 9(45)           | 11(55.0)         | 13(65.0)        | $\chi^2$ value: 1.616<br>p=0.446 |
| Present              | 11(55)          | 9(45.0)          | 7(35.0)         |                                  |

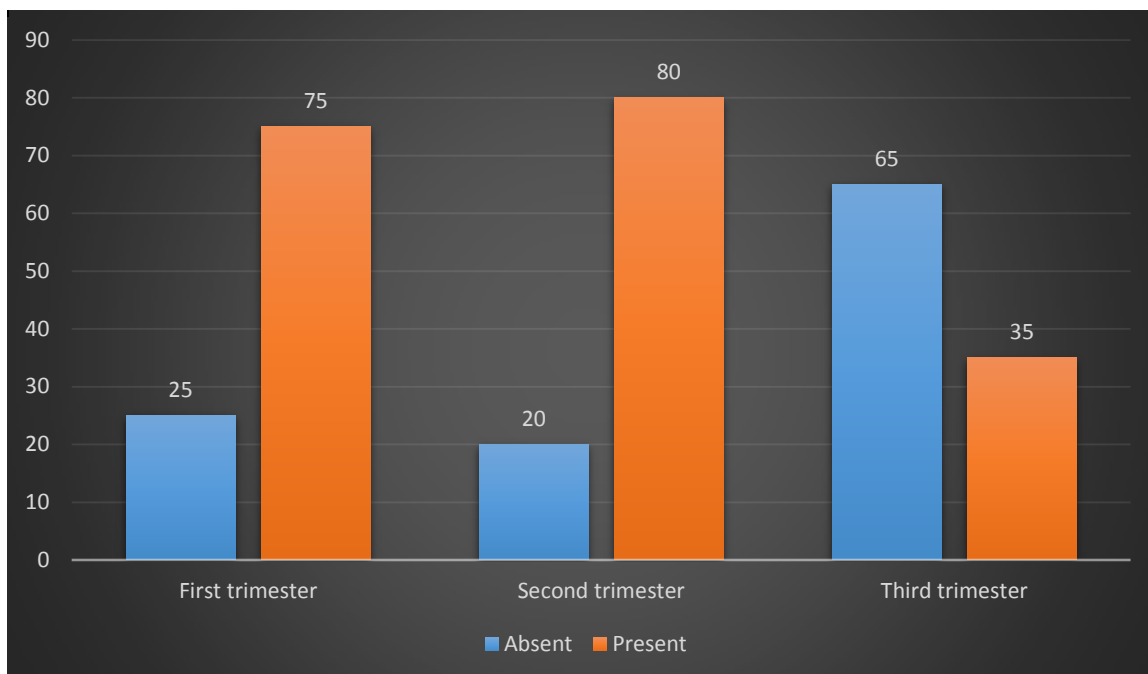
$P < 0.05$ \* significant

**Figure 1:** Presence of pregnancy gingivitis during various trimesters of pregnancy



**Table 2:** comparison of Anemic stomatitis among study subjects of various trimesters of pregnancy

| Anemic stomatitis |                 |                  |                 |                                    |
|-------------------|-----------------|------------------|-----------------|------------------------------------|
|                   | First trimester | Second trimester | Third trimester | Chisquare test                     |
| Absent            | 5(25.0)         | 4(20.0)          | 13(65.0)        | $\chi^2$ value: 10.478<br>p=0.005* |
| Present           | 15(75.0)        | 16(80.0)         | 7(35.0)         |                                    |



**Figure 2:** Presence of anemic stomatitis among study subjects of various trimesters of pregnancy

#### IV. Discussion:

Pregnancy is a particularly vulnerable period in the life of a woman in which good oral health and good oral hygiene practices are of paramount importance. Poor periodontal health has been implicated in few studies as a potential cause of adverse pregnancy outcomes. Dental problems can affect the health of expectant mothers

and in turn has the potential to affect the health of the unborn foetus. Anaemia is also one of the most frequently observed features in pregnancy. One of the most common oral manifestations of anaemia is anaemic stomatitis. Nivesh Krishna et al. (5) conducted a study on anemic stomatitis in patients with anemia. Their findings suggest that both anemia and anemic stomatitis were predominantly observed in patients between the ages of 36 to 50 years. The study estimated that 27.7% of the 47 patients with anemia had anemic stomatitis.

In our study iron deficiency anemia was found to be more common in the 1<sup>st</sup> and 2<sup>nd</sup> trimester of pregnancy compared to the 3<sup>rd</sup> trimester. This result is similar to the finding reported in the study done by Tandon R et al. (4) Their study concluded that the prevalence of iron deficiency in pregnant Indian women is alarmingly high at around 50%, making it one of the highest rates in the world. EL Ashriy et al. (6) in their study on 384 pregnant women in their third trimester investigated the prevalence and risk factors of anemia. They utilized a structured questionnaire and assessed hemoglobin levels as objective indicators of anemia. In another study done by Deepak Sharma et al. (7) reported the prevalence of anemia in 17.9% of pregnant women in Nepal.

The severe consequences of untreated iron deficiency, including increased risks of maternal and perinatal mortality, preterm delivery, low birth weight, infections, cognitive impairment, and even schizophrenia. Low socioeconomic status, low education level, multiparity, and poor dietary intake of iron and folic acid, malabsorption syndromes, and parasitic infestations like hook worm and tape worm are the main risk factors for anemia.

karunachandra NN et al. (8) in their study found that rural antenatal women had a significantly higher prevalence of decayed and filled teeth, as well as untreated dental caries, compared to their urban counterparts. This highlights the need for improved dental care and awareness among rural communities. Wenqi Hu et al. (9) in their study discovered that 24% of the women were unaware of the importance of oral health during pregnancy, and 32% reported deterioration of their oral health after pregnancy. The authors concluded that pregnant women have insufficient knowledge and awareness regarding the impact of oral health on pregnancy and fetal development. They suggested that gynecologists should provide more education and dental referrals to their patients. Additionally, self-assessment of oral health could serve as a useful tool to motivate women to improve their oral hygiene and seek dental care.

In our study pregnancy gingivitis is more prevalent in 1<sup>st</sup> trimester which is 55% and in the second trimester which is 45% these results are in accordance to the study conducted by Mills LW et al. (1) that highlighted the potential link between periodontal disease in pregnant women, Renata et al. (3) in their study they compared the subgingival flora and serum levels of estradiol and progesterone in different gestational trimesters and non-pregnant women. They found that gestation was correlated with the total bacterial count. Bacterial count was more prevalent in the first trimester and associated with gingivitis, while progesterone levels in the first trimester enhanced the progression of gingivitis into periodontitis.

Marina et al. (10) found that the frequency of PD (periodontal disease) was 63%, with 18% of cases classified as severe PD (SPD). Pregnant women with SPD had a higher likelihood of experiencing vulvovaginitis and premature rupture of membranes. Additionally, newborns of mothers with SPD had a higher chance of fetal growth restriction. These findings highlight the negative outcomes associated with PD, particularly SPD, for both the mother and baby. Therefore, it is crucial to prioritize oral health in prenatal care. Charlotte Thomas et al. (11) conducted a study among 121 pregnant women, in which only 12 of them underwent periodontal assessment in the first trimester, even in the absence of external clinical signs this approach helps prevent the aggravation of periodontal disease and potential complications. In another study by Karen Raju et al. (12) it was explained how hormonal changes during pregnancy can impact gingival tissues, making them more susceptible to plaque accumulation and gingivitis.

To ensure optimal oral health during pregnancy, patients should consider scheduling elective dental treatments during the second trimester. Education on oral health during pregnancy should emphasize the importance of proper nutrition, including the intake of prenatal vitamins and foods rich in protein, calcium, phosphorus, and vitamins A, C, and D. It is worth noting that there is a lack of literature regarding the improvement of anemic status across the three trimesters due to prenatal vitamin supplementation in our country. This highlights the need for further investigation and research in this area. Additionally, there is limited documentation on the oral health status of pregnant women in India.

VamosCA et al. (13) demonstrated that using oral instruction and audiovisual presentations, both individually and in group settings, can significantly improve the knowledge, beliefs, attitudes, self-efficacy in oral hygiene, and health-seeking behaviors of pregnant women. Therapy for iron deficiency (IDA) includes dietary modifications, oral iron supplementation, intravenous iron, and blood transfusion. Newer parenteral iron preparations have been deemed safe and show promising evidence for use in frontline settings during the second and third trimesters of pregnancy.

As a result healthcare providers, including nurses, are now paying more attention to oral health during pregnancy to establish a healthy oral environment which is crucial for pregnant patients. To address this health issue, we recommend increasing public awareness and implementing initiatives such as the observance of a "National Anemia Awareness and Treatment Day." By prioritizing oral health and addressing anemia, we can improve the overall well-being of pregnant women in our country.

## V. Conclusion:

Our study showed anaemic stomatitis was more common in pregnant women in the first and second trimesters compared to the third trimester. Lack of adequate iron intake during pregnancy, lack of appetite, pregnancy-induced nausea and lack of knowledge of appropriate foods during pregnancy are (5) consider risk indicators in pregnant women. Iron supplementation provided may be considered as the cause for improvement of hematinic status in the third trimester. This is suggestive that parenteral iron supplementation should be preferred over oral supplementation who are unable to take orally due to gastric irritation and constipation, and also there is a need for improving and maintaining oral hygiene starting from the first trimester of pregnancy for better maternal and fetal health.

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