Could the Severity of Infected Gingiva in Pregnant Woman Affect the Quality of Life?

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ABSTRACT

Background: Observation carried out in early 2016 to a number of pregnant women in Community Health Center Surabaya found that more than 80% of pregnant women had infected gingiva or gingivitis. Pregnant women are susceptible to oral and dental disease. Oral health problem could impact on oral health-related quality of life, includes physical pain, physical disability, psychological discomfort, functional limitation, and social disability.

Objective: The aim of this study was to analyze the influence of severity level of infected gingiva on oral health-related quality of life of pregnant woman.

Method: A cross-sectional study was conducted in 10 Community Health Centers Surabaya and involved 106 pregnant women. All of participants were examined regarding their severity level of infected gingiva, also answered the quality of life questionnaire.

Result: Lower quality life of pregnant woman were observed in woman presenting more severe infected gingiva level.

Conclusion: Oral health-related quality of life of pregnant woman were influenced by the severity level of infected gingiva.

Keywords: gingivitis, pregnancy, woman, quality of life

Introduction

Pregnant women have higher prevalence of gingivitis than non-pregnant women1. Pregnancy gingivitis affects 25-100% of pregnant women and occurs during 2nd to 8th month of pregnancy2. Indonesian Dental Association has recorded prevalence of pregnancy gingivitis 75-90% worldwide, meanwhile in Indonesia it is up to 5-10%3,4. In early 2016, initial survey upon pregnant women conducted at Community Health Center Surabaya found that more than 80% pregnant women had gingivitis. During pregnancy, progesteron level in body could be 10 fold higher than normal level. This kind of condition potentially increases certain pathogenic bacteria growth that lead to gingivitis5.

There are several factors which could influence susceptibility of pregnant woman to gingivitis, such as gestational age, nutritional status and the presence of systemic disease i.e diabetes mellitus. Gestational age is associated with susceptibility of pregnancy gingivitis because of hormonal change such as an increase of estrogen and progesterone as gestational age increases6. Poor nutritional status of pregnant woman could decrease immunity against various diseases, particularly infectious disease. Malnutrition or poor nutritional status has synergistic relationship with infection, which means malnutrition deteriorates infectious disease, and infection deteriorates malnutrition7. Any changes in immune system and estrogen and progesterone level in 40% of pregnant women lead to gingivitis during pregnancy5,8,9.

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Chronically and untreated pregnancy gingivitis could increase risk of premature birth and low birth weight (LBW)\(^\text{(10)}\). This is emphasized by National Health Survey 2002 which showed that 77\% of pregnant women with gingivitis have preterm labor. In addition, in a study reported by Retroningrum 2006 carried out in Kariadi Hospital Semarang showed that pregnancy gingivitis had risk factor of low birth weight (LBW) as 8,75 times higher than those without gingivitis\(^\text{(11)}\).

Gingivitis as oral health problem frequently occurs during pregnancy could impact on individual well-being such as physical pain, physical limitation and psychological discomfort. Impact of oral health condition on quality of life is evaluated and defined as Oral Health-Related Quality of Life (OHRQoL). United States Surgeon General’s report defined oral health-related quality of life as a multidimensional concept that describe oral health-related comfort during eating, sleeping and involving in social interaction. Acharya et al stated that periodontal disease in pregnant woman lead to poor oral health-related quality of life\(^\text{(12)}\).

According to previous study, it has been found impact of gingivitis during pregnancy on oral health-related quality of life, but the lack of available data about that in Indonesia is the underlying reason to investigate correlation between severity level of pregnancy gingivitis and oral health-related quality of life of pregnant woman.

### Material and Method

This study was analytical observational quantitative study with cross sectional study design, aiming to investigate correlation between risk factors and effect. The samples were chosen using cluster random sampling method, resulting of 106 pregnant women as respondents in 10 Community Health Center Surabaya. All the procedures in this study were conducted according to the approval of Ethical Commission.

This study had inclusion and exclusion criteria. Inclusion criteria included: (1) pregnant woman without dental calculus; (2) never have gingivitis before pregnancy; (3) without systematic disease, such as diabetes mellitus; (4) pregnant woman on early first trimester, late first trimester, early second trimester, late second trimester, early third trimester, and late third trimester; (5) regularly consuming high-fiber containing food (vegetables and fruits). Exclusion criteria of study included: (1) pregnant woman with dental calculus; (2) with history of gingivitis before pregnancy. (3) with systemic disease, i.e diabetes mellitus. (4) irregular high-fiber containing food (vegetables and fruits) consumption.

This study employed questionnaire form as instrument to know respondents data and Oral Health Impact Profile (OHIP-14). Also, gingival index form to assess severity level of gingivitis. Oral Health Impact Profile (OHIP-14) questionnaire form have been modified specifically to know level of oral health-related quality of life of pregnant woman. Before questionnaire modification, translation of instrument had been done first. After translating instrument of oral health-related quality of life of pregnant woman, researcher did validity and reliability test. During validity and reliability test, questionnaire instrument was distributed with cluster random sampling to pregnant women in Maternal and Child Health (MCH) Clinic, Community Health Center Surabaya.

Questions in questionnaire of oral health-quality of life consisted of 7 dimensions, as follows: 1. Dimension of functional limitation; 2. Dimension of physical pain; 3. Psychological discomfort; 4. Physical disability; 5. Psychological disability; 6. Social disability; 7. Handicap. In that questionnaire, respondent would be asked how frequent they had gum impairment during pregnancy using Likert scale. The choices of answer of questions in oral health-related quality of life of pregnant woman questionnaire were “very often”, “fairly often”, “sometimes”, and “never” with score as 1, 2, 3, and 4, respectively. The higher the score, the better the quality of life.

Selected pregnant women were given informed consent as their approval to participate as study sample. After that, intraoral examination was done using periodontal probe and mouth mirror to see the severity level of gingivitis in respondents, and recorded on gingival index. This study received ethical approval from Ethics Committee Faculty of Dentistry Airlangga University. For analysis, distribution table was used with percentage as confirmation. Present study employed correlation test to analyze correlation between pregnancy gingivitis and oral health-related quality of life of pregnant woman.

### RESULT

In this study, characteristics of pregnant women in Community Health Center Surabaya had been known, such as: age, level of education, employment status, monthly income, gestational age and maternal mid-
upper arm circumference (MUAC). In terms of age, mean age of pregnant woman was 28 years, most of them aged 24-32 years (59.5%). Majority of respondents had ever attended level of education minimum Senior High School (67.9%). Most of them (68.9%) were unemployed. Monthly income of respondents was under five million rupiahs (97.2%). Most respondents examined in Community Health Center belonged to low and moderate economic class, and 50.9% had third trimester of gestational age with mean age approximately 24 years. Majority of MUAC were 23.5 cm (88.7% of total respondents), and mean MUAC was 28 cm. It showed that most pregnant women in Community Health Surabaya had good nutritional status.

Oral hygiene level of pregnant women (68.9% of total respondents) was classified as moderate with mean score by 2.4. Also, 47.2% of total respondents had moderate severity level of gingivitis, and mean score of gingival index was 1.3. Moderate level of gingivitis possibly could decrease oral health-related quality of life of pregnant woman, thus results in low OHIP-14 score.

| Table 1: Value of correlation coefficient and significance level of pregnancy gingivitis on each item of Oral Health Impact Profile-14 |
|-----------------|-----------------|-----------------|-----------------|
| **Dimension**   | **Item**         | **Correlation coefficient (r)** | **Significance level (p)** |
| Functional limitation | Difficulty in pronouncing any words | - 0.047 | 0.631 |
|                  | Sense of taste impairment | - 0.226* | 0.020 |
| Physical pain    | Painful aching on gum | - 0.187 | 0.055 |
|                  | uncomfortable to eat any foods | - 0.134 | 0.171 |
| Psychological discomfort | Feeling self conscious | - 0.175 | 0.073 |
|                  | Feeling tense | - 0.082 | 0.405 |
| Physical disability | Unsatisfactory diet | - 0.199* | 0.041 |
|                  | Interrupted meal | - 0.283* | 0.003 |
| Psychological disability | Difficult to relax | - 0.253* | 0.009 |
|                  | A bit embarrassed | - 0.078 | 0.428 |
| Social disability | Difficulty in doing usual jobs | - 0.197* | 0.043 |
| Handicap         | Totally unable to function | - 0.167 | 0.086 |

Table 2 shows that there is correlation between severity level of pregnancy gingivitis and oral health-related quality of life of pregnant woman particularly in dimension of functional limitation, physical disability, psychological disability, and social disability.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Correlation coefficient (r)</th>
<th>Significance level (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of life score (OHIP-14)</td>
<td>- 0.327*</td>
<td>0.001</td>
</tr>
</tbody>
</table>

As presented on study result, the severity level of pregnancy gingivitis in Surabaya according to Loe & Silness gingival index was moderate, and oral hygiene status was classified as moderate. On third trimester of pregnancy, estrogen and progesterone level increases, thus vascularization and blood vessel permeability of gingiva is also increased\(^\text{13}\). The presence of debris and calculus is overresponded by gingiva that leads to gingival inflammation, redness and easily bleeding. It shows that hormonal factor could worsen plaque bacteria as local factor\(^\text{14}\).

Pregnancy gingivitis is one of oral diseases that frequently affects pregnant woman particularly on 2\(^\text{nd}\) to 8\(^\text{th}\) month of pregnancy\(^\text{2}\). This is confirmed by present study result that demonstrated 54 of 106 pregnant woman had gingivitis on third trimester of pregnancy. Pregnancy
gingivitis could present some clinical manifestations which may influence daily activities and quality of life. One of instruments used to assess oral health-related quality of life is Oral Health Impact Profile 14 (OHIP – 14). OHIP – 14 is a multidimensional concept which describes comfort during eating, sleeping, and socially interacting. According to the present study result, mean score of oral health-related quality of life of pregnant woman in Community Health Center Surabaya was fairly good.

The presence of oral health impairment may impact significantly on physical, psychological and social well-being, thus influences quality of life. Impairment in oral cavity such as periodontal disease e.g life-threatening impairment on gingiva may contribute to preterm birth and low birth weight, influence respiratory disease, gastrointestinal, stress and decrease immune system against infection. The presence of gingival problems may lead to stress, therefore it could make patient afraid, anxious, having painful aching and discomfort. If it is untreated, quality of life will be influenced.

In this study, the severity level of pregnancy gingivitis had influence on quality of life particularly in dimension of functional limitation, physical disability, psychological disability, dan social disability. Dimension of functional limitation includes sense of taste impairment, thus appetite is decreased. Decreased appetite will influence intake of vitamin A and fiber which is highly required by pregnant women, particularly fruits and vegetables, consequently in addition to promote gastrointestinal disorder, of course it will impact on comprehensively maternal and fetal health.

Dimension of physical disability includes discomfort in eating any foods, which means the higher the severity level of pregnancy gingivitis, the more uncomfortable in eating any foods, and vice versa. Beside physical disability, severity level of pregnancy gingivitis also impact on meal process, which could lead to interrupted meals. It shows that the higher the severity level of pregnancy gingivitis, the more frequent they have interrupted meals. Impairment in dimension of functional limitation and physical disability is caused by clinical manifestation of pregnancy gingivitis such as gingival enlargement on papilla of one or two teeth that may interfere mastication. It is crucial for pregnant woman to maintain oral health in order to masticatory function keep maintained, thus nutrition intake, dental and overall health of pregnant woman are maintained in good condition.

Dimension of psychological disability includes being difficult to relax, which means the higher the severity level of pregnancy gingivitis, the more difficult pregnant woman relaxed. Bleeding gingiva is one of discomfort that commonly occur during pregnancy. This condition is normal and not life-threatening, but for most of pregnant women it may cause anxiety so that they are difficult to relax. Gingival enlargement particularly in anterior region as clinical manifestation of gingivitis may also impact on psychological aspect. Gingival problems will impact on communication process because oral structure is the important part of verbal and non-verbal communication, hence it may influence self image and ability to survive and build social relation.

Dimension of social disability includes difficulty to do usual jobs, which means the higher the severity level of pregnancy gingivitis, the more difficult pregnant woman to do usual jobs. Gingival problems may cause pain and discomfort during activities, thus it could decrease work productivity. The severity level of pregnancy gingivitis has significant correlation with oral health-related quality of life of pregnant woman. Therefore, if the severity level of pregnancy gingivitis is high, oral health-related quality of life of pregnant woman will be low, and vice versa.

Conclusion

Based on study result and discussion, it has been known that there is negative correlation between the severity level of pregnancy gingivitis and oral health-related quality of life of pregnant woman, which means the higher the severity level of gingivitis, the lower the quality of life and vice versa.

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Ethical Clearance: All the procedures in this study were conducted according to the approval of Ethical Commission.
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