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The Prevalence and Risk Factors of Periodontal Disease and Dental Caries among Pregnant Women at Bolikhamxay Province, Lao PDR

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ABSTRACT

Objectives: *To evaluate the prevalence of periodontal disease among pregnant women and its association with socio-demographic factors, knowledge and oral hygiene.*

Methods: *This cross-sectional was conducted among pregnant women at the health center in Pakkading and Paksun district at Bolikhamxay province. A total of 221 pregnant women was recruit for a full-mouth dental examination after providing informed consent. Pregnant women divided in group with and without Pocket depth (PD), Decay, Missing, Filled Teeth (DMFT), PUFA, Bleeding gum on probing and pocket depth according to standard from (WHO, 2013) were evaluated at one clinical oral examination below 36 weeks of gestation. Independence variables were age, ethnic, religion, education, occupation, income, parity, gestation age, smoking, alcohol, betel habit, oral health experiences, visited dentist. Statistically analyses provided prevalence ratio and their respective 95% CI and also multivariate analysis.*

Results: *Pregnant women reported that their teeth and gum was fair 43%, 77% they didn't want to go to dentist because they believe that no matter what they did with the tooth it still has problem with teeth and gum. Prevalence of untreated dental caries was 56%, Bleeding was 53% and pocket depth more than 3mm was 49%. Pregnant with morning sickness reported risk periodontal disease 1.64 times than non-morning sickness, with statistically significant (PR 1.67; 1.21-2.31). Pregnant women who live in Pakkading district had periodontal disease 1.49 times then who live in Paksun District and shown the statistically significant (p=0.003). the prevalence of periodontal disease was increase with gestational and its shown that bleeding on probing was strongly associated to periodontal disease p<0.0001.*

Conclusion: *The prevalence of Periodontal Disease is high associated with gingival bleeding on probing, more advance gestational age and morning sickness. Oral health care program should be included in prenatal care early pregnancy. Especially for low education, income and dental visit, low knowledge population.*

Keywords

Periodontal disease, Prevalence, Risk factors, Pregnant women.

Introduction

Bolikhamxay is a once province of Laos, located in the middle of the country. Bolikhamxay province consist of 6 districts and have 50.140 population with difference area and most area is upload [1]. Unmet the health care service still be a public health problem in communities' levels. Most of maternal have low education for the health check-up and health education, children still have high prevalence of malnutrition status [2].

It has been reported that dental caries and periodontal diseases increase during pregnancy. There is even a periodontal condition known as "gestational gingivitis" and "pregnancy epulis" for local inflammatory processes in the gingiva and inter dental papillae.

There is an old adage that says "each child cost you a tooth" meaning that it was expected a mother will lose one teeth as a consequence of pregnancy [3].

During pregnancy due to hormonal factors (high estrogen and progesterone) women are more vulnerable to periodontal disease than their non-pregnant peer [4]. Pregnant women with periodontal disease are more susceptible to poor maternal and perinatal outcomes such as preeclampsia [5], gestational diabetes [6]. Vulvoraginitis, peterm labour, fonetal growth restriction [7], low birth weight and perinatal mortality [8]. Periodontal disease is a common oral infection with prevalence ranging from 10-60%, and refers to gingivitis and periodontitis [9]. Gingivitis is an inflammatory condition of the soft tissues surrounding the teeth and periodontitis involves localized increases in the numbers and tissue invasion of anaerobic Gram-negative bacteria, causing persistent inflammation and destruction of the supporting structures of the teeth, such as the periodontal ligament and alveolar bone, resulting in mobility and occasional teeth loss [10]. Depending on diagnostic criteria. Risk factors include the increasing age, male gender, some ethnicities, low educational level, poor economic status, tobacco use, psychological distress, and poor oral hygiene might effect to oral health condition and toothless [11-13]. The increased gestational age was also a risk factor.

Periodontal disease is associated with systemic diseases such as cardiovascular diseases and diabetes [14], as well as various adverse pregnancy outcomes including preterm birth, low birth weight, early pregnancy loss, gestational diabetes mellitus and preeclampsia [15]. Among pregnant women, the prevalence of periodontal disease is also high, ranging from 10 to 74% [16]. Due to the high prevalence of periodontal disease and its association with systemic disease, much more attention has been attracted from both the medical and public health areas, in order to improve the health of the whole population.

Most of previous studies have been focusing on studying the prevalence of periodontal disease during the time period of pregnancy and its impact on pregnancy outcomes. It is well known that pregnancy itself increases the prevalence of gingivitis and periodontitis [17]. However, little is known about the prevalence and risk factors among pre-conception women who plan to conceive. In addition, given the fact that several large clinic trials demonstrated the treatment for periodontal disease during pregnancy was ineffective in improving pregnancy outcomes [18] and treating periodontal disease during pregnancy potentially leads to an increase in bacteremia, which itself may increase the risk of adverse pregnancy outcomes, it has been put forward that the pre-conception period may be a more optimal time for the treatment of periodontal disease [19]. It is important to understand the prevalence and risk factors of periodontal disease among women during pre-conception period. The study aims to investigate the prevalence and severity of periodontal disease and the risk factors among pregnant women in the middle of Laos (Borlikhamxay province) and assessment the association of pregnancy's knowledge, habit and dental visited and periodontal disease.

Design and Methodology

This study was a cross-sectional study conducted at two mains local public hospitals was selected from Paksun district and Pakkading district which is center hospital in Bolikhamxay province. Pregnant women were invited to participant during their antenatal care in hospital and community health center for their first time were approached to be enrolled in the study. This study evaluates the result of a dental caries, gum bleeding and periodontal disease.

Study Population

Pregnant women who is resident in Paksun district and Pakkading district. A convenient sample of 221 pregnant women was invited to participant. The interview and oral clinical examination were conduct on the day of a schedule prenatal visited during survey period. Pregnant women who volunteer agreed to participate in the study were sign an informed consent form. The study was approved by the Institutional Review Board. Pregnant women who volunteer to participant and who visited the prenatal check-up at that time. Pregnant women with risk and have severe systematic disease, pregnant women who more than 32 weeks of pregnant, or if they had a current multiple pregnancy were excluded.

Data Collection

Pregnant women were asked for their socio-demographic variable (age, ethnic, education, marital status, and systemic disease), medical and obstratric history such as: systematic health disease, number of pregnant, number of children, condition of morning sickness was asked by two interviewers; then women were asked specifically about dental knowledge, oral hygiene, dental visited and dental health problem during the pregnancy, habit variable (smoking, alcohol). gestational age at examination (weeks) and the self–report of oral variable (caries and periodontal disease). Utilization of dental service by face to face interview about 10 minutes.

The clinical of oral examination was provide after prenatal care at the maternity health care center of the Pakkading district and Paksan district. Subjects were invited to sit on the dental chair with clear light used at dental clinic department by two dentists and community health center at Bolikhamxay province.

Dental Caries Examination

Dental caries was measured at the cavitated level using the WHO Oral Health Survey Basic Methods (5th edition, 2013) [20]. Each permanent teeth were coded as sound, decayed, missing or filled due to caries. The DMF Index was calculated for each person corresponding to summation of decayed, missing and filled teeth. A person with the caries will be defined as having one or more decayed, missing and filled teeth (DMFT>0). A flat mouth mirror and Explorer was used by examiner to removed debris and diagnose the dental caries experience following DMFT index (Dental caries, Missing, Filling) and PUFA index (Pulpitis, Ulceration, Fistula, Abscess) modified from WHO, 2013.

Periodontal Examination

The tool was used a clinical oral examination: plane mouth mirrors; metallic periodontal probes (Community Periodontal Index (CPI) probe) that conform to WHO specifications, i.e. 0.5 mm ball tip; a black band between 3.5 and 5.5 mm and rings at 8.5 and 11.5 mm from the ball tip; and several pairs of tweezers. The data was recorded on a clinical record form with a complete clinical and periodontal description of all the teeth including third molars. Probing pocket depth (PPD: measurement from the gingival margin to the total probing depth) the six site of tooth was exam the depth with high score was recorded in the WHO form 2013 [20]. Two indicators of periodontal status are used for this assessment was: gingival bleeding and periodontal pockets. The pocket depth (the deepest measurement) was identified for each assessed. Pregnant women were diagnosed as having healthy gingiva if no pocketing and no bleeding on probing were noted. We used the minimum criteria for periodontal disease in the current study as follows: "bleeding on probing and pocket depth" the moderate and severe forms of periodontal disease were defined as the presence 4 or more sites with a pocket depth 4-5 mm or more sites with pocket depth ≥ 6 mm, respectively.

Statistical Analysis

All data was entering to excel computer database. Prevalence of periodontal disease was present as percentage, multiple logistic regression analysis was carried out of periodontal disease as the outcome and all others as independent variable. The level of significance was establishing at 5% SPSS program was used for the statistical analysis procedures.

Results

A total of 221 pregnant women were included in the study. Pregnant women in Pasun district was 48% and in Pakkading was 52%, mean age was 26 ±5, minimum was 15-year-old and maximum was 41-year-old. 91.4% is Laolum, Half of pregnant women was completed secondary and high school. 35% of women is housewife and farmer, pregnant women theirs monthly income was 1.000.000 to 3.000.000 Lak (45-120 US Dollars).

Ninety-seven percent of women clean their mouth by tooth-brushing with fluoride toothpaste only 3 people said that they clean their mouth by rinse water. 67% of pregnant women who had morning sickness shown that they had problem with periodontal disease (p=0.001). Pregnant women who had morning sickness shown they had 1.64 times with periodontal disease to women with non-morning sickness. Twenty-four percent of them had experience with pain in oral during pregnant periods, 67% reported that they had gum bleeding during they brushing teeth, 76% notice that they had gum became red and swallow during pregnant periods. Only 33% of them visited the dentist with their pain and 67% never visited dentist in their entire life half of them reported that they never have problem with their mouth or teeth, and 15 person said that they scare of dentist and instrument, 10 person said that they don't know who is dentist.

Table 2 shown the knowledge of pregnant women about their oral health condition, pregnant women reported that their teeth and gum was fair 43%,31% report their teeth and gum was very good and their teeth and gum was poor 14%. 76% of them reported that the teeth are very importance for them, 77% they didn't want to go to dentist because they believe that no matter what they did with the tooth it still has problem with teeth and gum. However, 84% of pregnant women agree that dental caries can be prevent.

This table present the percentage of oral health disease in their mouth such as dental caries with filled and missing teeth including PUFA index. 63.3% of pregnancy women has dental caries experience with 3% had severe condition with abscess, pulp infection which should be refer to hospital because this can be effect to the fetal or mother quality of life. 53% of them shown that they had bleeding gum on probing during clinical exam, 45.2% shown periodontal disease with pocket depth 4-5mm (42.5%) and pocket depth more than 6 mm in 15 persons (6.8%).

The mean values of bleeding on probing (BOP) and untreated dental caries shown the association between Periodontal diseases. There was statistically significant p=0.0001 and p=0.023 respectively.

Table 1: Characteristic of pregnant women in Bolikhamxay Province.

General information	N	%
Districts		
Pasun	106	48.0
Pakkading	115	52.0
Age		
≤19	19	8.6
20-25	87	39.4
26-30	71	32.1
31-35	28	12.7
≥36	16	7.2
Ethnicity		
Laolum	202	91.4
Mong	8	3.6
Khamu	10	4.5
Other	1	0.5
Education		
Not attend/Primary school	80	36.2
Secondary school/ High school	102	46.2
Higher/University	39	17.6
Occupation		
Housewife	79	35.7
Farmer	80	36.2
Business	11	5.6
Employee	35	15.8
Other	16	7.2
Income		
Less than 1.000.000	30	13.6
1.000.001-3.000.000	152	68.8
3.000.001-5.000.000	36	16.3
More than 5.000.000	3	1.4

Table 2: Knowledge of oral health status among pregnant women in Bolikhamxay province.

Variable	N	%
Overall, how would you rate the health of your teeth and gum?		
Excellent	1	0.5
Very good/good	69	31.2
Fair	97	43.9
Poor	31	14.0
Don't know	23	10.4
My teeth are very important to me.		
Strongly agree	37	16.7
Agree	168	76.0
Indifferent	11	5.0
Disagree	5	2.3
Strongly disagree	NA	NA
No matter how much I do for my teeth, I will always have problems		
Strongly agree	9	4.1
Agree	171	77.4
Indifferent	11	5.0
Disagree	29	13.1
Strongly disagree	1	0.5
Tooth caries can be preventing		
Strongly agree	12	5.4
Agree	186	84.2
Indifferent	10	4.5
Disagree	13	5.9
Strongly disagree		

Table 3: Distribution of women according oral hygiene, habit, dental visit pregnancy related and periodontal disease.

Variable	Periodontal Disease		Prevalence Ratio (95%CI)
	With n (%)	Without n (%)	
Location (District)			χ^2=8.91 p=0.003
Pasun	59 (59.0)	47 (38.8)	0.66 (0.49-0.87)
Pakkading	41 (41.0)	74 (61.2)	1.49 (1.13-1.96)
Gestation age (weeks)			χ^2=0.044 p=0.978
≤16	26 (26.0)	30 (24.8)	1
17-24	29 (29.0)	36 (29.8)	0.94 (0.49-1.82)
25-32	45 (45.0)	55 (45.5)	1.01 (0.54-1.90)
Parity			χ^2=2.168 p=0.171
≥1	47 (47.0)	45 (37.2)	1
More then 2	53 (53.0)	76 (62.8)	1.1 (0.94-1.49)
Morning sickness			χ^2=11.06 p=0.001
Yes	67 (67.0)	54 (44.6)	1.67 (1.21-2.31)
No	33 (33.0)	67 (55.4)	1
Visited dentist			χ^2= 3.004 p=0.087
Yes	27 (27.0)	46 (38.0)	1
No	73 (73.0)	75 (62.0)	1.40 (0.94-2.08)
Alcohol consumption			χ^2= 5.195 p=0.028
Yes	32 (32.0)	57 (47.1)	1.47 (1.04-2.07)
No	68 (68.0)	64 (32.9)	1

Table 4: Percentage and mean of dental caries, bleeding gum and pocket depth among pregnant women in Bolikhamxay province.

Variable	N	%	Mean ± SD
Dental caries			
Decayed	123	55.7	2.17 ± 2.71
Missing teeth	62	28.1	0.58 ± 1.21
Filled	21	9.5	0.22 ± 0.91
DMFT	140	63.3	2.99 ± 3.36
PUFA	7	3.2	0.67 ± 0.48
Bleeding gum			
Absences condition	104	47.1	
Yes	117	52.9	3.25±4.42
Pocket depth			
Absences condition	121	54.8	
4-5mm	94	42.5	1.92±3.35
6 and more	15	6.8	0.19±4.42

Table 5: Mean values of Periodontal disease index determined by clinical examination among pregnant women in Bolikhamxay province.

Clinical examination	Periodontal diseases		t	p
	With Mean±SD	Without Mean±SD		
Bleeding	0.65±0.47	0.22±0.41	10.51	<0.0001
DT	0.52±0.50	0.36±0.48	5.23	0.023
DMFT	0.47±0.50	0.40±0.49	0.26	0.308

Discussion

Periodontal disease is an effect tissue disease distributed worldwide that can effect up to 90% of population. Poor oral hygiene, increasing of age, smoking, low education level, some ethnicities, and poor economic status have been reported as risk factors for periodontal disease [21]. In this study pregnant women in between 20 to 25 years old had 42% of periodontal disease. However, education, ethnic, religion, occupation and income didn't show the statistically significant. Pregnant women who live in Pakkading district had periodontal disease 1.49 times then who live in Paksun District and shown the statistically significant (p=0.003). Utilization of dental services is related to multiple factors including age, race/ethnicity, education, sociodemographic differences, availability of services, payment, personal and cultural choices, or lack of perceived need [22]. It is expected that the same factors apply to pregnant women. In addition, pregnant women and their dentists may concern about potential side-effects of dental treatment on complications during pregnancy or pregnancy outcomes. There is no reason to postpone dental treatment pregnancy, in fact, it should be encouraged to avoid unexpected problems and sequelae [23]. Pregnant women who have morning sickness had 67% periodontal disease and show strongly associated to periodontal disease (p=0.001). 63% all of them had dental caries, 53% reported that they had gum bleeding on probing and Periodontal disease 45%. Risk factors for dental caries and periodontal disease during pregnancy are not different from those before or after pregnancy. Pregnant women should maintain good oral health during pregnancy [24]. Most of the clinical sequelae of dental caries and periodontal diseases reported among pregnant women are a direct consequence of improper preventive and curative care during pregnancy. For example, some pregnant women and dental professionals postpone appropriate dental care during pregnancy because of fear to have negative pregnancy outcomes as consequence of dental treatment. This is while, in some countries, pregnancy women are referred to dental services during their routine obstetric evaluations. Pregnant women also may increase their risk for dental caries by greater intake of sugary snacks and drinks secondary to pregnancy cravings, and decreased attention to personal oral hygiene.

Nearly 60 to 75 percent of pregnant women have gingivitis as a accumulation of supragingival plaque which may be aggravated (but not caused) by changing hormones during pregnancy [25]. 53% of pregnant women had gum bleeding is one of indicator the periodontal disease which show the strongly statistically analyses (<0.0001). Gingivitis is an inflammatory condition of the soft tissues surrounding the teeth and periodontitis involves localized increase.

Conclusion

The association between bleeding gum and periodontal diseases in pregnant women shown strongly associated, socio-demographic and other factors unclear to indicate the associate with periodontal disease. This study and previous studies show how importance for the oral health related to general health. To intergrade health program between health professional and dentist need to provide oral health education and prevention program during maternal check-up or insert information to the maternal guide book. Pregnancy necessary to have frequency dental checkup before and after pregnant.

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