

Relationship between Oral Health of Pregnant Women and Low Birth Weight of the Newborns in Lao PDR.

Abstract

Introduction: The relationship between oral health during pregnancy and the birth weight of newborns is a significant area of research, as it has implications for both maternal and child health outcomes. Understanding this relationship can inform preventive strategies and interventions to improve maternal oral health and reduce the risk of low birth weight in newborns.

Objective: The aim of the study was identify the relationship between oral health of the pregnant women and low birth weight of the newborns.

Methods: This cohort study was conducted at 4 District hospitals in Vientiane capital, Lao PDR. The inclusion criteria of the pregnant femaleas follows: age 18-35 years old, any nation and ethnic group, 36 weeks and over of gestation with in term birth and who will be voluntary in the research. The tool for data collection was used a questionnaire form, oral examination form and record data of newborn weight. Data analysis was used the SPSS for descriptive analysis and Chi-square test to identify the association between oral health status of the mothers and low birth weight.

Results: This study was found a high association between dental caries and low birth weight (P -value 0.001), whereas the periodontal diseases was not significantly related with low birth weight infants (P -value > 0.05).

Conclusion: The prevalence of dental caries in pregnant women study group was high (84.90%) and it was the risk factor of low birth weight in newborns.

Keywords: Low birth weight, oral health pregnant women, Laos

Introduction

A newborn weighing less than 2,500g is a child with an abnormally birth weight, which the World Health Organization called “**Low birth weight/LBW**” [1, 2], they found this problem averaged 15 to 20% and more than 20 million people per year worldwidely estimated [3, 4], in Asian countries such as India has 15-20% [5], China has 9.30% [6], Thailand has 9.40% [7] and in Laos also has this mentioned issue with 19.40% [8].

Low birth weight infants were 20 times more likely to have complications and die comparing to normal birth weight babies [9]. The etiology of low birth weight as: the age of pregnant female less than 20 years old or more than 34 years old [10], preterm birth [11], born with mother who has malnutrition [12], from a mother underlying with a systemic disease or with chronic inflammation [13] and oral health problems [14]. Several studies have published that the relationship between oral health problems and low birth weight as dental caries was negatively associated [15, 16]. And there is also published that the tooth decay was significantly correlated to low birthweight [17], other conditions as periodontal disease was not related to lowbirth weight [18] and but other publication positively showed the association [19, 20, 21].

Therefore, the purpose of this study was to determine the prevalence of the low birth weight and to find the relationship between dental caries and periodontal disease with low weight with antenatal care of pregnant at 4 district hospitals.

Methodology

This research was a cohort study, it was conducted at 4 district hospitals at Xaythany, Sisattanak, Pakngum and Sangthong in Vientiane capital Lao PDR. With a total subject of 412 participating pregnant females. Inclusion criteria: age 18-35 years old, pregnant women with any nation and ethnic group, 36 weeks and over of gestation with in term birth, of course the pregnant women who was voluntary participated in this research. Exclusion criteria: pregnant woman who has smoking, drinking habits and drug-related status, with the systemic diseases, Psycho-neurological condition and disable pregnant women and number of teeth less than two in the sextant. The tool study used the interview information form to describe as age, education, occupation and ethnic group. Oral examination procedure: The calibrated examiner sat facing the patient who laid down or sat straight on the dental chair, using to reflex light or headlight and clearing for vision. Mouth mirror to reflex light and clearing for vision. Caries detection: Using explorer explored tooth surface for discolored and soft spot by applying light pressure. The diagnostic criteria used the WHO guideline and coding as follows: 0 = sound, 1 = decayed tooth, 2 = filled tooth with decay, 3 = filled tooth without decay, 4 = tooth missing due to

decay, 5= tooth missing for any other reason [23]. The criteria codes for periodontal status as: 0=healthy,1=bleeding after probing, 2 = calculus, 3=probing pocket 4-5 mm, 4= probing pocket >5 mm, 5= calculus with bleeding after probing, X=excluded sextant (less than two teeth present), 9=not recorded [24]. Record data of newborn after delivery will be taking from delivery document (Hospital record). Statistical analysis was done using SPSS (Statistical Package for Social Sciences) version 25.0 for analyze data [25]. The descriptive statistic frequency, percentage are used to present data on the following characteristics of mothers. Statistical analysis using Chi-square test [26].

Results

The study of pregnant women aged 18-35 years old with 412 subjects, 91.50% had showed the weight more than or equal to 50 Kg, 36.70% had a height of more than or equal to 160 cm, 61.70% had completed elementary-high school and 73.80% were housewives as detailed in *Table 1*.

The results of this study also found that dental caries was related to low birth weight in all 45 people with 84.90% (P-Value= 0.001), but it was found that periodontal disease is not related to low birth weight, there are 8 people with 15.10% (P-Value= 0.246). And monthly economic status income has no relationship with lower birth weight, there are 5 people accounting for 9.40% (P-Value= 0.796) as show in *Table 2*.

Table 1:General information

Weight (Kg)	Number	Percentage
< 40	3	0.70
40-44.9	4	1.00
45-49.9	28	6.80
≥50	377	91.50

Height (cm)	Number	Percentage
< 145	29	7.00
145-149.9	22	5.30
150-154.9	89	21.60
155-159.9	121	29.40
≥ 160	151	36.70

Education	Number	Percentage
Did not study	17	4.10
Primary school	84	20.40
Secondary school	145	35.20
High school	109	26.50
College up	57	13.90

Occupation	Number	Percentage
Housewife	304	73.80
Factory employee	32	7.80
Government employee	19	4.60
Private employee	11	2.70
Business	46	11.20

Table 2: The relationship between dental caries, periodontal diseases, family income and low birth weight.

	Normal birth weight		lower birth weight		<i>P</i> -Value
	Number	Percentage	Number	Percentage	
Dental status					0.001

Non dental caries	177	49.3	8	15.1	
Dental caries	182	50.7	45	84.9	
Total	359	87.10	53	12.90	
Periodontal status					
Non periodontal diseases	323	90.0	45	84.9	0.246
Periodontal diseases	36	10.0	8	15.1	
Total	359	87.10	53	12.90	
Family income (per month)					
< 1,700,000Kip	31	8.6	5	9.4	0.796
≥ 1,700,000Kip	328	91.4	48	90.6	
Total	359	87.10	53	12.90	

Discussion

This study found the prevalence of low birth weight was higher than other study like in China and Thailand [6, 7] but when compared with the report of the World Health Organization, the result of studies in India and in Laos were lower [3, 4, 5, 8].

Low birth weight was associated with oral health of mothers as dental caries compared to non-dental caries mothers, because toothache causes food intake, food intake is reduced and the mother received less energy. When the mother received less nutrients, the baby in the womb will also receive less nutrients, this was similar to the study done by Kadhim H in 2022 [17] and not related with the study by Geum Joon cho, 2020 and Mr. Elifuraha GS, 2007 [15,16]. Low birth weight was no relationship with the periodontal disease, may be this study selected the target group of participants in the age range of 18-35 years old, this age group was not have many problems with periodontal disease according to the World Health Organization. Therefore, the results of the study was not similar to the several studies by Moliner-Sánchez, 2020, Manrique-Corredor, 2019, Porto, E, 20 21 [19, 20, 21].

Conclusion

In this study, we did not found any women who had problems with soft mucous membrane disease in the oral cavity, probably because of the participants were a group that

did not come into contact with various factors such as drink alcohol, taking drugs and systemic diseases.

Ethical Approval:

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

Consent

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

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