



# The distribution of severe periodontitis in urban (Bangkok) and rural (Payao province) high risk to stress group of Thai population

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## Abstract

**Objective** The purpose of this study was to compare the periodontal status of rural and urban Thai population who were at high risk in stress.

**Materials and Methods** The cross-sectional study for severe periodontal destructive condition was carried out in over 35 years old Thai population. All first, second molars and central incisors of the total 1167 rural farmers from 4 villages in Payao province and 654 urban bank employees and secondary school teachers in Bangkok were examined using CPITN index. Only those having at least one tooth with CPITN score 4 received a full month examination and answered questionnaires as well as stress index. The data was analyzed by using SPSS software.

**Results** It was found that there was 17% of urban population having at least one tooth with CPITN4 while there was 27.9% of rural population. The number of teeth and surfaces of CPITN4 in rural population were higher than those in urban significantly. According to stress index, it was found that both of urban and rural population had high stress. But those in urban had higher stress than those in rural area (93.7% vs 80.2%). There was not significantly higher of CPITN4 teeth in high stress group in urban when compared to those in rural area. However, the number of CPITN4 surfaces in rural population was higher than those in urban area. The most common CPITN4 tooth was the right second molar (54.1%) whereas the lower left incisor was the least effected (3.1%).

**Conclusion** The study showed that severe periodontitis was higher in the rural than in urban populations. This seemed to be similar to the destructive periodontal condition between developing and developed countries which has been reported.

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*Key words: Periodontitis; Risk Factors; CPITN*

## Introduction

Periodontal disease is one of the most prevalent oral diseases not only in developing countries but also in developed countries<sup>1</sup>. Bacterial plaque is believed to be the

initiating cause of periodontal disease through the immunological system<sup>2</sup>, while other risk factors such as systemic diseases, environmental factors, genetic factors may be considered as modifying factors<sup>3,4</sup>. The inflammatory process plays a major role as a physiological defense

mechanism. Gingivitis is seen by gingival inflammation and can progress to periodontitis characterized by periodontal pocket and attachment loss. However, not all gingivitis proceeds to periodontitis<sup>5</sup>. Social stress in community is also suggested to be one of the risk factors which can modified the initial lesion of periodontal disease to severe destructive periodontitis<sup>6</sup>. The community periodontal index for treatment needs (CPITN) is the index used in epidemiological study for measurement of periodontal status. While CPITN score 4 can be interpreted as severe periodontitis<sup>7</sup>. The objective of this investigation is to study the distribution of severe periodontitis and compare the periodontal status of the rural and urban subjects in high risk group of stress in Thai population.

## Materials and Methods

The cross sectional study for severe periodontal destructive condition was carried out in over 35 years old Thai population both males and females.

## Population

The population selected in urban, who had relatively high stress from their profession, were 654 Bank employees and teachers in secondary schools located in Bangkok. In rural areas were 1,167 rice farmers who had limited access to oral health services from 4 villages in Chiangkam district, Payoa province. They were expected to have stress from the seasonal influence in farming and their poverty.

## Data collection

The population in both urban and rural areas were asked to have screening examination. Only those having at least one tooth with CPITN scored 4 had full mouth oral examination and filled in the questionnaires. The questionnaires included general information, medical history, smoking habit, nutritional status and information regarding stress index. The educational level was classified by primary school as low and higher than primary school as high education.

## Oral examination

All first, second molars and central incisors of upper and lower arches were assessed using CPITN index<sup>7</sup>. Lateral incisors were used if available in the absence of the central incisor. Only one of the examiners (NH) examined the subjects and recorded the measurement.

## Stress index

The Spielberger Trait Anxiety Index<sup>8</sup> was translated into Thai and used in this study. Thai and English versions of this index were tested by a group of bi-lingual postgraduate students of the Faculty of Education, Chulalongkorn University. There was no significant difference of their scores between two languages ( $p < 0.05$ ). Urban subjects filled in the index by themselves while trained personnel helped rural subjects. The index consisted of twenty questions with a potential score ranging from 0-60. One with score range 0-30 was classified as high stress and with score over 30 as low stress.

## Statistical analysis

The collected data was analyzed by SPSS software. Descriptive analysis was used to assess the questionnaires and the correlation between CPITN 4 (severe periodontitis) and stress was also tested.

## Results

The populations study and general status were demonstrated in table 1 and 2. The percentage of rural subjects with at least one tooth with CPITN 4 (27.9%) was statistical higher than those in urban (17.0%). The 12 index teeth with CPITN 4 and CPITN 3 were found in both subject groups. Subjects in rural group had more teeth per subjects than those in urban significantly (table 3). The same result was occurred when the data was assessed by surfaces (table 4). The most common CPITN 4 - tooth was the upper right second molar (54.1%) while the lower left central incisor was the least effected (3.1%) (Fig 1).

The complete data questionnaires were 79 from 111 for urban subjects and 248 from 325 for rural subjects. Both urban and rural subjects had high stress (93.7% VS 82.2%) but the percentage of urban subjects was higher than the rural subjects (table 5). There was no significant difference between the percentage of CPITN 4 - tooth in low and high stress groups in urban and rural area (table 6), but there was significantly lower CPITN 4 - Surface in high stress urban group (table 7).

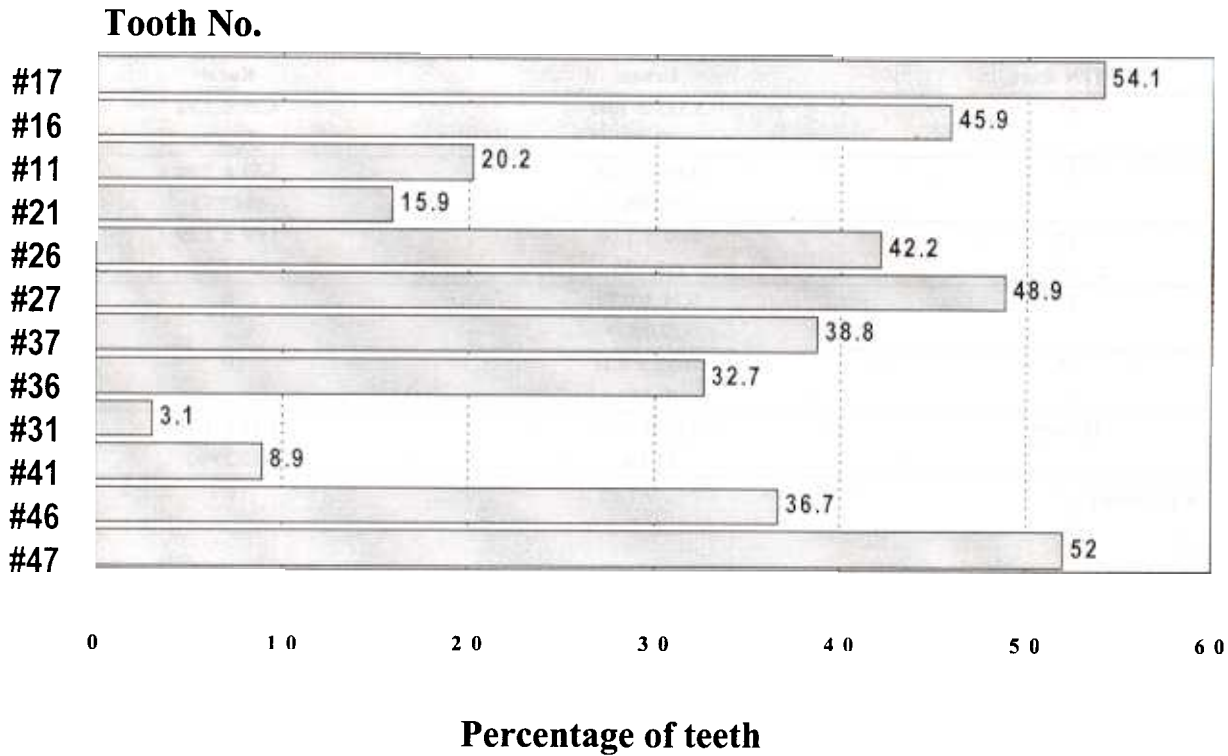


Fig 1 Percentage of teeth with CPITN scored 4

Table 1 Population study and percentage of persons having at least one tooth with severe periodontal destructive condition, CPITN scored 4 as compared to the national data<sup>9</sup>

Area	Population Surveyed	Having at least one tooth with CPITN4		Complete data
		Present study	National 1994 <sup>9</sup>	
Urban (Bangkok)	654	111 (17.0%)	23.1%	79
Rural (Payao)	1167	325 (27.9%)	20.7%	248
Total	1821		19.5%*	

\* National average

Table 2 General status of selected subjects.

Area	Sex		Age		Education	
	Male (%)	Female (%)	35-45 (%)	> 45 (%)	Low (%)	High (%)
Urban (79)	42 (53.2)	37 (46.8)	35 (44.3)	44 (55.7)	(2.5)	
Rural (248)	133 (53.6)	155 (46.4)	115 (46.4)	133 (53.6)		
Total (327)	175 (53.5)	152 (46.5)	150 (45.9)	177 (54.1)		

**Table 3** Percentage and mean ( $\pm$ SD) number of teeth per person by CPITN scores and area.

CPITN score	Urban	Rural
3*		
2*		
0*		0
Missing		1.23 $\pm$ 1.70 (10.25%)

\* P &lt; 0.001

**Table 4** Percentage and mean ( $\pm$ SD) number of surfaces per person by CPITN scores and area.

CPITN score	Urban	Rural
3*		
2*		
1*		
0*		
Missing		

\* P &lt; 0.001

**Table 5** Stress by area

Stress	Area		P
	Urban N (%)	Rural N (%)	
Low			.005
High			
Total			

**Table 6** Relationship between percentage of CPITN 4 - teeth by stress

Stress	% of CPITN 4 - tooth		ANOVA	Multiple R
	Urban	Rural		
Low	33.3	38.3		
High	27.58	35.1		0.219

**Table 7** Relationship between percentage of CPITN 4 - Surfaces by Stress

Stress	% of CPITN 4 - surfaces		ANOVA	Multiple R
	Urban	Rural		
Low	19.2	38.3		
High	10.5	14.0	0.006	0.208

## Discussion

The urban subjects in this study had lower prevalence of CPITN4 than those from rural areas and also than the national data<sup>9</sup> (table 1). It may be due to the fact that subjects in urban group consisted of Bank employees and teachers were better educated and had easier access to the oral health service. Consequently they were less affected by the severe periodontal destructive condition. Although the global view of the prevalence of CPITN4 subjects in 34-44 years old between developing countries and industrialized countries are not clearly illustrated<sup>10</sup>. The difference between rural and urban as in the present study was similar to the difference between some developing countries (Southeast Asia) and some industrialized countries (Scandinavia) as reported<sup>11</sup>. In this study it was found that there was no difference in percentage of CPITN 4 by tooth between urban and rural subjects in high stress group. However, CPITN 4 by surface in urban group is lower than that in rural group. It may be due to other risk factors which we will present separately from this paper. The most common teeth affected by severe periodontitis found in the present study were #17 and #47. In contrast to other study which found that the maxillary molars were the most affected teeth<sup>12</sup>. In conclusion from our finding, the distribution of severe periodontal breakdown in rural subjects was higher than in those in urban. However we can not find the relationship between stress and severe periodontitis. Bacterial factors and good care of oral hygiene seem still importance for disease control.

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# การกระจายของโรคปริทันต์อักเสบอย่างรุนแรง ในเขตเมือง (กรุงเทพฯ) และเขตต่างจังหวัด (พะเยา) ในคนไทยที่มีความเสี่ยงต่อความเครียดสูง

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## บทคัดย่อ

**วัตถุประสงค์** จุดมุ่งหมายในการศึกษานี้เพื่อเปรียบเทียบสภาวะของอวัยวะปริทันต์ของกลุ่มประชากรไทยในต่าง-จังหวัด และในเขตเมือง ซึ่งคาดว่าเป็นกลุ่มที่มีความเสี่ยงต่อความเครียด

**วิธีการศึกษา** เป็นการศึกษาแบบภาคตัดขวางเพื่อสำรวจสภาวะของอวัยวะปริทันต์ที่ถูกทำลายไปอย่างรุนแรงในกลุ่มประชากรชาวไทยที่มีอายุ 35 ปีขึ้นไป พันธกรามซี่ที่ 1, 2 และฟันคุดของเกษตรกรใน 4 อำเภอ จังหวัดพะเยา จำนวน 1,167 คน เป็นตัวแทนในต่างจังหวัด และ พนักงานแบงค์ และครูโรงเรียนระดับมัธยมศึกษาในกรุงเทพ จำนวน 654 คน เป็นตัวแทนในเขตเมือง จะถูกตรวจด้วยดัชนี CPITN อย่างคร่าว ๆ และผู้ที่มีฟันที่มี CPITN4 อย่างน้อย 1 ซี่ จะได้รับการตรวจบันทึกทั้งปาก และกรอกแบบสอบถามรวมทั้งดัชนีความเครียด ข้อมูลที่ได้จากการสำรวจจะถูกวิเคราะห์โดยใช้โปรแกรม SPSS

**ผลการวิจัย** พบว่าประชากรในเขตเมืองมีฟันที่มี CPITN 4 อย่างน้อย 1 ซี่ จำนวน 17% ในขณะที่ประชากรในต่างจังหวัดมีจำนวนถึง 27.9% จำนวนซี่ฟัน และด้านของฟันที่มี CPITN 4 ในประชากรต่างจังหวัดมีจำนวนสูงกว่าจำนวนในประชากรเขตเมืองอย่างมีนัยสำคัญ เมื่อแบ่งประชากรตามดัชนีความเครียดพบว่าประชากรทั้งในเมืองและต่างจังหวัดมีความเครียดสูง แต่ประชากรในเมืองมีความเครียดสูงกว่า (93.7% vs 80.2%) ไม่พบความแตกต่างของจำนวนซี่ฟันที่มี CPITN 4 ในกลุ่มที่มีความเครียดสูงทั้งประชากรในต่างจังหวัดหรือในเมือง แต่จำนวนด้านของฟันที่มี CPITN 4 ของประชากรในต่างจังหวัดจะสูงกว่าประชากรในเขตเมือง ฟันซี่ที่มี CPITN 4 ที่พบมากที่สุดถึงคือฟันกรามบนขาซี่ที่ 2 (54.1%) ที่พบน้อยที่สุดคือฟันคุดล่างซ้าย (3.1%)

**สรุป** จากการศึกษาพบว่าสภาวะของอวัยวะปริทันต์ที่ถูกทำลายไปอย่างรุนแรง พบได้ในประชากรต่างจังหวัดสูงกว่าประชากรในเขตเมือง ซึ่งผลการสำรวจครั้งนี้คล้ายกับรายงานผลการสำรวจลักษณะการทำลายของอวัยวะปริทันต์ในประชากรของประเทศกำลังพัฒนาซึ่งพบได้มากกว่า ในประเทศที่พัฒนาแล้ว