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Relationship between Anxiety and Burning Mouth Syndrome of Psychiatric Outpatients

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***Abstract*–Anxiety is the signal and phenomenon of a threat that can be divided into mild, moderate, severe, and very severe anxiety based on its level. Anxiety can cause pathological changes in the body including the oral cavity. Burning mouth syndrome (BMS) is one of the disorders in oral cavity that can be affected by anxiety. BMS is an oral disorder that consists of a burning pain in the mouth without any visible clinical manifestations. The question about whether anxiety is cause or effect of BMS remain unanswered. The objective of this study was to analyze the relationship between anxiety and burning mouth syndrome. This was an observational analytic study with cross sectional approach. Subjects were 50 psychiatric outpatients with main symptom of anxiety in Pirngadi Hospital Medan selected with purposive sampling. Data was collected by anamnesis, clinical examination, and interview with *Hamilton Rating Scale for Anxiety* (HRS-A) questionnaire. This study showed that there are 6 patients (12%) experiencing BMS. Fisher's exact test showed a significant result between anxiety level and BMS with p=0.001 (p<0.05). There was a significant correlation between anxiety level and BMS. Increased level of anxiety shows increasing number of BMS.**

Keywords–anxiety, anxiety level, burning mouth syndrome

I. INTRODUCTION

Anxiety is a warning and signal of an internal or external threat [1,2]. Acute or chronic anxiety symptoms are a major component of almost all psychiatric disorders [3]. Psychiatric disorders such as anxiety and depression based on Indonesia Health Research Data showed a prevalence of 6% in 2013 [4].

Anxiety can be divided by its level into mild, moderate, severe, and very severy [2]. Anxiety can cause pathological changes in the body including the oral cavity [5].Oral lichen planus (OLP), recurrent aphthous stomatitis (RAS), and burning mouth syndrome (BMS) can be affected by anxiety [5,6].

Burning mouth syndrome (BMS) can be characterized by pain in the mouth, usually accompanied by a burning sensation in the tongue, lips, and oral mucosa without any visible clinical manifestation [7]. Etiology of BMS is still unclear and the etiological factors can be divided into local, systemic, and psychogenic [8]. Persistence of the symptoms can cause emotional alterations of the patient [9]. Treatment of BMS aim to relieve the etiological factors whic can aggrevate the symptoms [8].

There were still not many study on the relationship between anxiety and BMS. Study about relationship between anxiety based on its level with BMS has not been done. The aim of this study is to analyze the relationship between anxiety and BMS of psychiatric outpatients in Pirngadi Hospital Medan.

II. MATERIALS AND METHODS

This study was approved by the Health Research Ethical Committee, University of Sumatera Utara number 304, and all subjects provided informed consent. This was an observational analytic study with cross sectional approach. Fifty psychiatric outpatients with main symptom of anxiety in Pirngadi Hospital Medan were selected by purposive sampling.

The subject criteria was psychiatric outpatients with main symptom of anxiety based on medical records, patient who are not menopausal, absence of systemic disease such as diabetes mellitus, were not taking angiotensin converting enzyme inhibitors (ACE inhibitors) medications (e.g., captopril, enalapril, and lisinopril), absence of denture wearing, and willing to be the subject of the study.

Data were collected by the use of Hospital's medical record to determine anxiety as the main symptom of the patients. Anxiety level was obtain from Hamilton Rating Scale for Anxiety (HRS-A) questionnaire. Diagnosis of BMS was based on anamnesis for determine pain or oral burning. Clinical examination was done to see the abscence of any lession in oral mucosa.

Data was analyzed with Fisher's exact test. It was used to analyze the relationship between anxiety level and BMS. This study showed that there is a relationship between anxiety level and BMS.

III. RESULTS

Demographic data of this study showed that the subjects of this study mostly were male, with frequency 29 (58%) and 21 (42%). Based on the age group, subjects aged ≥ 45 years were 21 (42%), 35-44 years

were 15 (30%), 25-34 years were 12 (24%), and 18-24 years were 2 (4%). (Table I and Table II)

TABLE I. DISTRIBUTION AND FREQUENCY PATIENTS BASED ON GENDER

Gender	n	%
Male	29	58
Female	21	42
Total	50	100

TABLE II. DISTRIBUTION AND FREQUENCY PATIENTS BASED ON AGE

Age	n	%
18-24 years	2	4
25-34 years	12	24
35-44 years	15	30
≥45 years	21	42
Total	50	100

This study showed that subjects with mild anxiety were 39 (78%) while the subjects with moderate anxiety were 11 (22%). No subject with severe anxiety and very severe anxiety was found in this study. (Table III)

TABLE III. DISTRIBUTION AND FREQUENCY OF ANXIETY BASED ON ITS LEVEL

Anxiety	n	%
Mild anxiety	39	78
Moderate anxiety	11	22
Severe anxiety	0	0
Very severe anxiety	0	0
Total	50	100

Distribution and frequency of burning mouth syndrome in psychiatric outpatients with main symptom of anxiety showed that from 50 subjects, 6 persons (12%) had BMS while 44 others (88%) did not have BMS. (Table IV)

TABLE IV. DISTRIBUTION AND FREQUENCY OF BURNING MOUTH SYNDROME

BMS	n	%
BMS (+)	6	12
BMS (-)	44	88
Total	50	100

Table V confirmed that from 6 cases with BMS, 1 patient (2%) had mild anxiety while 5 patients (10%) were with moderate anxiety. No BMS data was found on severe anxiety and very severe anxiety.

TABLE V. DISTRIBUTION AND FREQUENCYOF BMS BASED ON ANXIEY LEVEL

Anxiety	BMS	
	n	%
Mild	1	2
Moderate	5	10
Severe	0	0
Very severe	0	0
Total	6	12

Relationship between anxiety level and BMS was calculated by Fisher's exact test with $p<0.05$ ($p=0.001$). Therefore, this study showed that there is a significant correlation between anxiety level and BMS. (Table VI)

TABLE VI. RELATIONSHIP BETWEEN ANXIETY LEVEL AND BMS

Anxiety	BMS				p
	BMS (+)		BMS (-)		
	N	%	n	%	
Mild	1	2	38	76	0.001
Moderate	5	10	6	12	
Severe	0	0	0	0	
Very severe	0	0	0	0	
Total	6	12	44	88	

IV. DISCUSSION

Anxiety are more common in female than in male by a ratio of 2:1 [10]. The National Comorbidity Study reported that anxiety occurs more often in female (30.5%) compared to male (19.2%) [1]. de Lijster et al. study also indicate that anxiety are more common in female compared to male with percentage, respectively, 70.55% and 29.45% [11]. In contrast, this study showed higher percentage of male (58%). Difference in the result can be caused due to the methodology research differentiation. Female who have experienced menopausal was excluded as a subject in this study because menopausal is one of the factors in the occurrence of BMS.

Age range of anxiety are vary. In this study, the age group of ≥ 45 years were higher than the other age groups with 21 (42%) persons. World Health Organization (WHO) reported that anxiety in Brazil and Netherlands are also more common in ≥ 45 years age group.[12] Anxiety occurs if a person can not adapt to overcome with the causes of his/her anxiety such as social relations problems, occupation matter, poor environment, finances, menopause, or trauma. Anxiety can occur to anyone depending on their reaction or response to the cause of anxiety [3].

Anxiety level can be divided into mild, moderate, severe, and very severe [2]. The result of this study showed that mild anxiety are more experienced in the subjects (78%). According to Mykletun et al. study in Norway from 15.5% persons that experienced anxiety; 9.9% persons were mild anxiety, 4.6% were moderate, and 1% were severe [13]. Mild anxiety is a common anxiety that helps a person to solve problems, think, act, or protect themselves; such as helping student to focus in preparation for the exam [2]. Subjects in this study were psychiatric outpatients who had been treated and controlled periodically so that severe and very severe anxiety was not encountered.

The result of this study indicated that the distribution and frequency of BMS in psychiatric outpatients with main symptom of anxiety was 12%. Suresh et al. study on patient with anxiety showed that prevalence of BMS were 2.87%, whereas Aditya et al. reported that 9.5% patient with mental disorders including anxiety experiencing BMS [5.14]. There is a lack of strict adherence to diagnose BMS [15]. The differences in prevalence can occurs because of differentiation in BMS diagnostic criteria.

Study about BMS and anxiety is still rarely done and question about whether anxiety is cause or effect of BMS remains unanswered [15]. Buljan et al.

investigated the relationship between anxiety, depression, BMS and showed from 120 subjects, as many as 42 subjects suffering from BMS with anxiety levels higher than other subjects [16]. Spanemberg et al. evaluated that 90% of BMS patient declared to feel anxiety symptoms such as nervous, tense, and worried [8].

This study showed that patients with moderate anxiety that experiencing BMS were more than patients with mild anxiety, with percentage, respectively, 10% and 2%. The result of Suresh et al. study showed patients with severe anxiety who experienced BMS was 75%, moderate anxiety was 25%, and no patient with mild anxiety [5]. Anxiety can cause changes in the oral cavity [6]. Increased levels of anxiety can worsen body condition including oral cavity [2].

Buljan et al. showed that there was an association between anxiety and BMS with $p<0.01$ and strong correlation between anxiety level and severity of BMS [12].In this study, relationship between anxiety level and BMS has a significant correlation ($p=0.001$). Anxiety would happen because of the response to the stressor; one of the example is occupation matter [12]. Anxiety as an emotional response will be forwarded to the center of emotional, which is called limbic system [3]. Hypothalamus is a part of limbic system that will release a hormone to stimulate pituitary gland in order to produce adrenocorticotropic hormone. Adrenocorticotropic hormone will stimulate adrenal cortex to release cortisol [17]. Anxiety is related to the increase of cortisol. Cortisol has a role in regeneration and protection of neural tissue. High levels of cortisol can damage the neural tissues and stimulates neuropathic changes which may evoke symptoms in BMS [18].

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