

[DOI] 10.12016/j.issn.2096-1456.202440479

· 临床研究 ·

灼口综合征患者睡眠质量特点及其影响因素初步分析

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【摘要】 目的 探讨灼口综合征(burning mouth syndrome, BMS)患者睡眠质量状况及其影响因素, 为制定改善BMS患者的睡眠干预措施提供依据。**方法** 本研究已通过单位医学伦理委员会审查批准, 并获得患者知情同意。本研究选取150例BMS患者作为研究对象, 同时纳入150例健康对照者, 使用匹兹堡睡眠质量指数量表(Pittsburgh sleep quality index, PSQI)评估睡眠质量, 使用视觉模拟评分法(visual analog scale, VAS)评估口腔黏膜疼痛程度, 广泛性焦虑量表(generalized anxiety disorder 7-item scale, GAD-7)评估焦虑症状的发生频率, 患者健康问卷抑郁量表(patient health questionnaire-9, PHQ-9)评估抑郁症状的发生频率。采用单因素分析方法筛选影响BMS患者睡眠质量的潜在因素, 并运用多元线性回归模型分析其独立危险因素。**结果** BMS患者的PSQI评分为(7.61 ± 4.29)分, 高于健康对照者, 差异具有统计学意义($P = 0.016$)。在PSQI的子量表评分方面, BMS患者相较于健康对照者, 入睡时间延长、睡眠时间减少、睡眠效率降低($P < 0.05$)。伴有睡眠困难的BMS患者的GAD-7和PHQ-9评分高于无睡眠困难的BMS患者($P < 0.001$), 但疼痛VAS评分两者无显著差异($P = 0.068$)。多元线性回归分析结果显示, 病程长(>6个月)、伴随其他全身症状(头痛、精神压力大)以及抑郁症状评分高可能是影响BMS患者睡眠质量的独立风险因素。**结论** 对于BMS患者, 病程长、存在头痛、精神压力大、抑郁症状可能是其睡眠质量的独立影响因素。

【关键词】 灼口综合征; 睡眠质量; 睡眠困难; 烧灼感; 负性情绪; 焦虑症状; 抑郁症状; 影响因素

【中图分类号】 R78 **【文献标志码】** A **【文章编号】** 2096-1456(2025)05-0377-08

【引用著录格式】 卢成辉, 杨成龙, 周璇, 等. 灼口综合征患者睡眠质量特点及其影响因素初步分析[J]. 口腔疾病防治, 2025, 33(5): 377-384. doi:10.12016/j.issn.2096-1456.202440479.

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【Abstract】 Objective To investigate the sleep quality in patients with burning mouth syndrome (BMS) and its influencing factors, providing a basis for developing sleep intervention measures to reduce the impact of BMS symptoms. **Methods** This study was reviewed and approved by the Medical Ethics Committee, and informed consent was obtained from patients. A total of 150 patients with BMS and 150 healthy volunteers were enrolled as subjects in this study. The

【收稿日期】 2024-11-29; **【修回日期】** 2025-02-11

【基金项目】 上海卫健委临床科研资助项目(202040458); 上海交通大学医学院附属新华医院“学科攀峰计划”建设项目(XKPF2024B500)

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Pittsburgh sleep quality index (PSQI) was used to assess the sleep quality of patients with BMS. Visual analog scale (VAS) was used to assess the degree of oral mucosal pain, generalized anxiety disorder 7-item scale (GAD-7) was used to assess the frequency of anxiety symptoms, and the patient health questionnaire depression questionnaire (PHQ-9) was used to assess the frequency of depression symptoms. Univariate analysis was performed to identify potential influencing factors affecting sleep quality in patients with BMS, and multiple linear regression analysis was employed to determine independent risk factors. **Results** The PSQI score for patients with BMS was 7.61 ± 4.29 , which was significantly higher than that of healthy controls ($P = 0.016$). In the PSQI subscale analysis, patients with BMS exhibited increased sleep latency, decreased sleep duration, and lower sleep efficiency compared to healthy controls ($P < 0.05$). Patients with BMS and comorbid sleep difficulties had significantly higher scores on GAD-7 and PHQ-9 compared to the patients with BMS without sleep difficulties ($P < 0.001$), but there was no significant difference in pain VAS scores between the two ($P = 0.068$). Multiple linear regression analysis revealed that longer disease duration (> 6 months), the presence of systemic concomitant symptoms (such as headache and mental stress), and higher depression scores were identified as independent risk factors affecting sleep quality in patients with BMS. **Conclusion** For patients with BMS, long course of illness, presence of headaches, high mental stress, and depressive symptoms may be independent factors affecting their sleep quality.

【Key words】 burning mouth syndrome; sleep quality; sleep difficulties; burning sensation; emotional disturbance; anxiety symptoms; depressive symptoms; influencing factors

J Prev Treat Stomatol Dis, 2025, 33(5): 377-384.

【Competing interests】 The authors declare no competing interests.

This study was supported by the Clinical Research Funding, Shanghai Municipal Health Commission (No. 202040458) and the grants from the Construction Project of the “Discipline Peak-Climbing Plan” of Xinhua Hospital Affiliated to Shanghai Jiao Tong University School of Medicine (No. XKPF2024B500).

灼口综合征(burning mouth syndrome, BMS)被认为是一种慢性神经性疼痛疾病,在普通人群中发病率可达40%,尤其好发于中老年绝经期前后的女性^[1-2]。BMS患者通常缺乏与其典型口腔症状相关的客观临床表现和病理变化^[3-4],但病情的持续和反复常使其伴随睡眠困难,从而严重影响身心健康^[5-6]。疼痛的慢性化可能通过影响神经内分泌系统和大脑的内源性疼痛调节与情绪调节系统功能,对患者的睡眠质量和生活质量产生不利影响^[7-8]。充足和优质的睡眠对各项身体功能至关重要,睡眠不足和睡眠质量差会破坏激素调节、免疫功能和代谢过程,这可能与多种不良健康后果相关,包括疼痛慢性化、心血管疾病及情绪障碍等慢性疾病的发展和加重^[9-10]。最近的研究表明,睡眠困难可能是引起BMS的潜在危险因素,而BMS的不断进展也可能反过来影响睡眠质量,从而形成恶性循环^[11-12]。尽管目前的研究证据尚未明确BMS与睡眠困难之间的直接因果关系,但已有研究支持睡眠困难与BMS症状之间存在相关性。国外研究结果显示,BMS患者的睡眠质量普遍较健康人群差,但国内目前针对BMS患者睡眠质量特点及其相关影响因素的临床研究仍然较为缺乏^[13-14]。

因此,本研究通过回顾性研究调查上海和桂

林两个地区的BMS患者与健康人群的睡眠质量现状,分析BMS患者睡眠质量的相关影响因素,以期制定改善BMS患者的睡眠干预措施提供依据,提高治疗的有效性。

1 对象和方法

1.1 研究对象

选取2022年6月—2024年1月就诊于上海交通大学医学院附属新华医院口腔科和桂林医学院附属口腔医院口腔黏膜病科的150例BMS患者作为研究对象。同时,从同一医院进行口腔健康咨询的门诊患者中选取150例性别和年龄相匹配的健康对照者^[15]。所有参与研究的患者均知情同意,并签署了相关同意书。研究方案已获得医院医学伦理委员会的批准(批准号:XHEC-C-2022-085-3、KQ-0035),并依照《赫尔辛基宣言》制定的伦理准则进行研究。

BMS患者的纳入标准^[16-17]:①年龄 ≥ 18 岁;②口腔黏膜烧灼样疼痛等感觉异常,每天持续超过2 h,且症状持续时间超过3个月;③临床检查发现口腔黏膜表面无明显异常;④未发现导致口腔黏膜烧灼样疼痛的局部或全身原因,如口腔黏膜炎、舌炎、口腔念珠菌感染、贫血、糖尿病、干燥综合征、

心血管疾病以及维生素与微量元素缺乏等。排除标准:①口腔黏膜、牙体或牙周组织等有可检查到的器质性病变伴疼痛,如复发性阿弗他溃疡、深龋、急性牙髓炎、牙周炎等;②口面部神经痛病史,如三叉神经痛、舌咽神经痛;③头颈部放疗史,伴唾液腺疾病或其它口腔黏膜病;④严重心、肝、肾及血液系统等重要脏器疾病;⑤怀孕或哺乳期妇女。健康对照者的纳入标准为:①年龄 ≥ 18 岁;②身体健康状况良好,口腔黏膜正常,无严重的口腔疾病、慢性疾病、精神疾病及精神药物使用史。

1.2 研究方法

1.2.1 基线特征及BMS患者口腔症状记录 根据《灼口综合征临床实践循证指南》的诊断标准,口腔黏膜专科医生通过询问病史和临床表现对BMS进行诊断。基线特征的记录包括:受试者的年龄、性别、高血压、糖尿病和吸烟饮酒史。BMS患者的口腔症状、病程、口腔伴随症状(如口干、味觉异常)、全身伴随症状(如焦虑/抑郁、头痛、精神压力大)等。

1.2.2 睡眠质量调查 使用匹兹堡睡眠质量指数量表(pittsburgh sleep quality index, PSQI)评估受试者近期的睡眠状况,量表包括睡眠质量、入睡时间、睡眠时长、睡眠效率、睡眠紊乱、催眠药物的使用、日间功能障碍7个评估子项。评分标准:0~5分表示没有睡眠困难,>5分表示存在睡眠困难,其中6~10分为轻度睡眠困难,11~15分为中度睡眠困难,16~21分为重度睡眠困难^[18]。

1.2.3 疼痛、焦虑及抑郁评估 使用视觉模拟评分法(visual analog scale, VAS)评估口腔黏膜疼痛程度,其中VAS评分大于0分表示存在疼痛^[19];广泛性焦虑量表(generalized anxiety disorder 7-item scale, GAD-7)评估焦虑症状的发生频率,GAD-7评分大于5分表示存在焦虑症状^[20];患者健康问卷抑郁量表(patient health questionnaire-9, PHQ-9)评估抑郁症状的发生频率,PHQ-9评分大于5分表示存在抑郁症状^[21]。

1.3 统计学分析

分类变量采用频数(百分率)描述,组间对比采用 χ^2 检验或Fisher精确检验;连续变量进行正态性检验,符合正态分布以均值 $\pm$ 标准差($\bar{x} \pm s$)表示,两个独立样本采用 t 检验,多个独立样本采用单因素方差分析;在进行两个独立样本的比较时,应用Mann-Whitney U 秩和检验;而在多个独立样本

比较的情况下,则采用Kruskal-Wallis H 检验。对性别、年龄、教育程度、既往史、个人史、病程、口腔伴随症状和全身伴随症状等采用虚拟变量编码,对疼痛、焦虑和抑郁评分等直接使用原始数据,采用单因素分析(输入)确定影响睡眠质量的潜在因素($P < 0.15$),最后进行多元线性回归分析确认危险因素。使用方差膨胀因子(variance inflation factor, VIF)评估自变量之间的共线性,通常认为VIF值 > 10 被认为存在显著的共线性问题。所有数据采用SPSS 26.0统计软件进行分析, $P < 0.05$ 为差异具有统计学意义。

2 结果

2.1 BMS患者与健康对照者基线特征

在本项研究中,150例BMS患者与150例健康对照组在性别、年龄及是否有高血压、糖尿病和吸烟饮酒史上比较的差异无统计学意义($P > 0.05$),纳入资料具有可比性(表1)。

表1 灼口综合征患者与健康对照者基线特征

Table 1 Baseline characteristics of patients with burning mouth syndrome and healthy controls N (%)

Characteristics	BMS ($n = 150$)	Healthy control ($n = 150$)	χ^2/t	P
Gender				
Male	23 (15.33)	31 (20.67)	1.445	0.293
Female	127 (84.67)	119 (79.33)		
Age/years, $\bar{x} \pm s$	57.23 $\pm$ 10.26	56.94 $\pm$ 10.54	0.239	0.812
History of smoking and alcohol use				
No	136 (84.00)	131 (87.33)	0.851	0.461
Has	14 (16.00)	19 (12.67)		
Hypertensive				
No	120 (80.00)	129 (86.00)	1.914	0.219
Yes	30 (20.00)	21 (14.00)		
Diabetes				
No	135 (90.00)	141 (94.00)	0.202	0.287
Yes	15 (10.00)	9 (6.00)		

BMS: burning mouth syndrome

2.2 BMS患者与健康对照者睡眠质量调查

BMS患者的PSQI评分为(7.61 ± 4.29)分,显著高于健康对照组(6.45 ± 4.08)分($t = 2.415, P = 0.016$)。与健康对照组相比,BMS患者表现出显著延长的入睡时间、缩短的睡眠时长以及降低的睡眠效率($P < 0.05$)(表2)。

表2 灼口综合征患者与健康对照者睡眠质量评分比较
Table 2 Comparison of sleep quality scores between patients with burning mouth syndrome and healthy controls $\bar{x} \pm s$

Characteristics	BMS (n = 150)	Healthy control (n = 150)	t	P
PSQI	7.61 ± 4.29	6.45 ± 4.08	2.415	0.016
Sleep quality	1.35 ± 0.80	1.26 ± 0.83	0.989	0.324
Sleep latency	1.65 ± 1.23	1.13 ± 1.11	3.845	< 0.001
Sleep duration	1.09 ± 0.76	0.82 ± 0.68	3.212	0.001
Sleep efficiency	1.02 ± 1.06	0.69 ± 0.96	2.852	0.005
Sleep disturbances	1.06 ± 0.57	1.10 ± 0.73	-0.529	0.597
Sleep medication	0.39 ± 0.96	0.37 ± 0.92	0.185	0.853
Daytime dysfunction	1.05 ± 1.12	1.11 ± 1.25	-0.388	0.698

PSQI: Pittsburgh sleep quality index, scoring criteria: 0-5 indicates no sleep difficulties, > 5 indicates the presence of sleep difficulties, 6-10 indicates mild sleep difficulties, 11-15 indicates moderate sleep difficulties, and 16-21 indicates severe sleep difficulties

2.3 不同睡眠质量特点BMS患者的疼痛、焦虑、抑郁评分比较

BMS患者睡眠困难的发生率为64.67%，其中48%患者出现睡眠困难与焦虑和/或抑郁共病。伴睡眠困难BMS患者的GAD-7、PHQ-9评分高于无睡眠困难者($P < 0.001$)(表3)。

2.4 不同特征BMS患者的睡眠质量比较

不同性别、年龄以及是否有烟酒史、高血压病

史、糖尿病病史患者的PSQI评分差异无统计学意义($P > 0.05$)；而不同病程、口腔伴随症状、全身伴随症状患者的PSQI评分差异有统计学意义($P < 0.05$)(表4)。

2.5 BMS患者睡眠质量影响因素的Pearson相关性分析

相关性分析结果显示，BMS患者的睡眠质量与疼痛、焦虑、抑郁评分之间存在显著的正相关关系($P < 0.05$)(表5)。

2.6 BMS患者睡眠质量影响因素的多元线性回归分析

以PSQI评分为因变量，以单因素分析中差异有统计学意义的自变量：病程(0 = ≤ 6个月；1 = > 6个月)、口腔伴随症状(0 = 仅烧灼感；1 = 烧灼感伴口干；2 = 其他，如味觉异常)、全身伴随症状(0 = 仅烧灼感；1 = 烧灼感伴焦虑/抑郁；2 = 其他，如头痛、精神压力大)、VAS、GAD-7、PHQ-9等作为自变量构建模型进行多元线性回归分析。VIF显示各自变量之间并不存在显著的共线性问题，回归模型可靠，结果表明病程长(> 6个月)、其他全身伴随症状(如头痛、精神压力大)、抑郁症状PHQ-9评分高可能是影响BMS患者睡眠质量的独立危险因素(表6)。

表3 不同睡眠质量灼口综合征患者疼痛、焦虑及抑郁症状评分比较

Table 3 Comparison of pain, anxiety, and depression symptom scores in patients with burning mouth syndrome with different sleep quality

Characteristics (n = 150)	N (%)	VAS ($\bar{x} \pm s$)	GAD-7 ($\bar{x} \pm s$)	PHQ-9 ($\bar{x} \pm s$)
Without sleeping difficulties	53 (35.33)	3.50 ± 2.09	4.68 ± 5.05	2.34 ± 3.04
With sleeping difficulties	97 (64.67)	4.20 ± 2.31	8.46 ± 6.12	5.88 ± 4.53
t		-1.837	-3.844	-5.093
P		0.068	< 0.001	< 0.001

Visual analog scale (VAS) was used to assess the degree of oral mucosal pain, generalized anxiety disorder 7-item scale (GAD-7) was used to assess the frequency of anxiety symptoms, and the patient health questionnaire depression questionnaire (PHQ-9) was used to assess the frequency of depression symptoms

3 讨论

3.1 BMS患者睡眠质量分析

本研究结果显示，BMS患者PSQI评分高于健康人群，提示BMS患者普遍存在睡眠质量下降的问题，该结果与前期研究的结果一致^[13-14]。睡眠是维持神经-免疫-内分泌网络完整性、保持体内动态平衡的重要生理过程^[22-23]。研究显示，我国成人中有40%的人经历睡眠困难，而老年人的比例可高达60%，失眠是最常见的睡眠问题^[24-25]。Rezazadeh

等^[26]在一项纳入19例患者的小样本研究中发现，BMS患者中睡眠困难的发生率为89.5%；而Adamo等^[13]在一项纳入204例患者的大样本多中心调查中发现这一比例为78.8%。本研究的150例BMS患者中睡眠困难的发生率为64.67%。这些结果均表明，BMS患者普遍存在睡眠质量下降问题。本研究发现，BMS患者的睡眠困难主要表现为入睡时间延长、睡眠时间减少、睡眠效率降低，这与既往系统综述的分析结果基本一致^[11]。睡眠问题如失眠

表4 不同人口学及临床特征的灼口综合征患者睡眠质量评分比较
Table 4 Comparison of sleep quality scores in patients with burning mouth syndrome based on various demographic and clinical characteristics

Characteristics (n = 150)	N (%)	PSQI ($\bar{x} \pm s$)	t/F	P
Gender				
Male	23 (15.33)	6.87 $\pm$ 4.06	-0.904	0.368
Female	127 (84.67)	7.75 $\pm$ 4.33		
Age/yards				
≤ 60	91 (62.35)	7.41 $\pm$ 4.45	-0.732	0.465
> 60	59 (37.65)	7.93 $\pm$ 4.05		
History of smoking and alcohol use				
No	136 (84.00)	7.53 $\pm$ 4.24	-0.746	0.457
Has	14 (16.00)	8.43 $\pm$ 4.83		
Hypertensive				
No	120 (80.00)	7.43 $\pm$ 4.42	-1.028	0.305
Yes	30 (20.00)	8.33 $\pm$ 3.70		
Diabetes				
No	135 (90.00)	7.67 $\pm$ 4.40	0.519	0.604
Yes	15 (10.00)	7.07 $\pm$ 3.22		
Disease duration/months				
≤ 6	77 (52.94)	6.40 $\pm$ 3.61	-3.700	< 0.001
> 6	73 (47.06)	8.89 $\pm$ 4.59		
Oral accompanying symptoms				
Only burning sensation	32 (21.33)	5.91 $\pm$ 4.03	7.448	0.001
Burning sensation accompanied by xerostomia	70 (46.67)	8.96 $\pm$ 4.28 ^a		
Other (e.g., taste loss)	48 (32.00)	6.79 $\pm$ 3.92		
Systemic accompanying symptoms				
Only burning sensation	28 (19.33)	4.14 $\pm$ 3.24 ^b	15.804	< 0.001
Burning sensation accompanied by anxiety/depression	50 (41.34)	9.32 $\pm$ 4.05		
Other (e.g., headache, high mental stress)	72 (39.33)	7.78 $\pm$ 4.06 ^c		

PSQI: Pittsburgh sleep quality index; a indicates that the PSQI scores of patients with burning sensation and xerostomia were significantly greater than those of patients with burning sensation only and other oral accompanying symptoms (taste loss) ($P < 0.05$); b indicates that the PSQI scores of patients with burning and anxiety/depression were significantly greater than those of patients with burning sensation only ($P < 0.05$); c indicates that the PSQI scores of patients with other systemic accompanying symptoms (headache, high mental stress) were significantly greater than those of patients with burning sensation only ($P < 0.05$)

表5 灼口综合征患者睡眠质量评分的相关性分析
Table 5 Correlation analysis of sleep quality scores in patients with burning mouth syndrome

Characteristics	Statistical value	VAS	GAD-7	PHQ-9
PSQI	<i>r</i>	0.220	0.430	0.550
	<i>P</i>	0.007	< 0.001	< 0.001

GAD-7: generalized anxiety disorder 7-item scale; PHQ-9: patient health questionnaire-9; PSQI: Pittsburgh sleep quality index; VAS: visual analog scale

和睡眠碎片化,可能导致心理困扰,进而影响身心健康^[27-28]。在本研究中,48%BMS患者出现睡眠困难,并伴有焦虑和/或抑郁症状。伴有睡眠困难的患者在GAD-7和PHQ-9评分上明显高于没有睡眠困难的患者。此外,存在烧灼感并伴有口干或焦虑、抑郁的患者,其PSQI评分也高于仅有烧灼感的

患者。这些结果突显了口腔烧灼感、睡眠质量和心理情绪之间的关系^[29],最近的研究也支持睡眠困难与BMS症状之间的相关性^[11]。研究表明,睡眠不足会削弱神经-免疫-内分泌网络的功能,增加慢性疾病(如糖尿病和心血管疾病)的易感性,并导致激素紊乱,进一步加剧代谢失调,导致体重增加、慢性疼痛等健康并发症^[30]。此外,睡眠不足还可能引发情绪紊乱,包括易怒、压力,甚至抑郁和焦虑等负面情绪^[31-32]。这些因素之间的相互作用可能加重BMS的口腔症状和全身症状^[33]。

3.2 BMS患者睡眠质量影响因素分析

研究表明,影响睡眠质量的因素主要包括睡眠习惯^[34]、生活方式^[35]、健康状况^[36]和心理因素^[37]等。本研究的多元线性回归分析结果显示,病程较长、伴其他全身伴随症状(如头痛、精神压力

表6 灼口综合征患者睡眠质量评分的多元线性回归分析
Table 6 Multivariate linear regression analysis of sleep quality scores in patients with burning mouth syndrome

Variable	<i>B</i>	<i>SE</i>	<i>B</i> ′	<i>t</i>	<i>P</i>	95% <i>CI</i>		Collinearity diagnosis	
						Lower	Upper	Tolerance	VIF
Constant	2.756	0.909		3.032	0.003	0.959	4.554		
Disease duration									
≤ 6 months	Ref	—	—	—	—	—	—		
> 6 months	1.298	0.597	0.152	2.175	0.031	0.118	2.479	0.869	1.151
Oral accompanying symptoms									
Only burning sensation	Ref	—	—	—	—	—	—		
Burning sensation accompanied by xerostomia	1.153	0.782	0.135	1.475	0.142	-0.392	2.699	0.508	1.967
Other (e.g., taste loss)	-0.335	0.849	-0.037	-0.395	0.693	-2.013	1.343	0.493	2.027
Systemic accompanying symptoms									
Only burning sensation	Ref	—	—	—	—	—	—		
Burning sensation accompanied by anxiety/depression	1.851	0.961	0.204	1.926	0.056	-0.049	3.752	0.377	2.656
Other (e.g., headache, high mental stress)	2.448	0.829	0.286	2.955	0.004	0.810	4.086	0.451	2.216
VAS	-0.055	0.142	-0.029	-0.386	0.700	-0.336	0.226	0.758	1.320
GAD-7	0.067	0.064	0.094	1.052	0.295	-0.059	0.193	0.526	1.901
PHQ-9	0.376	0.088	0.385	4.281	< 0.001	0.202	0.550	0.523	1.914

GAD-7: generalized anxiety disorder 7-item scale; PHQ-9: patient health questionnaire-9; VAS: visual analog scale; VIF: variance inflation factor

大)、抑郁症状评分高,可能是影响BMS患者睡眠质量的独立风险因素。Adamo等^[13]研究证实,BMS患者存在睡眠困难,并且与焦虑和抑郁共病,而疼痛强度与睡眠质量之间没有显著关系,表明睡眠困难和负性情绪可能是加重BMS症状的因素,这与本研究的结果基本一致。在本研究中,48%的BMS患者出现睡眠困难,并伴有焦虑和/或抑郁症状,然而疼痛强度对睡眠质量无显著影响。分析原因可能与BMS疼痛的特征有关,BMS通常表现为晨轻午重,即症状在早上较轻,白天加重,晚上减轻,因此对睡眠的影响可能较小,其潜在关系仍需进一步研究^[2, 38]。研究表明,较长的病程、伴有头痛和较大精神压力等全身症状,以及较高的抑郁评分与较低的睡眠质量相关。这提示,长期的病程可能导致患者疼痛的慢性化,进而形成疼痛情绪和行为的异常模式,导致对睡眠的消极认知,进一步加重睡眠困难^[39]。而低睡眠质量也可能影响个体应对压力的能力,增强对情绪刺激的敏感性,从而形成睡眠困难与负性情绪共病的恶性循环^[40-41]。此外,有研究表明,伴有头痛^[31]、精神压力大^[42]和负性情绪^[43]的患者,发生睡眠困难的风险增加,突出了口腔烧灼感、睡眠和全身症状之间的关系。尽管目前尚无证据表明BMS和睡眠质量下降之间存在直接的因果关系,但可以推测,两者可能相互影响,提高睡眠质量可能有助于减轻BMS症状的严重程度,这一假设需要在未来的研究中

进一步验证。

本研究以睡眠质量问题为调查指标,分析影响BMS患者睡眠质量的潜在因素,这有助于早期发现和干预,防止病情慢性化。

本研究也存在一定局限性。影响睡眠质量的因素非常复杂,本研究对可能影响受试者睡眠质量的潜在因素缺乏系统性和全面性的调查,包括睡眠、饮食和身体活动等相关生活习惯,以及与BMS特异性相关的症状和其他可能影响睡眠的疾病(如呼吸系统疾病或内分泌疾病)等。

未来的研究应当采用更全面的调查方法,考虑更多潜在影响因素,以提供更准确的分析。此外,深入探讨睡眠干预措施在改善BMS患者睡眠质量和整体健康状况方面的有效性,将有助于为临床实践提供指导,改善患者的生活质量。

【Author contributions】 Lu CH performed the research, analyzed the data and wrote the article. Yang CL collected the data. Zhou X and Jiang XX directed the data collection and analysis. Tang GY conceptualized and reviewed the article. All authors read and approved the final manuscript as submitted.

参考文献

[1] Jääskeläinen SK, Woda A. Burning mouth syndrome[J]. Cephalalgia, 2017, 37(7): 627-647. doi: 10.1177/0333102417694883.

[2] 中华口腔医学会口腔黏膜病专业委员会, 中华口腔医学会中西医结合专业委员会. 灼口综合征临床实践循证指南[J]. 中华口腔医学杂志, 2021, 56(5): 458-467. doi: 10.3760/cma.j.

- cn112144-20200831-00486.
- Society of Oral Medicine of the Chinese Stomatological Association; Chinese Stomatological Association of the Chinese Stomatological Association. Evidence-based clinical practice guidelines for burning mouth syndrome[J]. *Chin J Stomatol*, 2021, 56(5): 458-467. doi: 10.3760/cma.j.cn112144-20200831-00486.
- [3] 卢成辉, 罗文海, 李欣, 等. 灼口综合征多学科综合治疗进展[J]. *口腔疾病防治*, 2023, 31(4): 290-294. doi: 10.12016/j.issn.2096-1456.2023.04.011.
 - Lu CH, Luo WH, Li X, et al. Advances in comprehensive multidisciplinary treatment for burning mouth syndrome[J]. *J Prev Treat Stomatol Dis*, 2023, 31(4): 290-294. doi: 10.12016/j.issn.2096-1456.2023.04.011.
 - [4] Adamo D, Calabria E, Canfora F, et al. Burning mouth syndrome: analysis of diagnostic delay in 500 patients[J]. *Oral Dis*, 2024, 30(3): 1543-1554. doi: 10.1111/odi.14553.
 - [5] Leuci S, Coppola N, Adamo D, et al. Sexual desire, mood disorders and sleep disturbances in female BMS patients: a controlled study[J]. *J Oral Pathol Med*, 2023, 52(3): 276-282. doi: 10.1111/jop.13362.
 - [6] Zhou F, Li S, Xu H. Insomnia, sleep duration, and risk of anxiety: a two-sample Mendelian randomization study[J]. *J Psychiatr Res*, 2022, 155: 219-225. doi: 10.1016/j.jpsychires.2022.08.012.
 - [7] Haack M, Simpson N, Sethna N, et al. Sleep deficiency and chronic pain: potential underlying mechanisms and clinical implications[J]. *Neuropsychopharmacology*, 2020, 45(1): 205-216. doi: 10.1038/s41386-019-0439-z.
 - [8] Li MT, Robinson CL, Ruan QZ, et al. The influence of sleep disturbance on chronic pain[J]. *Curr Pain Headache Rep*, 2022, 26(10): 795-804. doi: 10.1007/s11916-022-01074-2.
 - [9] Jain SV, Panjeton GD, Martins YC. Relationship between sleep disturbances and chronic pain: a narrative review[J]. *Clin Pract*, 2024, 14(6): 2650-2660. doi: 10.3390/clinpract14060209.
 - [10] Amiri S, Behnezhad S. Sleep disturbances and physical impairment: a systematic review and meta-analysis[J]. *Phys Occup Ther Geriatr*, 2021, 39(3): 258-281. doi: 10.1080/02703181.2021.1871699.
 - [11] Alhendi F, Ko E, Graham L, et al. The association of sleep disturbances with burning mouth syndrome: an overlooked relationship-a qualitative systematic review[J]. *Oral Dis*, 2023, 29(1): 6-20. doi: 10.1111/odi.14051.
 - [12] Magne H. Effect of eye movement desensitization and reprocessing therapy in a patient with anxiety and burning mouth syndrome[J]. *Gerodontology*, 2024, 41(3): 433-435. doi: 10.1111/ger.12738.
 - [13] Adamo D, Sardella A, Varoni E, et al. The association between burning mouth syndrome and sleep disturbance: a case-control multicentre study[J]. *Oral Dis*, 2018, 24(4): 638-649. doi: 10.1111/odi.12807.
 - [14] Dugan C, Popescu BO, Țovaru S, et al. Neuropsychological assessment of Romanian burning mouth syndrome patients: stress, depression, sleep disturbance, and verbal fluency impairments[J]. *Front Psychol*, 2023, 14: 1176147. doi: 10.3389/fpsyg.2023.1176147.
 - [15] Raina SK. Age and sex matching in case-control studies[J]. *Neuro India*, 2015, 63(6): 1005-1006. doi: 10.4103/0028-3886.170110.
 - [16] International classification of orofacial pain, 1st edition (ICOP)[J]. *Cephalalgia*, 2020, 40(2): 129-221. doi: 10.1177/0333102419893823.
 - [17] Currie CC, Ohrbach R, De Leeuw R, et al. Developing a research diagnostic criteria for burning mouth syndrome: results from an international delphi process[J]. *J Oral Rehabil*, 2021, 48(3): 308-331. doi: 10.1111/joor.13123.
 - [18] Chen Y, Zhang B. Latent classes of sleep quality and related predictors in older adults: a person-centered approach[J]. *Arch Gerontol Geriatr*, 2022, 102: 104736. doi: 10.1016/j.archger.2022.104736.
 - [19] Euasobhon P, Atisook R, Bumrungratadum K, et al. Reliability and responsivity of pain intensity scales in individuals with chronic pain[J]. *Pain*, 2022, 163(12): e1184-e1191. doi: 10.1097/j.pain.0000000000002692.
 - [20] Tomitaka S, Furukawa TA. The GAD-7 and the PHQ-8 exhibit the same mathematical pattern of item responses in the general population: analysis of data from the national health interview survey [J]. *BMC Psychol*, 2021, 9(1): 149. doi: 10.1186/s40359-021-00657-9.
 - [21] Pranckeviciene A, Saudargiene A, Gecaite-Stonciene J, et al. Validation of the patient health questionnaire-9 and the generalized anxiety disorder-7 in Lithuanian student sample[J]. *PLoS One*, 2022, 17(1): e0263027. doi: 10.1371/journal.pone.0263027.
 - [22] Avilez-Aviles JJ, Medina-Flores MF, Gómez-Gonzalez B. Sleep loss impairs blood-brain barrier function: cellular and molecular mechanisms[J]. *Vitam Horm*, 2024, 126: 77-96. doi: 10.1016/bs.vh.2024.02.003.
 - [23] Agorastos A, Olff M. Sleep, circadian system and traumatic stress [J]. *Eur J Psychotraumatol*, 2021, 12(1): 1956746. doi: 10.1080/20008198.2021.1956746.
 - [24] Wu YH, He WB, Gao YY, et al. Effects of traditional Chinese exercises and general aerobic exercises on older adults with sleep disorders: a systematic review and meta-analysis[J]. *J Integr Med*, 2021, 19(6): 493-502. doi: 10.1016/j.joim.2021.09.007.
 - [25] Wang X, Wang R, Zhang D. Bidirectional associations between sleep quality/duration and multimorbidity in middle-aged and older people Chinese adults: a longitudinal study[J]. *BMC Public Health*, 2024, 24(1): 708. doi: 10.1186/s12889-024-17954-8.
 - [26] Rezazadeh F, Farahmand F, Hosseinpour H, et al. The association between emotional stress, sleep disturbance, depression, and burning mouth syndrome[J]. *Biomed Res Int*, 2021, 2021: 5555316. doi: 10.1155/2021/5555316.
 - [27] Xiao S, Shi L, Xue Y, et al. The relationship between activities of daily living and psychological distress among Chinese older adults: a serial multiple mediation model[J]. *J Affect Disord*, 2022, 300: 462-468. doi: 10.1016/j.jad.2021.12.069.
 - [28] Vincent BM, Johnson N, Tomkinson GR, et al. Sleeping time is associated with functional limitations in a national sample of older Americans[J]. *Aging Clin Exp Res*, 2021, 33(1): 175-182. doi: 10.1007/s40520-020-01524-0.
 - [29] Lopez-Jornet P, Lucero-Berdugo M, Castillo-Felipe C, et al. Assessment of self-reported sleep disturbance and psychological sta-

- tus in patients with burning mouth syndrome[J]. *J Eur Acad Dermatol Venereol*, 2015, 29(7): 1285-1290. doi: 10.1111/jdv.12795.
- [30] Valenzuela PL, Santos-Lozano A, Torres-Barrón A, et al. Poor self-reported sleep is associated with risk factors for cardiovascular disease: a cross-sectional analysis in half a million adults[J]. *Eur J Clin Invest*, 2022, 52(5): e13738. doi: 10.1111/eci.13738.
- [31] Amiri S, Hasani J, Satkin M. Effect of exercise training on improving sleep disturbances: a systematic review and meta-analysis of randomized control trials[J]. *Sleep Med*, 2021, 84: 205-218. doi: 10.1016/j.sleep.2021.05.013.
- [32] Mukherjee U, Sehar U, Brownell M, et al. Mechanisms, consequences and role of interventions for sleep deprivation: focus on mild cognitive impairment and Alzheimer's disease in elderly[J]. *Ageing Res Rev*, 2024, 100: 102457. doi: 10.1016/j.arr.2024.102457.
- [33] Lee YD, Chon SM. Burning mouth syndrome in postmenopausal women with self-reported sleep problems[J]. *Cranio*, 2020, 38(4): 221-232. doi: 10.1080/08869634.2018.1512549.
- [34] Baranwal N, Yu PK, Siegel NS. Sleep physiology, pathophysiology, and sleep hygiene[J]. *Prog Cardiovasc Dis*, 2023, 77: 59-69. doi: 10.1016/j.pcad.2023.02.005.
- [35] Menezes-Júnior LA, de Moura SS, Miranda AG, et al. Sedentary behavior is associated with poor sleep quality during the COVID-19 pandemic, and physical activity mitigates its adverse effects[J]. *BMC Public Health*, 2023, 23(1): 1116. doi: 10.1186/s12889-023-16041-8.
- [36] Denison HJ, Jameson KA, Sayer AA, et al. Poor sleep quality and physical performance in older adults[J]. *Sleep Health*, 2021, 7(2): 205-211. doi: 10.1016/j.sleh.2020.10.002.
- [37] da Estrela C, McGrath J, Booij L, et al. Heart rate variability, sleep quality, and depression in the context of chronic stress[J]. *Ann Behav Med*, 2021, 55(2): 155 - 164. doi: 10.1093/abm/kaaa039.
- [38] Gurvits GE, Tan A. Burning mouth syndrome[J]. *World J Gastroenterol*, 2013, 19(5): 665. doi: 10.3748/wjg.v19.i5.665.
- [39] Dinan JE, Hargitai IA, Watson N, et al. Pain catastrophising in the oro-facial pain population[J]. *J Oral Rehabil*, 2021, 48(6): 643 - 653. doi: 10.1111/joor.13166.
- [40] Kim JY, Kim YS, Ko I, et al. Association between burning mouth syndrome and the development of depression, anxiety, dementia, and parkinson disease[J]. *JAMA Otolaryngol Head Neck Surg*, 2020, 146(6): 561-569. doi: 10.1001/jamaoto.2020.0526.
- [41] Kim MJ, Kho HS. Understanding of burning mouth syndrome based on psychological aspects[J]. *Chin J Dent Res*, 2018, 21(1): 9 -19. doi: 10.3290/j.cjdr.a39914.
- [42] Zhang C, Xiao S, Lin H, et al. The association between sleep quality and psychological distress among older Chinese adults: a moderated mediation model[J]. *BMC Geriatr*, 2022, 22(1): 35. doi: 10.1186/s12877-021-02711-y.
- [43] Meneo D, Samea F, Tahmasian M, et al. The emotional component of insomnia disorder: a focus on emotion regulation and affect dynamics in relation to sleep quality and insomnia[J]. *J Sleep Res*, 2023, 32(6): e13983. doi: 10.1111/jsr.13983.

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