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A Case Series of Burning Mouth Syndrome Treated with Stellate Ganglion Near-Infrared Irradiation: Assessment of Health-Related Quality of Life Based on the Japanese Version of the MOS 36-Item Short-Form Health Survey Version 2

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Abstract: *This is the first case report of patients with burning mouth syndrome (BMS), who underwent treatment with stellate ganglion near-infrared irradiation (SGR) and an assessment of health-related quality of life (HRQoL) based on the Japanese version of the MOS 36-item short-form health survey version 2 (SF-36v2). BMS is characterized by oral burning and painful sensations with a normal clinical appearance; its real cause is still unknown. Recently, the relationships between BMS and the function of the autonomic nervous system have been pointed out; SGR has been reported to be beneficial in BMS patients. The Japanese SF-36v2 was designed to assess HRQoL for medical outcome study. The aim of this study is to assess HRQoL outcomes of SGR by using the Japanese SF-36v2. Five BMS patients received SGR. Evaluation of SGR response by visual analogue scale and assessment of HRQoL by the Japanese SF-36v2 were carried out. BMS patients had a positive response to SGR and yielded higher scores in almost all domains of the Japanese SF-36v2. Pathological conditions of BMS patients were considered to be complicated by physical and mental factors; psychosocial supports are needed for their care in addition to physical supports such as pain control.*

Keywords: *Burning mouth syndrome, Health-related quality of life, MOS 36-item short-form health survey version 2, Stellate ganglion near-infrared irradiation*

I. Introduction

Burning mouth syndrome (BMS) is characterized by oral burning and painful sensations with a normal clinical appearance of the oral mucosa involving the tongue, lip, and palate [1-7]. The real cause of BMS is still unknown; potential factors related to BMS are considered to be aging, postmenopausal climacteric disorders, oral dryness, vitamin deficiency, anemia, drugs, and psychosocial disorders [8]. Recently, the relationships between BMS and the function of the autonomic nervous system (ANS) have also been pointed out [9-11]; stellate ganglion near-infrared irradiation (SGR), which is considered to correct abnormalities in the ANS, has been reported to be beneficial in BMS patients [9,10,12].

The MOS 36-item short-form health survey version 2 (SF-36v2) was designed to assess health-related quality of life (HRQoL) for medical outcome studies [13], and is a generic questionnaire with 36 items consisting of 8 domains: physical health (RP), bodily pain (BP), general health perceptions (GH), vitality (VT), social functioning (SF), role limitations due to emotional health (RE), and mental health (MH). Furthermore, all scores from the 8 domains are summarized into 2 subscores: a physical component score (PCS) and mental component score (MCS) [13,14]. SF-36v2 has been translated from English into other languages according to the International Quality of Life Assessment (IQOLA) protocol [15,16]; the validity of the Japanese version of SF-36v2 has been verified as a measure of HRQoL [17].

The aim of this study was to assess HRQoL outcomes of SGR by using the Japanese SF-36v2.

II. Case Report

Case 1

The patient was a 51-year-old Japanese female who attended the Department of Oral Medicine, Tokushima University Hospital because of spontaneous glossalgia. She was diagnosis with BMS according to the following criteria: 1) presence of pain or a burning sensation on the surface of the tongue; 2) absence of local or systemic disease related to the above tongue symptoms, such as candidiasis, xerostomia, glossitis,

anemia, neuralgia, diabetes mellitus, and referred pain from dentalgia; 3) absence of somatization of a psychiatric disorder; and 4) absence of pain medication [18]. She received high-wattage pulsed SGR (SUPER LIZER PX Type 2; Tokyo Iken Co. Ltd., Tokyo, Japan) under the following conditions: power of 5.0 W, pulse width of 3 ms, interpulse period of 7 ms, duration of 3 min, and once a week for 10 weeks. The response to SGR was evaluated by a visual analogue scale (VAS: 0-100 mm) representing glossalgia intensity before and after SGR [19]. Self-administered questionnaires of the Japanese SF-36v2 were carried out before and after SGR. The values of VAS and PF decreased from 64 mm to 4 mm and 57.8 to 54.2, respectively (Table 1, Figure 1). The values of RP, VT, MH, PCS, and MCS increased from 29.1 to 55.7, 33.8 to 43.4, 38.4 to 54.5, 51.4 to 57.2, 41.5 to 47.8, respectively (Table 1, Figure 2, 3).

Case 2

The patient was a 76-year-old Japanese female who attended our hospital because of spontaneous glossalgia, tongue numbness, intraoral sticky feeling, dry mouth feeling, and amblygeustia. She was on medication for hypertension. She was diagnosed with BMS according to the same criteria as case 1 and received high-wattage pulsed SGR under the same conditions as case 1. Evaluation of SGR response by VAS and assessment of HRQoL by the Japanese SF-36v2 were carried out as with case 1. The value of VAS decreased from 51 mm to 7 mm (Table 1, Figure 1). The values of PF, RP, BP, GH, VT, SF, RE, MH, PCS, and MCS increased from 39.8 to 50.6, 29.1 to 42.4, 40.3 to 50.1, 35.1 to 44.2, 37.0 to 53.0, 37.7 to 44.1, 31.1 to 43.6, 43.8 to 46.5, 31.0 to 44.4, 42.7 to 49.3, respectively (Table 1, Figure 2, 3).

Case 3

The patient was a 70-year-old Japanese female attending our hospital because of spontaneous and induced glossalgia, oral burning sensation, and dry mouth feeling. She was on medication for hypercholesterolemia and chronic gastritis. She was diagnosed with BMS and received high-wattage pulsed SGR like the above cases. Evaluation of SGR response by VAS and assessment of HRQoL by the Japanese SF-36v2 were carried out as with the above cases. The value of VAS decreased from 55 mm to 18 mm (Table 1, Figure 1). The values of PF, RP, BP, GH, VT, SF, RE, MH, PCS, and MCS increased from 36.2 to 54.2, 12.5 to 55.7, 26.9 to 54.6, 51.1 to 57.5, 30.6 to 65.9, 18.4 to 57.0, 14.4 to 56.1, 27.7 to 65.2, 17.6 to 50.9, 37.1 to 64.8, respectively (Table 1, Figure 2, 3).

Case 4

The patient was a 63-year-old Japanese female attending our hospital because of spontaneous and induced glossalgia. She was diagnosed with BMS and received high-wattage pulsed SGR like the above cases. Evaluation of SGR response by VAS and assessment of HRQoL by the Japanese SF-36v2 were carried out as with the above cases. The values of VAS and PCS decreased from 73 mm to 24 mm and 63.4 to 58.5, respectively (Table 1, Figure 1, 2). The values of PF, BP, VT, SF, RE, MH, PCS, and MCS increased from 53.8 to 54.2, 35.8 to 44.3, 30.6 to 43.4, 44.1 to 57.0, 27.7 to 46.5, 25.6 to 42.7, respectively (Table 1, Figure 3).

Case 5

The patient was a 39-year-old Japanese female attending our hospital because of spontaneous and induced glossalgia, oral burning sensation, and sore throat. She was diagnosed with BMS and received high-wattage pulsed SGR like the above cases. Evaluation of SGR response by VAS and assessment of HRQoL by the Japanese SF-36v2 were carried out as with the above cases. The values of VAS, PF, and RE decreased from 83 mm to 33 mm, 57.8 to 54.2, 56.1 to 51.9, respectively (Table 1, Figure 1). The values of RP, BP, GH, VT, SF, MH, PCS, and MCS increased from 35.8 to 49.1, 31.4 to 39.8, 37.8 to 44.2, 46.6 to 53.0, 50.6 to 57.0, 43.8 to 46.5, 48.1 to 51.4, 42.1 to 47.7, respectively (Table 1, Figure 2, 3).

This study was approved by the Institutional Review Board and Medical Ethics Committee of Tokushima University Hospital. All patients provided their informed consent after a full explanation of all procedures.

III. Discussion

To our knowledge, this is the first case report of BMS patients who underwent treatment with SGR and an assessment of HRQoL based on the Japanese SF-36v2. BMS patients had a positive response to SGR and yielded higher scores in almost all domains of the Japanese SF-36v2 (Table 1, Figure 1-3).

Each domain of the Japanese SF-36v2 is scored using norm-based methods that standardize the scores to a mean ± standard deviation of 50 ± 10 on national average (2007), with higher scores indicating better health [13,14]. PF, RP, and BP are expected to be highly correlated with physical health; MH, RE, and SF with mental health [17]. BMS patients were reported to have a diminished HRQoL [20-22]. In this study, BMS patients initially had poorer HRQoL scores in almost all domains of the Japanese SF-36v2 than the national norms

(Figure 1-3). BMS patients have a high disease burden compared to the general population; some of them show anxiety, depression, cancerphobia, and personality disorders [23,24]. Thus, BMS symptoms can exert negative impacts on the HRQoL of BMS patients [20-22,24,25]. Based on the HRQoL outcomes of SGR using the Japanese SF-36v2, the pathological conditions of BMS patients were considered to have been complicated by physical and mental factors; thus, psychosocial supports should be required for their care in addition to physical supports such as pain control. Fortunately, the relieving effect of SGR as measured by VAS almost paralleled the improvement in HRQoL as measured by Japanese SF-36v2. Continuous collection of data and further investigation are needed to confirm these findings.

Table 1 VAS scores and summary scores of the Japanese SF-36v2 before and after SGR

Case No.	VAS (mm)		PCS		MCS	
	Before SGR	After SGR	Before SGR	After SGR	Before SGR	After SGR
1	64	4	51.4	57.2	41.5	47.8
2	51	7	31.0	44.4	42.7	49.3
3	55	18	17.6	50.9	37.1	64.8
4	73	24	63.4	58.5	25.6	42.7
5	83	33	48.1	51.4	42.1	47.7

VAS, visual analogue scale; PCS, physical component score; MCS, mental component score; SGR, stellate ganglion near-infrared irradiation.

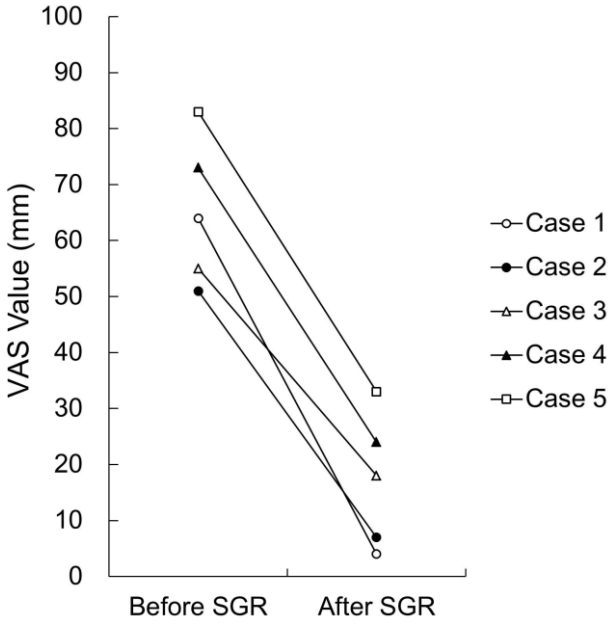

Figure 1 Time course of VAS values.

VAS, visual analogue scale**.**

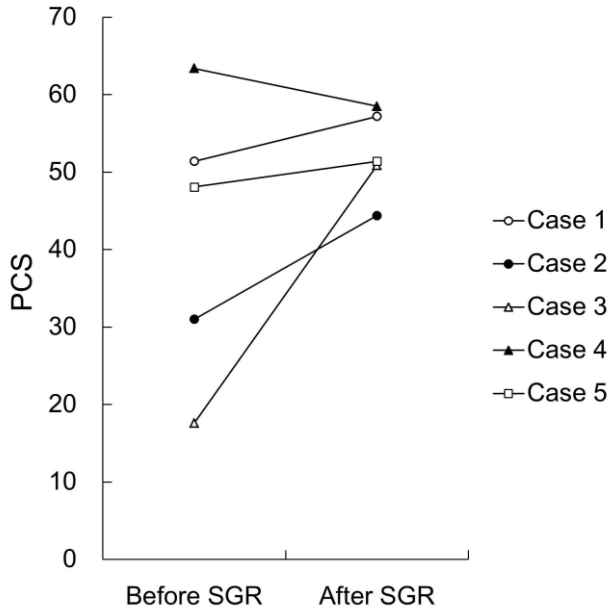

Figure 2 Time course of PCS values.

PCS, physical component summary.

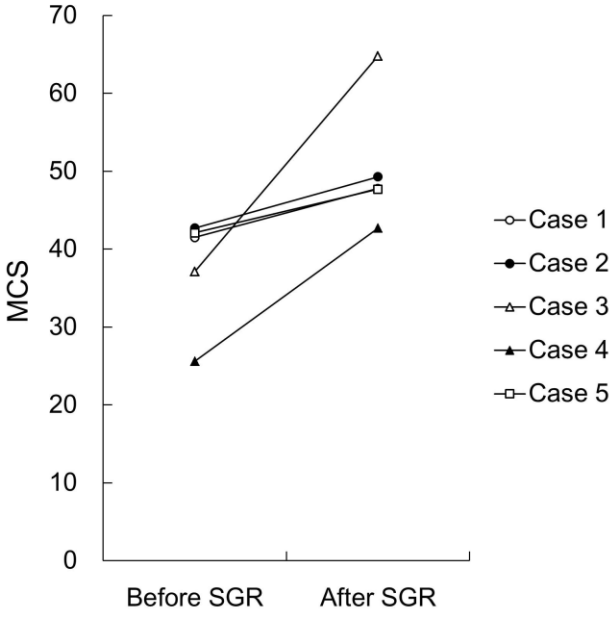

Figure 3 Time course of MCS values.

MCS, mental component summary.

IV. Conclusion

We experienced the cases of BMS patients who underwent treatment with SGR and an assessment of HRQoL based on the Japanese SF-36v2. BMS patients had a positive response to SGR and yielded higher scores in almost all domains of the Japanese SF-36v2. Pathological conditions of BMS patients were considered to be complicated by physical and mental factors; psychosocial supports are needed for their care in addition to physical supports such as pain control.

Conflict of interest statement

None of the authors has a conflict of interest.

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