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# On characteristics of Burning Mouth Syndrome patients

## A study based on clinical and salivary parameters

Akademisk avhandling

Som för avläggande av odontologie doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i Hörsal Arvid Carlsson, Medicinaregatan 3, fredagen den 7 september 2018, klockan 13.00

av

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**Avhandlingen baseras på följande delarbeten**

I. Acharya S, Carlén A, Wenneberg B, Jontell M, Hägglin C. Clinical characterization of women with burning mouth syndrome in a case-control study. *Acta Odontologica Scandinavica*. 2018; 76: 279-286.

II. Acharya S, Hägglin C, Jontell M, Wenneberg B, Ekström J, Carlén A. Saliva on the oral mucosa and whole saliva in women diagnosed with burning mouth syndrome. *Oral Dis*. 2018; 00:1-9. https://doi.org/10.1111/odi.12918.

III. Acharya S, Chunsheng J, Jontell M, Carlén A, Bylund J, Karlsson NG. Reduced Sialyl-Lewis$^x$ in burning mouth syndrome patients. *Manuscript*.

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# On characteristics of Burning Mouth Syndrome patients

## A study based on clinical and salivary parameters

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## Abstract

Burning Mouth Syndrome (BMS) is a condition with unknown aetiology that is characterised by a chronic unremitting burning sensation in the oral mucosa. This condition, which affects mainly middle-aged and older women, presents major challenges to the patients, physicians, and researchers. The lack of both, objective diagnostic criteria and effective treatment strategies renders difficulties in the management of patients suffering from BMS. The aims of this thesis were to: characterise the clinical symptoms and associated factors described by the patients; compare the whole saliva and saliva on the oral mucosa; and compare the salivary components in the patients with BMS and in age- and sex-matched controls. In **Paper I** it was found that 37% of the patients with BMS reported to have a combination of burning and scalding sensation as the most common BMS symptom and 45% patients reported to sense taste disturbances. The mean severity of the BMS symptoms experienced by the patients, measured on a visual analogue scale (VAS, 0-100) was 66. The patients with BMS expressed lower levels of satisfaction with their general and oral health, life-situation and reported more medications, diseases/disorders, xerostomia, allergy, skin diseases, bruxofacets, and less amalgam fillings than did the controls. Multiple logistic regression analysis, however, revealed that xerostomia and skin diseases had strongest association to BMS. In **Paper II** we compared whole saliva and oral mucosal saliva along with the effects of medication on the salivary flow-rate and xerostomia in patients with BMS and in controls. It was found that BMS associated diseases/disorders and drug usage coincided with less saliva on the tongue and less whole saliva. Systemic diseases and medication usage, however, did not have a significant impact on xerostomia in patients with BMS. The effect of glycosylation of the salivary mucin MUC7 and the presence of inflammatory markers in patients with BMS and controls were examined in **Paper III**. Overall, the types of oligosaccharides found on MUC7 in BMS patients and controls were similar. However, quantitative analysis of the individual oligosaccharides showed lower levels of sialylated and fucosylated structures, especially Sialyl-Lewis$^x$, in the patients with BMS. Analysis of inflammatory markers showed that patients with BMS represented a more heterogeneous group than the controls. This lead us to draw the conclusion that for some patients with BMS like symptoms, low-grade inflammation may be a contributing factor. This expands our knowledge of the clinical and salivary parameters associated with BMS. These studies are part of a larger project to design a disease model for BMS that would facilitate the diagnosis and treatment of patients with BMS in the future.

**Keywords**: Burning Mouth Syndrome, Parafunction, Skin diseases, Saliva, Drugs, Xerostomia, Mucins, MUC7, Sialyl-Lewis$^x$.

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