

Summary of: Reduction in unstimulated salivary flow rate in burning mouth syndrome

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FULL PAPER DETAILS

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Background Burning mouth syndrome (BMS) is a chronic condition of burning of the tongue and oral mucosa. It is often accompanied with complaints of xerostomia, although it is unknown whether the dryness is a sensory change similar to the burning sensation or due to hyposalivation. To determine whether there is change in salivary flow rate, whole salivary flows were measured in BMS patients. **Methods** A clinical ambispective study was conducted. Patients' clinical files were reviewed for stimulated and unstimulated whole salivary flow. Patients were divided into four groups based on diagnosis into Sjögren's syndrome (SS), BMS, BMS taking oral drying medications (BMS-med), and control (C). Whole stimulated (SF) and unstimulated flow (USF) measurements were collected and compared among groups. Data were analysed with ANOVA, Levene's test, Tukey's test and Games-Howell test. **Results** Twenty SS, 22 BMS, 24 BMS-med and 15 C were included in the study. SF was significantly lower in SS ($0.59 \text{ ml} \pm 0.36$) compared with BMS ($1.56 \text{ ml} \pm 0.65$, $p < 0.001$), BMS-med ($1.44 \text{ ml} \pm 0.64$, $p < 0.001$) and C ($2.32 \text{ ml} \pm 1.06$, $p = 0.001$). USF was significantly lower in SS ($0.12 \text{ ml} \pm 0.10$) compared with BMS ($0.30 \text{ ml} \pm 0.18$, $p = 0.002$), BMS-med ($0.27 \text{ ml} \pm 0.21$, $p = 0.022$) and C ($0.52 \text{ ml} \pm 0.26$, $p < 0.001$). SF was not significantly different between BMS and C ($p = 0.172$) and BMS-med and C ($p = 0.096$). Both BMS and BMS-med had significantly lower USF compared with C ($p = 0.040$ and $p = 0.018$ respectively). SF in BMS was not significantly affected by number of oral drying medications ($p = 0.254$); however, USF was significantly lower with two or more oral drying medications ($0.13 \text{ ml} \pm 0.07$) compared with one oral drying medication ($0.32 \text{ ml} \pm 0.22$) ($p = 0.034$). **Conclusion** BMS patients have statistically significant decreased unstimulated salivary flow rate with non-statistically significant decreased stimulated flow rate. Salivary flow rates in BMS patients are decreased further by medication usage whose side effects include dry mouth. This suggests that hyposalivation may play a role in causing dry mouth in BMS, which may respond to treatment with a sialogogue.

EDITOR'S SUMMARY

Colloquially and somewhat dismissively referred to as either spit or dribble, I have long thought that saliva is one of the most underrated of bodily fluids. Having written that, from the viewpoint of operative dentistry it is something of a nuisance in its capacity to flow into all the places that you don't want it to go. But we will let that pass just now.

There has been much research on saliva in recent years: its constituents, its healing properties and its possible uses as a diagnostic tool. Indeed a lot of product development investment was made some years ago and the humble secretion looked as if it was poised to make major inroads into diagnostic health and medicine. Some of that development has come to pass and I suspect that in due course the value of this approach will gain greater currency partly because of its ease of non-invasive collection. We have seen this in practice in the collection and analysis of salivary bacteria in relation to

caries prediction and progression as well as its capacity to remineralise pre-carious lesions. Refining and harnessing this technology still holds great promise.

While one diagnostic aspect which mitigates against this is when the flow of saliva is low this in itself may provide further clues to oral and general health. This research exemplifies my favourite statement in authors' starting points as they state 'Clinically a pattern was noted: patients with Sjögren's syndrome had decreased unstimulated and stimulated salivary flow. However, patients with burning mouth syndrome (BMS) had normal stimulated flows but below normal unstimulated flows.' Observation prompting curiosity and creating the opportunity for the exploration of its causes.

Interestingly, the enquiry has led to the conclusion that BMS patients have statistically significantly decreased unstimulated salivary flow rate with non-statistically significantly decreased stimulated flow rate.

This in turn has stirred further thoughts that low unstimulated flow may be secondary to changes in autonomic function, which is itself an extended area of research which may ultimately serve to benefit patients with both xerostomia and BMS.

Another practical and important point arising from this paper, and the accompanying Commentary, is that so few of us as clinicians regularly measure salivary flow rates in our patients. As background information this provides valuable baseline data from which subsequent measures can be compared and is something that we may consider valuable given the ageing populations that we increasingly examine and treat.

The full paper can be accessed from the *BDJ* website (www.bdj.co.uk), under 'Research' in the table of contents for Volume 217 issue 7.

Stephen Hancocks

Editor-in-Chief

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IN BRIEF

- Enhances the diagnosis of burning mouth syndrome (BMS).
- Differentiates between BMS and Sjögren's patients.
- Has the potential to become a very simple tool for clinical diagnosis for BMS.
- Suggests that one of the aetiologies of BMS relates to autonomic nervous system dysfunction.

COMMENTARY

A major problem in carrying out studies on the effects of different diseases on salivary flow rates is the very wide range of normal values. Typically, in any group of individuals, the standard deviation for salivary flow rate is a very high fraction of the mean, as seen in Tables 1 and 2 of this article by Grushka and colleagues. Large numbers of subjects are required in order to show significant differences among groups, since the variance decreases only as the square root of the number of subjects. In Dr Grushka's study these numbers, especially the controls (15), are actually quite low for determining whether patients with burning mouth syndrome (BMS) have reduced salivary flow rates, but this is understandable for the BMS patients, who were all from her oral medicine practice.

Hyposalivation is usually considered to be present when the unstimulated salivary flow rate (USF) is $<0.1 \text{ mL/min}^1$ and, surprisingly, none of the mean values in Table 1 is less than this, even in the patients with Sjögren's syndrome. However, xerostomia (the subjective symptom of dry mouth) has been reported in patients with salivary flow rates in the normal range.² Without having data on the USF of Dr Grushka's patients before they developed BMS, it is not possible to tell whether their USFs have decreased since they developed BMS or whether their USF was low before the onset of BMS. In other words, they may always have had relatively low salivary flow rates!

In medical practice it is common to maintain records of a patient's blood pressure etc, beginning with the patient's first visit. Unfortunately, it is probably only in Sweden where the

missing data for a study like Dr Grushka's would be available, since dentists there are apparently routinely taught to measure each patient's salivary flow rates at their first visit and periodically thereafter. Such baseline data are invaluable if the patient subsequently complains of xerostomia. One hopes that the dental profession in other countries will soon institute salivary flow rate measurements, which take little time and can be delegated to auxiliary personnel.

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2. Fox P C, Busch K A, Baum B J. Subjective reports of xerostomia and objective measures of salivary gland performance. *J Am Dent Assoc* 1987; **115**: 581–584.

AUTHOR QUESTIONS AND ANSWERS**1. Why did you undertake this research?**

Salivary flows are taken as a preliminary test for every patient that presents with dry mouth, burning mouth pain or Sjögren's syndrome. Clinically, a pattern was noted: patients with Sjögren's syndrome had decreased unstimulated and stimulated salivary flow. However, patients with burning mouth syndrome (BMS) had normal stimulated flows but below normal unstimulated flows. We were interested in finding if there were significant differences between the salivary flows in these two patient populations that often report dry mouth, which led us to investigate whether a simple salivary flow test could differentiate between BMS and Sjögren's syndrome.

2. What would you like to do next in this area to follow on from this work?

The pattern that is seen consistently in the BMS patient population (ie normal stimulated and low unstimulated flows) indicates that salivary flow rate measurement may be useful as a clinical diagnostic tool. It would also be of interest to determine if there is any change in salivary flows even after BMS patients are effectively treated with medication, such as low-dose clonazepam, which is helpful for BMS. In some cases, after clonazepam is introduced to a patient, complaints of dry mouth may still require medications to increase saliva (eg Salagen) suggesting that low unstimulated flow may be secondary to changes in autonomic function.