

# Cerebral activation during thermal stimulation of patients who have burning mouth disorder: an fMRI study.

[Albuquerque RJ](#)<sup>1</sup>, [de Leeuw R](#), [Carlson CR](#), [Okeson JP](#), [Miller CS](#), [Andersen AH](#).

## Author information

### **Abstract**

The pathophysiology of burning mouth disorder (BMD) is not clearly understood, but central neuropathic mechanisms are thought to be involved. The aim of this study was to gain insight into the pathophysiology associated with BMD by using functional magnetic resonance imaging (fMRI). Areas of brain activation following thermal stimulation of the trigeminal nerve of eight female patients with BMD (mean age 49.1+/-10.1) were mapped using fMRI and compared with those of eight matched pain-free volunteers (mean age 50.3+/-12.3). Qualitative and quantitative differences in brain activation patterns between the two study groups were demonstrated. BMD patients displayed greater fractional signal changes in the right anterior cingulate cortex (BA 32/24) and bilateral precuneus than did controls ( $p<0.005$ ). The control group showed larger fractional signal changes in the bilateral thalamus, right middle frontal gyrus, right pre-central gyrus, left lingual gyrus, and cerebellum than did the BMD patients ( $p<0.005$ ). In addition, BMD patients had less volumetric activation throughout the entire brain compared to the control group. Overall, BMD patients displayed brain activation patterns similar to those of patients with other neuropathic pain conditions and appear to process thermal painful stimulation to the trigeminal nerve qualitatively and quantitatively different than pain-free individuals. These findings suggest that brain hypoactivity may be an important feature in the pathophysiology of BMD.

### **Comment in**

- [BMD, fMRI study and brain hypoactivity](#). [Pain. 2007]
- [Burning questions about the brain in pain](#). [Pain. 2006]