Chewing gum side-preference test correlates with asymmetry in masseter muscles volumes

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Several studies demonstrated the involvement of GABA and reactive oxygen species (ROS) in trigeminal pain transmission; anyway, there are still poorly understood mechanisms modulating pain, resulting, for instance, in hypoalgesia in hypertensive patients. One possibility is that the activity of afferent neurons during mastication modulates ROS production in second-order sensory neurons. An ongoing research project is aimed to reveal such mechanisms in humans with fMRI; here the preliminary results of the methodological approach to show an asymmetrical mastication will be reported, demonstrating that the chewing gum side-preference test correlates with anatomical features.

Twenty healthy volunteers performed a chewing side-preference test, in which they had to chew a common chewing gum for 1 minute and 10 seconds, and smile every ten seconds, thus showing on which side they were masticating. Structural MRI scans of the heads of the same volunteers were also acquired and the borders of the masseters were manually identified in all sections to obtain the volume of the muscles from both sides. The results showed that there is a significant positive correlation between the results of the chewing gum side-preference test and the anatomical asymmetry of the masseters. This result supports the use of the chewing gum side-preference test to choose the side for an experimental treatment of the ongoing research project on ROS production during asymmetrical mastication.