Trigeminal nerve injury is one of the most distressing complications that may occur after surgery and trauma, resulting in sensory disturbances often accompanied by pain and decreased quality of life. Hence, neuropsychological changes should be recognized as early as possible to start an appropriate therapy. Therefore, we established the Quantitative Sensory Testing (QST) implemented by the German Research Network on Neuropathic Pain (DFNS) at chin, lip, gingiva and tongue and completed these neurophysiological investigations by questionnaires for pain estimation and psychiatric comorbidity.

Methods

QST is a non-invasive, psychophysiological approach to detect thermal and mechanical perception and pain thresholds in neuropathic pain. Thereby the function of large and small afferent nerve fibres will be considered, revealing hypalgesia, dysaesthesia and hyperaesthesia. QST data were evaluated for healthy subjects (n=20) and patients suffering from painful trigeminal neuropathy (n=5) at chin and lip. In case of painful sensations, thermal and mechanical hyperalgesia, allodynia and the history of pain, as well as anxiety and depression (HADS-D) were monitored and evaluated.

Results

To compare patient’s QST profiles, the QST data were normalized with healthy individuals by z-transformation (z-value = [value patient – mean reference]/standard deviation reference). In three of the five patients nerve impairment occurred due to implant surgery. The other two patients underwent surgery for dental cyst removal and tumour resection. In all patients we found numbness at chin (Fig.4) and lip (similar data, not shown), coexisting with reduced temperature perception. This is typically for deafferentation of small (Aδ- and C-) and large (Aβ-) nerve fibres. Furthermore pain sensitization with varying severity, reaching from increased mechanical pain sensitivity to obvious mechanical and/or thermal hyperalgesia could be observed. Besides this, allodynia, meaning abnormal pain experience for normally not painful stimuli and enhancement of temporal pain summation were detectable. This indicates involvement of the central nerve system. In addition, the patients showed higher anxiety and depression scores.

Conclusion

Additionally to thorough dental and oral examination, QST is a helpful tool to reveal orofacial neuropathic pain. Typically for trigeminal neuropathy is the loss of both, small and large fibre function. But patients differ obviously in their expression of painful sensations. It depends on their individual risk for central sensitization, triggered by their pain history and psychological comorbidity. Thus it is important to assess individual sensory phenotypes as exactly as possible, including self report tools. Based on the patient’s profiles, an individual mechanism based therapy could be started and controlled for efficiency.