

# Relationship between the Evaluation of Anxiety before the Impacted Third Molar Surgery and the Autonomic Nervous Activity

Yumiko MATSUDA, Mika SETO and Toshihiro KIKUTA

*Department of Oral and Maxillofacial Surgery, School of Medicine, Faculty of Medicine, Fukuoka University*

## **Abstract**

The relationship between the immediate autonomic response that occurs during local anesthesia and the preoperative anxiety level by using the State Trait Anxiety Inventory-X (STAI-X) during postural change on extraction of an impacted wisdom tooth were evaluated.

One hundred and twenty three healthy adult subjects were administered the STAI-X immediately before the extraction of impacted wisdom tooth with local anesthesia. According to STAI-X results, subjects were classified as Normal group (N group) as levels I, II and III, and High anxiety group (H group) as levels IV and V.

We conducted a modified Head-up Tilt test (m-HUT) that involved postural change from supine to sitting position with spontaneous breathing. The experimental study was commenced 15 minutes after the intravenous line was placed. The first phase of the experiment consisted of the resting state; data were collected for 5 minutes in the supine position (A) and for an additional 5 minutes after postural change to the sitting position (B). The patient was returned to the supine position (C) and during local anesthesia (D).

The recorded ECG waveform data of 123 subjects in both N group and H group were compared for autonomic nervous activity. We selected 86 subjects exhibiting normal autonomic nervous activities in postural change of B from A were selected for further analysis. And they were further classified as Normal reaction and Normal group (NN group) and Normal reaction and High anxiety group (NH group).

Power spectral analysis was conducted on the measurement point of A, B, C and D respectively. The high-frequency (HF) component represented as the cardiac sympathetic activity by the R-R interval variability. The low frequency (LF) component represented as the interaction between baroreflex responses by cardiac sympathetic and parasympathetic activity. The LF/HF ratio reflected as the dominance of the cardiac sympathetic activity was calculated.

All subjects, in postural change of B from A, showed a significant reduction in HF and a significant increase in LF/HF and HR. When converting to C from B, in the H group, HF significantly increased, LF/HF decreased, and HR reduced significantly. In the selected 86 subjects exhibited normal autonomic nervous activity in postural change of B from A, The NN group showed no significant change in HF or LF/HF, and the NH group showed a continued downward trend in both HF and LF/HF during the local anesthesia (D). The results suggest that the high anxiety group, as determined by analysis through STAI-X, tend toward an unbalanced hemodynamic condition during local anesthesia.

**Key words:** State-Trait Anxiety Inventory-X (STAI-X), modified Head-up Tilt Test (m-HUT), Normal reaction and Normal group (NN group), Normal reaction and High anxiety group (NH group)