

論 文 要 旨

Analysis of autonomic nervous system activity during dental practice

歯科診療中の自律神経活動の解析

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Screening Female Patients With Autonomic Nervous System Imbalance

Using the Toho Medical Index Before Tooth Extraction

抜歯前の東邦メディカルインデックス取得による

自律神経系の失調状態を有する女性患者のスクリーニング

Objective

Imbalanced autonomic nervous system (ANS) activity raises concerns about the development of systemic complications during dental treatment. The purpose of this study was to determine whether a psychological test (Toho Medical Index (TMI)) prior to the impacted mandibular third molar extraction can identify patients with potentially imbalanced autonomic function.

Materials and methods

In this prospective study, 34 healthy adult patients with no history of systemic disease were assigned to either the autonomic imbalance group (type II, III, IV) or the control group (type I) based on the results of the TMI. We evaluated sympathetic nervous system activity (low/high frequency (LF/HF)), parasympathetic nervous activity, heart rate (HR), and systolic blood pressure (SBP) values before extraction of the impacted mandibular third molar.

Results

LF/HF and SBP in the autonomic imbalance group were significantly higher preoperatively than those in the control group. In addition, preoperative HF values were significantly lower in the autonomic imbalance group compared to those in controls (Mann-Whitney U test, $p < 0.05$); no significant group differences in HR were found (Mann-Whitney U test, $p < 0.05$).

Conclusion

ANS activity before extraction of the impacted mandibular third molar was assessed subjectively using the TMI and objectively using HR variability analysis. Our findings suggest that some patients do not have symptoms specific to dysautonomia but have an imbalance of autonomic function before extraction of the impacted mandibular third molar, and TMI can identify such patients.

Effects of noise-canceling during dental scaling on autonomic nervous system activity

歯科スケーリング中のノイズキャンセリングが自律神経活動に与える影響

Purpose

Reducing stress from dental noise and monitoring autonomic nervous system activities are important for providing a safe dental treatment environment. The purpose of this study was to establish a treatment environment that reduces the effects of dental noise on the patient and investigate the effects of noise-canceling during dental scaling on autonomic nervous system activity.

Methods

In this prospective study, 40 patients (women aged 20–40 years) were randomly assigned to either the noise canceling group, in which noise was cancelled during dental scaling or the control group. Heart rate, heart rate variability, systolic blood pressure was recorded during the experiment, and the Modified Dental Anxiety scale and State-Trait Anxiety Inventory scores were obtained before the procedure.

Results

The high frequency (HF) in the control group was significantly reduced during mandibular scaling compared to that at rest. The HF in the noise-canceling group during mandibular scaling and at rest after completion were significantly higher than those in the control group. In the control group, the heart rate increased at rest after completion compared to that at rest. Heart rates were significantly lower in the noise-canceling group during mandibular scaling compared with those of the control group.

Conclusions

Noise-canceling during dental scaling increased parasympathetic nervous system activity, thereby lowered heart rate and contributed to stress relief.