SUMMARY

The human voice is used for verbal communication with other people. Today's lifestyle and pace of life promote the development of voice-related habits that are functionally poor. Excessive muscle tension, poor posture, harmful habits (e.g., cigarette smoking, retching), gastro - oesophageal reflux, thyroid disease, hormonal fluctuations and chronic stress can all have an adverse effect on voice function. Abnormal phonatory mechanisms with impaired phonatory – articulatory - breath coordination can contribute to multiple voice disorders. The natural ageing process involves the co-occurrence of an increasing number of chronic diseases. Some of them may have a direct or indirect effect on voice quality, e.g., as a side effect of medication. Among chronic diseases that can impair voice quality, thyroid disease is the condition that is reported most commonly.

Purpose of the Study

The aim of the study was to evaluate the effects of vibration therapy on voice emission and thyroid function in female voice professionals. The following research questions were used to achieve this objective:

1. Whether or not and how does the applied vibration therapy affect FSH, TSH, fT3, fT4 hormone levels and **C** Reactive Protein (CRP) levels in the study groups?
2. Whether or not and how does the applied vibration therapy affect mean phonation time (MPT) in the study groups?
3. Whether or not and how does the applied vibration therapy affect range of motion of the cervical spine in the study groups?
4. Whether or not and how does the applied vibration therapy affect postural stability in the study groups?
5. Whether or not and how does the applied vibration therapy affect the respiratory tract in the study groups?

Study Material and Research Methodology

The study was conducted at the Vibration Therapy Laboratory of the University of Physical Education, and Cracow University from September 2021 to November 2022. Actively working females from the following professional groups were recruited for the study: actresses, singers and teachers.

The study material consisted of 77 Caucasian females from the Lesser Poland and Subcarpathian Provinces, aged 20-50 years with diagnosed functional dysphonia. The study females were allocated to two groups: the study group and the control group.

Eligible subjects received a phoniatric evaluation. In addition, aerodynamic voice tests and (FSH, TSH, fT3, fT4) hormone level and CRP measurements were performed prior to the planned vibration therapy treatments. The therapeutic process involved a number of meetings in the vibration therapy laboratory, where the Vitberg Rehabilitation Massaging Device with Neck module (Vitberg Jacek Sikora - Nowy Sącz) was used. There were three thirty-minute treatment sessions taking place three times a week for a duration of six weeks. At the end of the therapy, the study patients were re-screened for thyroid and vocal function.

Quantitative variables were analyzed with the use of descriptive statistics, calculating the mean ($\bar{x}$), standard deviation (SD) and median (Me). The analysis of qualitative variables was performed by calculating the number and the percentage of each value.

Statistical calculations were performed with the version IBM SPSS 26.0 and Exact Tests 4.1.1 R software. A $p \leq 0.05$ was considered statistically significan.

Results

A statistically significant (p=0.000) difference in measurements was observed for fT4 levels (ng/ml*) in the study group. Analysis of results for MTP measurement in the study group showed a statistically significant (p=0.000) difference in MTP between the results obtained before and after therapy. The average MPT in the study group before therapy was 15,01 [s.] as compared to the significantly higher mean of 18,02 [s.] after therapy. The study showed the occurrence of female voice professional. The applied vibration therapy significantly affected the respiratory tract in the study groups (p=0,000).

No statistically significant difference in changes (after vs before therapy) in the load distribution and the location of foot center of pressure (COP) during static standing.

Conclusions

1. The applied vibration therapy significantly affected fT4 levels in the study group.
2. It extended mean phonation time (MPT) in the study group as compared to the control group.
3. The applied vibration therapy not significantly affected range of motion of the cervical spine in the study group.
4. The applied vibration therapy significantly affected postural stability in the study group.

5. The applied vibration therapy significantly affected the respiratory tract in the study groups.