

THE EFFECTS OF BREATHING EXERCISES ON HEART RATE VARIABILITY AND BREATHING FREQUENCY IN CANCER PATIENTS

Background

Nearly half of all patients with advanced cancer can experience symptoms such as pain, fatigue, insomnia, anxiety, depression and cognitive impairment often referred to as the symptom cluster [1,2]. An important system which influences the related symptom cluster, is the autonomic nervous system (and vagus nerve) which can be measured by means of heart rate variability (HRV). A higher HRV is a signal of good adaptation of vagus nerve activity and characterizes an efficient autonomic mechanism, whilst a lower HRV is an indicator of insufficient adaptation, which in turn might provoke poor physiological function and quality of life. The vagus nerve can be stimulated by means of invasive stimulation techniques although they often go along with side-effects. Therefore, a non-invasive stimulation technique such as deep breathing is a preferred method to increase HRV.

Aim(s)

This study aimed to examine the effects of deep breathing exercises on HRV and breathing rest rate in cancer patients by means of subjective and objective measures.

Methods

Participants in the study followed a 6 week program. All participants were assessed for the symptom cluster by means of validated questionnaires and their HRV and breathing rest rate by means of an objective HRV measurement during pretest and posttest. During the first session, participants received instructions for the breathing exercises according to a validated protocol by Lehrer et al. (2013) [3]. All participants were asked to practice these exercise at home twice daily by means of a Heart Math® visual breathing guide. During these 6 weeks, all participants took part in two follow-up interviews with one of the researchers. The multi-disciplinary research team consisted out of 2 nurses, 2 physiotherapists and 1 psychologist.

Results

In total, 21 cancer patients started the study of which 12 patients completed full assessment at pretest and posttest. The HRV measure is expressed by means of SDNN which is the standard deviation of the time interval between heart beats (NN). A minimal SDNN of 50 ms is considered normal. After following the program, the mean SDNN measures of the participants was increased from 43,55ms to 49,5ms (+14%). Breathing pace at rest is considered normal for adults when between 6-18breaths/min. After following the 6 week program, the mean breathing rest rate of the participants decreased from 11,25 breaths/min to 9,84 breaths/min (-13%).

Discussion

Although breathing exercises can be a promising method to increase HRV which in turn might improve the symptom cluster, larger sample sizes are needed to continue to examine effects of deep breathing on HRV and health outcomes in cancer patients. Furthermore, long term support for participants is needed in order for the participant to continue the breathing exercises at home after completion of the study.

Implications and future perspectives

Efforts are made to increase the current sample size although the targeted population comes along with a higher drop-out considering the higher mortality and morbidity. Second, oncology nurses are encouraged to get acquainted with breathing techniques so that patients can receive instructions and support to maintain these exercises at home.

References

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