Telemedicine and metabolic diseases

Dissertation

Mgr. Ondřej Kádě

Abstract:

In recent years, telemedicine has increasingly come to the forefront of the interest of both professionals and the general public. Covid-19 pandemic „helped" the development of telemedicine. Telemedicine started to develop rapidly and began to be used in the care of acute and chronic patients, as well as in the communication with patients and among the professionals involved. Metabolic diseases, such as obesity and diabetes, are also at the forefront of interest as their prevalence is increasing. The care of obese patients is a complex process that involves many variables, and with telemedicine, it is possible to work more effective with these variables and design appropriate interventions.

This thesis aims to analyse individual selected components of complex care for obese patients. Some of the basic parameters consulted in the treatment of obesity are body composition, using bioimpedance methods, indirect calorimetry measurements to determine the degree of adaptation to low energy intake, and the patient's level of fitness using a six-minute walking test. These parameters were evaluated and statistically processed. At the same time, there is a need to collect and analyze patient´s data. Therefore, the EDURES system was developed to collect data and concentrate it clearly in one system, while offering insight to the therapist and the possibility of communication and intervention. In the framework of telemedicine projects, a weight predictor is also being developed that should be able to predict the evolution of weight when following a set regimen, based on the data collected about the patient. Similarly, a glucose predictor for diabetics is being developed.

The results of the bioimpedance comparisons indicate significant differences between the devices and thus it is not possible to confuse the different devices when interpreting the results. When processing the indirect calorimetry results, it was found that regardless of BMI, the proportion of muscle tissue is the determining factor, with a logically higher percentage of muscle tissue predicting higher resting energy expenditure. The relationships between body composition and the results of the six-minute walk tests were investigated, as well as what effect each parameter has on predicting outcomes. All the parameters that we obtain from obese patients, which help to provide better and more effective care, can be recorded in the EDURES telemedicine system. The care of metabolic patients is a relatively complex process and telemedicine can make it easier and more efficient. Further data collection is underway for more accurate and individualised care of metabolic patients.

Keywords: telemedicine, obesity, metabolic diseases, patient care, complex treatment