Complex functional evaluation of an esophagus

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The most common way of an esophagus functional evaluation is measuring the pressure changing in whole esophagus with manometry device. So-called high-resolution manometry (HRM) is an effective method of accurately definition of abnormalities in motor function [1]. The manometric protocol include a pressure recording during several 5-10-mL water swallows [2-4] during a short period of time. This procedure allows to detect some of the primary esophageal motility disorders such as achalasia, nutcracker esophagus, but total time of analysis is not enough for diagnose some esophageal motor abnormalities which occur unpredictably. The results of diagnosis can be improved with increasing of time of manometry procedure up to 24 hours [5, 6] and adding some extra helpful information, such as impedance, pH and heart rate monitoring [4] (Fig. 1). During 24-hours a system collects a huge amount of data and the problem is how to process that data in a short period of time. One of the possible solution is to develop analytical software which is calculated automatically some of the primary diagnostic parameters and helps medical specialists to find most problem zones (Fig. 1). With that goal the specialists of TUM and MIET launch the international research project. During the research long-time HRM files were generated by ViMeDat™ system (Standard Instruments GmbH, Karlsruhe, Germany) and developed the methods of automatic HRM data processing according Chicago classification [7]. Also there were developed some new parameters of functional evaluation of an esophagus such as total speed of esophagus contraction and 10 seconds contraction integral. Than the algorithm was analyzed on a real HRM data and a correlation between results of the algorithm work and type of esophageal dysfunction was detected. The received results will be used for further research and helps to improve functional evaluation of an esophagus. In research we are planning to: collect database of real 24 hours HRM and estimate a accuracy of our algorithm; combine HRM data with extra information and develop new algorithm according that data.

Fig. 1 The data included in circadian oesophagus evaluation system.

References