

CAPILLARY ELECTROPHORETIC ANALYSIS OF EXHALED BREATH CONDENSATE IN NON-INVASIVE DIAGNOSIS OF GASTROESOPHAGEAL REFLUX DISEASE

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Gastroesophageal reflux disease (GERD) is a disease caused by backflow of gastric contents into the esophagus due to the failure of physiological antireflux mechanisms and can lead to symptoms such as chronic cough, globus sensation, laryngitis, pharyngitis, rhinosinusitis, otitis media, bronchial asthma, COPD, sleep apnea and noncardiac chest pain. Currently there is no suitable, non-invasive diagnostic method applicable for GERD in clinical practice.

In this work, exhaled breath condensate (EBC) was tested as a non-invasive sample for GERD diagnosis. The EBC samples from three groups of individuals were analyzed. Two groups of patients with GERD (a group having a weakly acid reflux and a group having an acid reflux) and a group of healthy volunteers. pH values of EBC samples were measured. Capillary electrophoresis with contactless conductometric detection was used for analysis of ionic content of EBC. Additionally, pepsin was measured in saliva samples using commercially available lateral flow device.

We have identified statistically significant differences in pH and content of several ions (inorganic anions, organic acids) in EBC of the studied groups. The analysis of pepsin did not enable to differentiate among the groups of healthy and weakly acidic reflux. The identified ions and pH measurement could serve as potential biomarkers for distinguishing the patients with GERD and healthy individuals, without a need for invasive measurements, as is current clinical practice.

Acknowledgment

This research was carried out under the project CEITEC 2020 (LQ1601) with financial support from the Ministry of Education, Youth and Sports of the Czech Republic under the National Sustainability Programme II. The authors acknowledge the financial support from the Institutional support RVO: 68081715. This work was supported by Ministry of Health of the Czech Republic, grant nr. 17-31945A.