Detection of pepsin in sputum and exhaled breath condensate: could it be a useful marker for reflux-related respiratory disease?

Strugala, V1, Faruqi, S2, Dettmar, P.W1, Morice, A.H2.

1Technostics Limited, Hull, UK, 2Academic Medicine, Castle Hill Hospital, Cottingham, UK

Background: Extra-oesophageal reflux (EOR) is a common cause of unexplained chronic cough. A non-invasive diagnostic test in the form of a rapid lateral flow (LF) in vitro diagnostic device specific for human pepsin has been shown to be of benefit in the diagnosis of EOR1. This test is able to detect pepsin, as a marker of prior reflux, in a range of clinical specimens. We present data utilising sputum/saliva or exhaled breath condensate (EBC) of patients with chronic cough with and without recent symptoms.

Methods: Samples were obtained from patients who were clinically suspected to have reflux associated cough. Sputum/saliva was obtained by requesting the patient to cough up and spit into a tube containing 0.1 M citric acid. After centrifugation (to remove insoluble material) the supernatant was retained for analysis. The device for collecting EBC consisted of polypropylene tubing connected to a dreschel flask immersed in crushed ice. Unidirectional tidal breathing for approximately 10 minutes led to the collection of 1-2mls of EBC. 30 µl of the fluid collected was tested for the presence of pepsin using a novel LF in vitro diagnostic device with two unique monoclonal antibodies to human pepsin 3.

Results: Sputum/saliva was obtained from 12 patients (males 2, mean age 47 years) after recent symptoms (n=15) or when asymptomatic (n=7). 93% of symptomatic samples were positive for pepsin while only 1 (14%) of the asymptomatic samples was positive (p<0.001). EBC was obtained from 4 patients (males 2, mean age 50 years). Pepsin assay was positive in 2 patients who had recent symptoms and negative in the 2 who did not have recent symptoms.

Conclusion:

Pepsin LF in vitro diagnostic test performed on a variety of non-invasively obtained samples is able to confirm that symptoms are a consequence of reflux. This is the first demonstration that EBC, a common non-invasive sampling technique, can be used to collect refluxate into the upper airways and detect pepsin within recent experience of symptoms. This test could prove to be a highly valuable investigatory tool in the diagnosis of reflux associated cough.

References

1 Strugala et al. 2007 Gastroenterology 132(4Suppl1):A99-A100