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Title: Disturbed intestinal integrity in COPD patients; effects of activities of daily living

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Body: Background: Although COPD is accepted to be a systemic disease, the contribution of the gastrointestinal integrity has never been investigated. Aims: To investigate whether the intestine contributes to the systemic complexity of COPD. Method: 18 COPD patients (mean FEV1: 55±3%pred) and 14 age and sex matched controls were tested in rest and, at another day, during activities of daily living (ADLs). To assess small intestinal injury, plasma intestinal fatty acid binding protein (IFABP) levels were determined, whereas urinary excretion of orally ingested sugar probes was measured to assess gastrointestinal permeability. Data are depicted as mean±SEM. Results: Plasma IFABP levels were not different between patients and controls at rest (respectively 330±33 pg/ml and 280±37 pg/ml, P=0.28). In contrast, 0-3h urinary lactulose/rhamnose (COPD: 2.9±0.5, controls: 1.9±0.3 (x100), P=0.07) and sucralose/erythritol (COPD: 1.7±0.2 controls: 0.8±0.2 (x100), P<0.01) ratios and 5-24h urinary sucralose/erythritol (COPD: 3.8±1.3 controls: 2.2±1.3 (x100), P<0.05) ratios were significantly higher in patients compared to controls, indicating increased permeability of the small intestine and colon. Furthermore, the performance of ADLs led to increased plasma IFABP levels in COPD but not in controls (respective area under the curve, %: 1038±846 vs. -1465±401, P<0.05). In line, the difference in intestinal permeability was intensified. Conclusion: Besides altered gastrointestinal permeability in COPD patients at rest, performing ADLs led to enterocyte damage in addition to intestinal hyperpermeability in patients but not in controls, indicating functional alterations of the gastrointestinal tract in COPD.