

14th Annual Congress on

GASTROENTEROLOGY & HEPATOLOGY

August 06-07, 2018 Osaka, Japan



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Volatile organic metabolites as novel, non-invasive diagnostic biomarkers in inflammatory bowel disease

The diagnosis of Inflammatory Bowel Disease (IBD) requires extensive and often invasive investigations including colonoscopy, histology and places a heavy burden both on healthcare resources, because of the cost and on the individual, in times of disease-related disability and poor quality of life. Recently, there has been increasing interest in non-invasive biomarkers to diagnose IBD and to monitor the disease activity. There is growing scientific interest in the investigation of volatile metabolites and numbers of studies have focused on the utilization of non-invasive biomarkers in the diagnosis of GI disease. The developments of sophisticated analytical techniques have enabled the study and interpretation of changes in the fecal and breathe Volatile Organic Metabolites (VOMs) and its correlation with the pathophysiological mechanisms in IBD. VOMs are the chemicals that are the products and intermediates of metabolism and may be altered during the diseases process. Changes in the signature of VOMs could potentially provide diagnostic information about health and disease. Multiple studies have reported the differences in VOM profiles of healthy controls vs. patients with IBD other GI disorders. VOM profiles have been used to segregate patients by disease activity and the type of disease. The correlation of VOMs with microbiota is interesting and supports the hypothesis of gut microbial dysbiosis in the etiology of IBD. This provides an important platform to explore the role of dysbiosis in IBD and other GI disorders pathogenesis and development of novel therapeutic targets. In future, further understanding of fecal VOMs may lead to the development of a rapid and simple point of care diagnosis and monitoring of IBD.

Biography

Iftikhar Ahmed is a Consultant Gastroenterologist at University Hospital Southampton and Visiting Consultant at East Sussex Hospitals NHS Foundation Trust, UK. He is a Senior Clinical Lecturer at the University of Southampton UK. His research interests include investigating the changes in the smell of feces and breathe to understand the pathophysiological mechanisms of GI disorders and to develop a non-invasive biomarker. Through formal laboratory research, he studied the fecal volatile metabolomics profiles of patients with Liver disease (NAFLD), IBD and Irritable Bowel Syndrome (IBS) in comparison with healthy individuals and was awarded the degree of Doctorate of Medicine (MD) by University of the Bristol in 2012.

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