

Role of brain imaging in disorders of brain–gut interaction: a Rome Working Team Report

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Abstract

Imaging of the living human brain is a powerful tool to probe the interactions between brain, gut and microbiome in health and in disorders of brain–gut interactions, in particular IBS. While altered signals from the viscera contribute to clinical symptoms, the brain integrates these interoceptive signals with emotional, cognitive and memory related inputs in a non-linear fashion to produce symptoms. Tremendous progress has occurred in the development of new imaging techniques that look at structural, functional and metabolic properties of brain regions and networks. Standardisation in image acquisition and advances in computational approaches has made it possible to study large data sets of imaging studies, identify network properties and integrate them with non-imaging data. These approaches are beginning to generate brain signatures in IBS that share some features with those obtained in other often overlapping chronic pain disorders such as urological pelvic pain syndromes and vulvodynia, suggesting shared mechanisms. Despite this progress, the identification of preclinical vulnerability factors and outcome predictors has been slow. To overcome current obstacles, the creation of consortia and the generation of standardised multisite repositories for brain imaging and metadata from multisite studies are required.

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