Annals of General Psychiatry

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# Defining brain-gut syndromes pathophysiology

Irene Christodoulou*[1] and Ekaterini Chatzaki[2]

Address: [1]Surgical Department, Medical School, Democritus University of Thrace, Greece and [2]Department of Pharmacology, Medical School, Democritus University of Thrace, Greece

* Corresponding author

*from* International Society on Brain and Behaviour: 2nd International Congress on Brain and Behaviour
Thessaloniki, Greece. 17–20 November 2005

Published: 28 February 2006

*Annals of General Psychiatry* 2006, **5**(Suppl 1):S252 doi:10.1186/1744-859X-5-S1-S252

## Background

The characterization of corticotrophin-releasing factor (CRF) and CRF receptors and the development of specific CRF receptor antagonists selective for the CRF receptor subtypes have led to the understanding of the biochemical coding of stress-related alterations of gut motor function. Aim of this study is to include brain-gut syndromes in a common pattern of pathophysiologic mechanisms, related to the CRF family.

## Materials and methods

This non-systematic review presents the authors' selection of studies related to the CRF family of neuropeptides. Two databases were searched using basic search terms, and both authors also reported their own experience.

## Results

Irritable bowel syndrome, inflammatory bowel disease and anxiety disorders are conditions with common symptoms deriving from the gastrointestinal tract and it is well established that they are induced by psycological and stressful stimuli. It is known that brain CRF is involved in the cross-talk between the brain and the gastrointestinal system because systemic or central administration of CRF agents delays gastric emptying while stimulating colonic motor activity. Endogenous CRF in the brain plays a role in mediating various forms of stressor-induced gastric stasis, including postoperative gastric ileus, and activates colonic transit and faecal excretion elicited by psychologically aversive or fearful stimuli. Furthermore, recent studies indicate that peripheral CRF-related mechanisms also contribute to the mediation of stress-related alterations in gut motility. For example, non-peptide CRF1 antagonists and CRF injected intraperitoneally inhibited the stress-induced colonic hypermotility, similarly as antidepressants and anxiolytics, and these effects were mediated through peripheral receptors. It seems that CRF2 receptors are responsible for the inhibition of gastric emptying by CRF, a centrally mediated effect, whereas the anxiogenic colonic motor responses may involve peripheral CRF1 receptors. In conclusion, alterations of CRF-related mechanisms in the brain and periphery may contribute to the pathophysiology of stress-related gastroenterological syndromes.

## Discussion

Several psychological treatment interventions are used for brain-gut syndromes including active psychotherapeutic treatments. The CRF system characterization may be promising for significant advances in our understanding of these disorders and will contribute to the development of novel and more effective prophylactic and/or therapeutic approaches.

## References

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