Mucosal levels of substance P and somatostatin are increased in irritable bowel syndrome

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Introduction: Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder characterized by abdominal pain and altered bowel habits. The transient receptor potential vanilloid 1 (TRPV1) ion channel, which is involved in visceral pain signaling, has been shown to be upregulated in IBS. Activation of TRPV1 can lead to release of neuropeptides somatostatin and substance P (SP), among others, into the lamina propria. SP is involved in the mediation of visceral pain and plays a role in inflammatory responses. Somatostatin, on the other hand, has anti-inflammatory and anti-nociceptive properties. Alterations in the balance of mucosal levels of pro- and anti-nociceptive neuropeptide levels can therefore contribute to dysfunction in intestinal signaling and symptom generation in IBS.

Aim: To assess the concentration of the neuropeptides somatostatin and SP in colonic mucosal samples of patients with IBS in comparison to healthy volunteers and patients with ulcerative colitis (UC) in endoscopic remission as disease controls .

Methods: 14 patients with IBS (age 41±4 yrs SEM), 36 patients with UC in clinical and endoscopic remission (age 52±2 yrs) and 16 healthy volunteers (age 35±4 yrs) were included. Sigmoid colonic mucosal samples, 40 cm above the anal verge, were collected during sigmoidoscopy. Mucosal concentration of somatostatin and SP was determined using radio-immunoassay. Data expressed as mean±SEM. Data were compared by ANOVA and Tukey's post-hoc test.

Results:

	IBS patients	UC patients	Healthy controls	p value
Somatostatin (fmol/mg)	257±21	173±18	173±31	p<0.01 IBS vs UC p<0.05 IBS vs healthy
SP (fmol/mg)	95±6	83±7	88±11	p=0.02 IBS vs UC

The concentration of somatostatin was significantly higher in IBS patients compared to UC patients in remission or to healthy controls. Mucosal levels of SP in IBS patients were significantly higher in IBS patients compared to UC patients but not compared to healthy controls.

Conclusion: IBS patients exhibit higher colonic mucosal levels of the anti-inflammatory and anti-nociceptive neuropeptide somatostatin. This may reflect a compensatory mechanism to counter-act

chronic low-grade inflammation. On the other hand, levels of the pro-nociceptive SP were also elevated compared to disease controls. We therefore assume that luminal stimuli can lead to increased mucosal neuropeptide release through TRPV1 activation and can therefore contribute to symptom generation in IBS. Further studies will be necessary to elucidate the exact role of neuropeptides in IBS.