The Role of Anxiety and Depression in Irritable Bowel Syndrome

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Structure

• What is Irritable Bowel Syndrome?

• Aetiology of IBS
  – IBS models

• IBS, anxiety and depression

• Brief methodology of systematic review

• Preliminary findings

• Treatment implications
Irritable Bowel Syndrome

• Irritable bowel syndrome (IBS) is a chronic condition characterised by abdominal pain or discomfort and bowel disturbance in the absence of structural bowel abnormalities

• IBS affects 10 – 22% of the UK population

• IBS affects twice as many women than men

• IBS costs the NHS over 200 million pounds a year

IBS Symptoms

- **Abdominal pain and cramping** - often relieved by emptying the bowels
- **A change in bowel habits** - such as diarrhoea, constipation or both
- **Bloating and swelling** of abdomen
IBS Symptoms

• Flatulence

• **Urgent need** to go to the toilet

• A feeling they have **not fully emptied their bowels**

• Passing **mucus**

IBS symptoms affect quality of life, social functioning and time off work
ROME III Criteria

• Recurrent abdominal pain or discomfort at least 2 to 3 days a month in the last 3 months associated with two or more of the following:
  – Improvement with defecation
  – Onset associated with a change in frequency of stool
  – Onset associated with a change in form of stool

• Fulfilled for the last 3 months with symptom onset at least 6 months prior to diagnosis
ROME III Criteria

• The Rome III criteria distinguish IBS subtypes by predominant bowel habit disturbance
  
  – IBS with constipation (IBS-C)
  
  – IBS with diarrhoea (IBS-D)
  
  – Mixed or alternating bowel pattern with both diarrhoea and constipation (IBS-M or IBS-A)

ROME foundation: http://www.romecriteria.org/
Aetiology of IBS

• In the absence of a clear structural pathology, there has been a large debate around the aetiology of IBS

• Numerous studies have tried to investigate the specific causes of IBS. However, these are still unclear

• The pathophysiologic mechanisms believed to account for IBS symptoms include:
  
  – **Visceral hypersensitivity.** Lower visceral pain thresholds
  
  – **Autonomic nervous system dysregulation** (e.g. increased sympathetic activity)
Aetiology of IBS

– Smooth muscle hyper-reactivity. Increased motility

– Abnormalities in the levels of neurotransmitters

– CNS modulation. Brain-gut interactions

– Stress reactivity. Symptoms are worsened by stress

– Sustained activation of the immune system after infection, stress or other psychological factors

Dual-aetiology Hypothesis

- A heterogenous group of patients is labeled as IBS
- Some whose symptoms have a biological basis
- Others whose symptoms have a psychological basis
  - Comorbidity with other disorders
  - Excessive general somatic symptoms
  - Correlated with psychometric measures of depression, anxiety, stress

Psychosomatic Hypothesis

• Symptoms of IBS and other comorbid functional disorders have been attributed to the somatic expression of depression and anxiety disorders

• Based on this model, treating anxiety and depression is the key to reduce IBS symptoms

IBS and Psychological Comorbidity

• Psychological and psychiatric comorbidity is common among patients with IBS
  
  – The prevalence ranges from 40% to over 90% in tertiary care centres

• Numerous cross-sectional studies have found a positive relationship between anxiety and/or depression and IBS

IBS and Psychological Comorbidity

• The methodology of cross-sectional studies is not robust enough to find causal links between anxiety, depression and IBS onset

• Longitudinal studies that analyse the predictive role of anxiety and depression can elucidate better the psychological mechanisms underlying IBS aetiopathology
Systematic Review

Primary Objective

• Understand the nature of the relationship between anxiety/depression, and the onset of IBS
  – Do anxiety/depression predict IBS onset?

Secondary Objective

• Understand the nature of the relationship between anxiety/depression and IBS ongoing symptoms
Why is this review relevant?

• Understanding the pathway(s) through which anxiety and depression affect IBS onset and ongoing symptoms may have an impact on:

  – The development of interventions focused on IBS prevention

  – The development of interventions focused on IBS management
Criteria for selecting studies

Study design

• Prospective longitudinal observational (or case-control) studies that focus on the development of IBS in healthy individuals or individuals with a GI infection (objective 1)
Study design

Measurements of A/D in participants who do not have IBS → Measurements to establish an IBS diagnosis at the end point

Do A/D at baseline predict IBS onset at follow-ups?
## Summary of Data Extraction

<table>
<thead>
<tr>
<th>Authors</th>
<th>Community/Hospital</th>
<th>GI Infection</th>
<th>Follow-ups</th>
<th>N baseline</th>
<th>N at follow-ups</th>
<th>A/D measurements</th>
<th>Univariate</th>
<th>Multivariate</th>
<th>Covariates</th>
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</thead>
<tbody>
<tr>
<td>1. Gwee et al., 1999</td>
<td>Hospital</td>
<td>Yes</td>
<td>3 mths</td>
<td>109</td>
<td>94 (86.2%)</td>
<td>HADS</td>
<td>Anxiety, somatisation, hyponochondriasis, life events, neuroticism</td>
<td>Life events, hypochondriasis</td>
<td>Age, sex, marital, employment and stool culture status</td>
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<td>2. Gwee et al., 1996</td>
<td>Hospital</td>
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<td>3 mths</td>
<td>86</td>
<td>75 (87.2%)</td>
<td>HADS</td>
<td>Anxiety, depression, somatisation</td>
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<td>3. Talley et al., 2001</td>
<td>Community</td>
<td>No</td>
<td>3 and 8 yrs (21 and 26 yrs old)</td>
<td>993</td>
<td>992 (99.9%) and 890 (89.6%)</td>
<td>Diagn. Interview Schedule</td>
<td>Not statistic. Interview Schedule</td>
<td>Not statistic. Interview Schedule</td>
<td>Not statistic. Interview Schedule</td>
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</table>

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**Authors:** Community/Hospital

**GI Infection:** Yes

**Follow-ups:** 3 mths

**N baseline:** 109

**N at follow-ups:** 94 (86.2%)

**A/D measurements:** Anxiety, depression, somatisation, hypochondriasis, life events, neuroticism

**Univariate:** Anxiety, depression, somatisation

**Multivariate:** Anxiety

**Covariates:** Age, sex, marital, employment and stool culture status

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**Authors:** Community

**Follow-ups:** 3 mths

**N baseline:** 86

**N at follow-ups:** 75 (87.2%)

**A/D measurements:** Anxiety, depression, somatisation, hypochondriasis, life events, neuroticism

**Univariate:** Anxiety

**Multivariate:** Anxiety

**Covariates:** Duration of illness

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**Authors:** Community

**Follow-ups:** 3 and 8 yrs (21 and 26 yrs old)

**N baseline:** 993

**N at follow-ups:** 992 (99.9%) and 890 (89.6%)

**A/D measurements:** Diagnosis, Interview Schedule

**Univariate:** Not statistic. Interview Schedule

**Multivariate:** Not statistic. Interview Schedule

**Covariates:** Not statistic. Interview Schedule
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<th>Multivariate</th>
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<tr>
<td>4. Parry et al., 2005</td>
<td>Community</td>
<td>Yes</td>
<td>6 mths</td>
<td>122</td>
<td>107 (87.7%)</td>
<td>HADS. Categorical</td>
<td>Age, smoking, depression, life events</td>
<td>Depression</td>
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<td>5. Borgaonkar et al., 2006</td>
<td>Community</td>
<td>Yes</td>
<td>3 mths</td>
<td>191</td>
<td>99 (51.8%)</td>
<td>HADS</td>
<td>Fever, shorter duration of diarrhoea</td>
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<td>6. Moss-Morris &amp; Spence, 2006</td>
<td>Community, 1 care</td>
<td>Yes</td>
<td>3 and 6 mths</td>
<td>835</td>
<td>775 (92.8%) and 748 (89.6%)</td>
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<td>Campylobacter infection, anxiety</td>
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<th>Multivariate</th>
<th>Covariates</th>
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</thead>
<tbody>
<tr>
<td>7. Spence &amp; Moss-Morris, 2007</td>
<td>Community, 1 care</td>
<td>Yes</td>
<td>3 and 6 mths</td>
<td>620</td>
<td>581 (93.7%) and 547 (88.2%)</td>
<td>HADS. Categorial</td>
<td>Anxiety, somatisation, perceived stress, negative illness beliefs, all or nothing behaviour, limiting behaviour, gender</td>
<td>Anxious achievement (perfectionism, perceived stress and anxiety), all or nothing behaviour</td>
<td>Age, gender, and the other predictors</td>
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<td>GI Infection</td>
<td>Follow-ups</td>
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<td>A/D measurements</td>
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<td>8. Nicholl et al, 2008</td>
<td>Community</td>
<td>No</td>
<td>15 months</td>
<td>3732</td>
<td>2456 (65.8%)</td>
<td>HADS Categorical</td>
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<td>Illness behaviours. Anxiety approached significance</td>
<td>Age, gender, abdominal pain at baseline</td>
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<td>9. Koloski et al., 2011</td>
<td>Community</td>
<td>No</td>
<td>12 yrs</td>
<td>1775</td>
<td>1002 (56.5%)</td>
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<td>Anxiety disorders, Depressive disorders</td>
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<td></td>
<td>Anxiety</td>
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<tr>
<td>Yes (multivariate)</td>
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<td>Yes (univariate)</td>
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<td>No predictor</td>
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<td>5</td>
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Preliminary Findings

• Anxiety is a stronger predictor of IBS onset than depression in patients with a GI infection at baseline
  
  – Only one study with this population found that depression predicts IBS onset (multivariate analysis)
  
  – HADS score of 11 or above (rather than 7 or 8) taken as the presence of anxiety or depression
  
  – Small number of subjects with depression
Preliminary Findings

• In prospective studies with healthy community samples, the role of anxiety and depression in the development of IBS does not seem to differ significantly

  – Only one study found that anxiety and depression are not predictors of IBS (they used a diagnostic structured interview)

  – The other two studies found that both anxiety and depression are predictors of IBS onset (univariate analysis)
Preliminary Findings

- Two studies found that unhelpful illness behaviours and cognitions are predictors of IBS onset
  - One study found that illness behaviours is the best predictor of IBS onset (multivariate analysis)
  - One study found that all-or-nothing behaviour and anxious achievement predict IBS onset (multivariate analysis)
  - The same study found that unhelpful illness/symptom cognitions predict IBS onset (univariate analysis)
Two studies found that a biological component at baseline is the best predictor of IBS onset in individuals with a GI infection.

- One study found that fever was the only predictor of IBS onset (multivariate analysis).
- One study found that Campylobacter infection and anxiety are predictors of IBS onset (multivariate analysis).
Preliminary Findings

- The results of these studies support a biopsychological model of IBS, rather than a model assuming IBS is a somatic expression of anxiety/depression

  - The interaction of biological, emotional, cognitive and behavioural factors seems to lead to IBS onset
Cognitive Behavioural Model

Early Cycle of IBS Onset
Infection, such as gastroenteritis, and/or stress

Predisposing factors

People with anxious or depressive tendencies and high levels of perfectionism

Perpetuating behaviours

Stress and overactivity exacerbate symptoms again and they return to bed

Their initial reaction may be to press on and remain active

They very quickly try to return to premorbid levels of activity

Resting conflicts with the perfectionist’s desire to achieve and heightens feelings of anxiety

This worsens symptoms, forcing them to rest for a period

Possible precipitating factors
Cognitive Behavioural Model

- **Biological components**: infection (gastroenteritis) or change in bowel function (due to different factors, such as stress)

- **Emotional components**: anxious or depressive tendencies
Cognitive Behavioural Model

• **Cognitive components**: high personal expectations (perfectionism), negative illness beliefs

• **Behavioural components**: this pattern of pushing too hard or being overactive and then needing to rest for prolonged periods is known as all-or-nothing behavior

Limitations of studies

• ROME criteria are largely used in research

  – Are anxiety/depression predictors of IBS in patients that fulfill these criteria in particular?

• Studies with several long-term follow-ups are needed to evaluate the variability of IBS diagnosis over time

• Studies analysing sub-groups of IBS are also needed
Limitations of studies

• Only one study assessed anxiety/depression with a clinical structured interview

• The prevalence of IBS onset in community samples with healthy individuals is small (the percentages range from 2.3% to 3.8%, ROME criteria)

  – Do these studies have enough power to conduct the statistical analyses?
Treatment Implications

- Anxiety and depression seem to play an important role in IBS onset
  - However, anxiety is a stronger predictor of IBS onset
  - IBS is a heterogeneous condition and different factors interact in different combinations

It seems relevant to tailor treatment depending on the patient’s profile
Treatment Implications

- Preventive treatments should not only focus on reducing anxiety or depression levels but also:
  - Reducing counter-productive behaviours (e.g. limiting or all-or-nothing behaviour)
  - Reducing negative illness cognitions
  - Seeking treatment for GI infections, in order to reduce the duration of acute symptoms such as fever and diarrhoea
Thank You