Inflammatory vs. non-inflammatory predictors of specific depressive symptoms in a large pediatric cohort with IBD

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Introduction

Youth with IBD are at increased risk of depression\(^1,^2\)

Depression is a heterogeneous condition with different symptom profiles\(^3\)

Nearly 20% of depressed youth with IBD have somatic-symptom predominant depression\(^4\)
Introduction

Somatic symptoms may overlap with serum sickness and may resemble IBD activity.
Aims

• To elucidate the role of inflammation in somatic-type depression in youth with active IBD

• Focused on youth with Crohn’s disease
  – 75% of sample
  – More associated with systemic inflammation
Methods

• 765 subjects 9-17 with IBD → 541 with CD
• Screened for depression via Children’s Depressive Index (CDI)\(^5\)
• Disease activity assessed via Pediatric Crohn’s Disease Activity Index (PCDAI)\(^6\)
  - Subjective (abdominal pain, stool frequency, well-being)
  - Objective laboratory results
  - Objective physical exam findings
Exploratory factor analysis (EFA) was used to identify depressive symptom clusters and created factor subscales of different groups of depressive symptoms.

Multiple regression modeling was used to identify predictors of each depressive symptom cluster.
## Results

<table>
<thead>
<tr>
<th>Variable (N = 541)</th>
<th>N (%) or Mean (SD)</th>
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<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>14.1 (2.5)</td>
</tr>
<tr>
<td>Male</td>
<td>284 (51.8%)</td>
</tr>
<tr>
<td>Caucasian</td>
<td>497 (91.4%)</td>
</tr>
<tr>
<td><strong>IBD activity</strong></td>
<td></td>
</tr>
<tr>
<td>Inactive (PCDAI &lt;10)</td>
<td>224 (46.8%)</td>
</tr>
<tr>
<td>Mild (10-27.5)</td>
<td>180 (37.6%)</td>
</tr>
<tr>
<td>Moderate (30-37.5)</td>
<td>35 (7.3%)</td>
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<tr>
<td>Severe (40-100)</td>
<td>40 (8.4%)</td>
</tr>
<tr>
<td>Depression (CDI &gt; 12)</td>
<td>211 (38.8%)</td>
</tr>
<tr>
<td>Hx surgery</td>
<td>20 (9.4%)</td>
</tr>
<tr>
<td>Hx ostomy</td>
<td>26 (12.3%)</td>
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<tr>
<td>Current steroid tx</td>
<td>59 (28.1%)</td>
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</tbody>
</table>
Factor Analysis of 27 Items of CDI

**Somatic-Affective**
- Somatic worry
- Sleep disturbance
- Reduced appetite
- Anxiety/Pessimism
- Fatigue
- Irritability
- Crying/Sadness

**Low Self-Esteem**
- Disobedience
- Unmotivated
- Fighting
- School failure
- Negative self-view

**Suicidality**
- Suicidal ideation
- Unloved
- Self-hate
- Loneliness

**Anhedonia**
- Friendless
- Social withdrawal
- Anhedonia, school
- Anhedonia
Somatic-Affective

Somatic worry, fatigue, sleep disturbance, irritability, reduced appetite, crying, sadness, anxiety, pessimism

- Associated factors (p < 0.01):
  - Female gender
  - Corticosteroid use
  - Elevated PCDAI subscales
  - Elevated ESR
  - Low hematocrit or albumin

- Multiple regression modeling explained 27.9% of the variance (p < 0.01)

- Subjective PCDAI symptoms made unique significant contributions to the model
Anhedonia

Loss of interest, social withdrawal, friendlessness

• Associated factors ($p < 0.01$):
  – Elevated PCDAI subjective
  – Elevated PCDAI objective lab score
  – Elevated inflammatory markers (ESR or CRP)
  – Corticosteroid use

• Multiple regression modeling explained 8.4% of the variance ($p < 0.01$)

• Subjective PCDAI symptoms made unique significant contributions
Cognitive Clusters

Low self-esteem, disobedience, amotivation
Suicidality, self-hate, loneliness

• Predictors for low self-esteem and suicidality clusters: PCDAI subjective symptoms
  – Not inflammation!
  – Explained 2.0% of variance in low self-esteem symptoms and 4.8% of variance of suicidality (p < 0.01)
Conclusions

While inflammatory markers and overall disease activity contribute significantly to somatic-affective symptoms and anhedonia in youth with IBD, this is not the whole story.

Cognitive symptoms don’t seem to be explained at all by inflammation - may be driven more by functional symptoms than inflammation.
Conclusions

Identification of symptom clusters can guide treatment of comorbid IBD and depression.

Even if somatic-affective symptoms stem from inflammation, referral to psychotherapy can improve symptoms more rapidly.
References


