Prevalence of lactose intolerance amongst patients with irritable bowel syndrome
• Irritable bowel syndrome is GI disorder characterized by abdominal pain, bloating and altered bowel habits.

• There are three types of IBS:
  - D-IBS.
  - C-IBS.
  - M-IBS.
Prevalence

• IBS affects around 11% of the population globally.

• IBS In Palestine: The prevalence of IBS among middle-aged and elderly residents is high.
Risk factors

1) Postinfection in GI.

2) Female gender, younger age.

3) Psychological stress, and current smoking.
Diet’s Role

IBS symptoms are triggered by the consumption of the poorly absorbed (FODMAPs) and insoluble fibre.
Diet’s Role..cont

- Salicylate
- Milk
- Wheat
Study Design

Exclusion Criteria:
1) Other GI disorders.
2) Has IBS symptoms for less than 6 months.
3) Age < 18.
4) Undiagnosed by a specialist.
Method

- FFQ was used to obtain the information.
- The sample size included 50 patients with IBS.
- Independent T-test.
## Results and Discussion

<table>
<thead>
<tr>
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<th>Lactose intolerance</th>
<th>Lactose tolerance</th>
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<tbody>
<tr>
<td>IBS</td>
<td>57%</td>
<td>43%</td>
</tr>
<tr>
<td>IBS-D</td>
<td>40%</td>
<td>42%</td>
</tr>
<tr>
<td>IBS-C</td>
<td>20%</td>
<td>32%</td>
</tr>
<tr>
<td>IBS-M</td>
<td>16%</td>
<td>5%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>Most of them &gt;40</th>
<th>Most of them &lt;40</th>
<th>P-value &lt;0.05</th>
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</thead>
<tbody>
<tr>
<td>Post-inflammarory IBS</td>
<td>56%</td>
<td>42%</td>
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Results..Symptoms

- Upper bloating: 75%
- Lower bloating: 25%
- Abdominal pain: 73%
- Heart pain: 61%
- Stress: 64%
- Smell mouth: 16%
Results

- Wheat: 7%
- Fried food: 66%
- Legumes: 70%
Female Vs. Male

- Female: 82%
- Male: 18%
Lactose Intolerance Vs. IBS

• Lactose malabsorption occurs in three main types:

- Primary adult hypolactasia.

- **Secondary hypolactasia** GI illness that damages the brush border or transit time in the jejunum mucosa.

- Congenital alactasia: Lifelong complete absence of lactase is rare.
Altered microbiota

Lactose can be a food source for harmful bacteria such as:

- **Gas-producing organisms**: result in flatulence.
- **Firmicutes**: causes abdominal pain.
- **Methanogenic bacteria**: IBS-C & intestinal transit.
Inflammation’s role

Post-infectious IBS:

- ↑ EC cells in the rectal mucosa.

- ↑ Postprandial serotonin levels.
Antibiotic’s role

Broad spectrum antibiotics:-

- Bacteria **killers**.

- **Disturb** the balance of good to bad bacteria in the intestines causing diarrhea and other problems.

- **C. difficile** infections -> toxins
  1- Destroy cells.
  2- Produce patches of inflammatory cells.
  3- Decaying cellular debris inside the colon cause watery diarrhea.
Pathophysiology

• Brain-Gut Axis that constitutes ENS and Gut wall becomes dysfunctional.

• Alterations in *secretions of hormones* that play a key role in the digestion:
  
  - Motilin.
  - Gastrin.
  - Cholecystokinin (CCK).
  - Peptide YY.
Pathophysiology

One of the mechanisms trigger IBS symptoms is luminal distension that results from:

- short chain carbohydrate (SCC) are *osmotically active* thus increase luminal water.

- SCCs are substrates for *colonic bacterial fermentation*.
Role of mast cells

- Visceral Hypersensitivity and Intestinal Dysmotility
- Serotonin Signaling
- Intestinal Secretion and Permeability
• Alterations in intestinal secretion & permeability.

- can be induced by MC mediators.

- Activated MC → intestinal permeability.
• **Visceral hypersensitivity**: is the term used to describe the experience of pain within the inner organ.

• foods and stress can activate mast cells

• mediators such as histamine and protease have been reported to induce hypersensitivity in the nerve terminals.
Mast cells & activity in the lower GI which are activated by **serotonin**.

- Release mediators (histamine and protease) altering **peristalsis** thus cause diarrhea or constipation

- Impact **intestinal transit** and **fluid content**.
- $\uparrow$ E. coli & $\downarrow$ Bifidobacterium $\rightarrow$ leads to altered bile acid metabolism.

- $\downarrow$ Butyrate-producing bacteria : is a protective factor against visceral sensitivity.
Anxiety and Depression

- Activity of the autonomic nervous system.

- Stimulate motility alterations through mast cell mediator release.
Heartburn & IBS

↑ Serotonin → Heartburn.

- Relaxation of esophageal sphincter.

- Gastrointestinal motility.

- Visceral hypersensitivity.
Gender & IBS..

Changes in female hormone levels (menstrual cycle):

- Hormones affect the transit time of food through the digestive tract.
Conclusion

Most of patients with irritable bowel syndrome are lactose intolerant. Most of whom are IBS-D that positively associated with age. Additionally, most of patients with postinflammatory IBS are lactose intolerant.