Clinical Pharmacy I

Gastrointestinal Conditions

1-Diarrhea

1-Diarrhea is an ***increased frequency*** of bowel evacuation with the passage of abnormally ***soft or watery stools*** .

2-Although the normal frequency of bowel movements **varies with each individual**, more than **three bowel movements** per day are considered **abnormal**

3-Diarrhea may be **acute** (less than 14 days duration), **persistent** (14 days to 4 weeks duration), or **chronic** in nature (more than 4 weeks).

Chronic and persistent diarrheal illnesses are often **secondary to other chronic medical conditions (or treatments**) and need medical care.

Causes

1-Acute diarrhea (infective diarrhea, gastroenteritis):

The most common causes of acute diarrhea are bacterial and viral infection and food toxins.

Rotavirus responsible for causing severe diarrhea **in infants and children** and the most common cause of gastroenteritis among children worldwide .

The peak infectious period is during **winter**. Spread is by **fecal-oral** route .

Associated symptoms are those of a cold and perhaps a cough . Whilst in the **majority the infection is usually not too severe and is self-limiting**, it should be remembered that rotavirus infection can cause death. This is most likely in those infants already malnourished and living in poor social circumstances who have not been breastfed .

Note: **vaccine** is available to protect against rotavirus .

Bacterial: These are ***the food-borne infections*** (previously known as food poisoning). There are several different types of bacteria that can cause such infections: ***Salmonella***, ***Shigella***, pathogenic ***Escherichia coli***,…….. . The typical symptoms include severe diarrhea and/or vomiting, with or without abdominal pain .

Antibiotics are generally unnecessary as most food-borne infections resolve spontaneously

The most important treatment is adequate fluid replacement.

Antibiotics are used (by prescription only) for ***Shigella*** infections and the more severe ***Salmonella***. *Ciprofloxacin* (**by prescription**) may be used in such circumstances.

Protozoan: Examples include ***Entamoeba histolytica*** (amoebic dysentery) and ***Giardia lamblia*** (giardiasis). Diagnosis is made by sending stool samples to the laboratory.

2-Chronic diarrhea

There are several causes and chronic diarrhea requires medical investigation.

Causes include: **Irritable-bowel syndrome** (IBS), inflammatory bowel disease (**Crohn's disease, ulcerative colitis), malabsorption syndromes (such as celiac disease),……**

Patient assessment with diarrhea

1-Age

Infants (<1 years) and elderly patients are especially at risk of becoming dehydrated. In newborn, water comprise up to 75% of total body weight. After 8-10 bowel movements within 24 hours period, a 2-month-old infant could lose enough fluid to cause circulatory collapse and renal failure.

2-Duration

Diarrhea of >1 day duration in children <1 year----------Referral.

(but in babies under 3 months: refer immediately)

Diarrhea of >2 days duration in children <3 years and elderly patients----------Referral.

Diarrhea of >3 days duration in older children and adults---------Referral.

Diarrhea of more than 24 hours in people with diabetes---------Referral.

3-Severity

Severe diarrhea (passing 6 or more unformed stool in 24 hours) required referral

4-Periodicity

A history of recurrent diarrhea of no known cause ---------should be referred for further investigations

5-Associated symptoms

The presence of blood or mucus in the stools---------- is an indication for referral for further investigations

Diarrhea with severe vomiting or with high fever -------referral for further investigations

Diarrhea with severe abdominal pain -------referral for further investigations

6-Recent travel abroad

Diarrhea in patient who has recently traveled abroad requires referral since it may be infective in origin (Traveler's diarrhea)

7-Sign of dehydration :Patient with signs or symptoms of debilitating dehydration required referral (table-1).

Table-1: Symptoms of dehydrations in children and adults	
children	**adults**
Dry mouth, tongue and skin Fewer or no tears when crying Decreased urination (less than 4 wet diapers in 24 hours) Sunken eye, cheeks or abdomen sunken fontanel decreased skin turgor irritability or listlessness	Increased thirst Decreased urination Feeling weak or lightheaded Dry mouth/ tongue

8-Medication :Medicines already tried: The pharmacist should establish the identity of any medication that has already been taken to treat the symptoms in order to assess its appropriateness.

Other medicines being taken:

Details of any other medication being taken (both OTC and prescribed) are also needed, as the diarrhea may be drug induced (Table -2).

Table-2: Some drugs that may cause diarrhea.
Antacids: *Magnesium salts*
Antibiotics
Antihypertensives: *methyldopa*; beta-blockers (rare)
Digoxin (toxic levels)
Diuretics (*furosemide*)
Iron preparations
Laxatives
Misoprostol
Non-steroidal anti-inflammatory drugs
Selective serotonin reuptake inhibitors

Treatment timescale

One day in children, otherwise 2days

Management

A-Advices for patients suffering from diarrhea

1-Drink plenty of clear fluids, such as water.

2-Avoid drinks high in sugar as these can prolong diarrhea.

3-Avoid milk and milky drinks, as a temporary lactose intolerance occurs due to damage done by infecting organisms to the cells lining the intestine, making diarrhoea worse.

4-Babies should continue to be fed as normal, whether by breast or bottle.

B-Oral rehydration therapy

1-The risk of dehydration from diarrhea is greatest in babies, and rehydration therapy is considered to be the standard treatment for acute diarrhea in babies and young children

2-Oral rehydration sachets may be used with antidiarrheals in older children and adults

3-Rehydration may still be initiated even if referral to the doctor is advised

A premixed solutions or Sachets of powder for reconstitution are available; these contain sodium as chloride and bicarbonate, glucose and potassium. The absorption of sodium is facilitated in the presence of glucose

4-Table-3 provides the volumes required per watery stool

Table 3 Amount of rehydration solution to be offered to patients.

Age	Quantity of solution (per watery stool)
Under 1 year	50 mL (quarter of a glass)
1–5 years	100 mL (half a glass)
6–12 years	200 mL (one glass)
Adult	400 mL (two glasses)

5-Reconstitution of ORS: Only water should be used to make the solution and that boiled and cooled water should be used for children < 1 year

6-Stability of ORS after reconstitution: After reconstitution, any unused solution should be discarded after 1 hour of preparation unless it stored in refrigerator where it may kept for up to 24 hours

7-If the child is vomiting, give 1 teaspoon of ORS every few minutes

C-Antimotility Drugs:

1-Co-phenotrope (Diphenoxylate+Atropine) [Atropine is included at a sub-therapeutic dose to discourage abuse (unpleasant anti-muscarinic effects will be experienced if higher than recommended doses are taken). Co-phenotrope is considered an OTC drug only for patient of > 16 years old. Adult doses: 4 tablets initially followed by 2 tablets every 6 hours

2-Loperamide is considered an OTC drug only for patient of > 12 years old. Adult dose: Initially 2 tablets (4 mg) followed by 1 tablet (2 mg) after each loose stool (max. 8 tablets / day)

D-Adsorbents: Like Pectokaolin® (pectin +kaolin)

Adsorbents such as kaolin are not recommended for acute diarrheas .There is little or no evidence that adsorbents are effective in diarrhea.

Notes:

A-Probiotics (dietary supplement): Probiotics are dietary supplements containing bacteria (including several Lactobacillus species) that may promote health by enhancing the normal microflora of the GI tract while resisting colonization by potential pathogens. Probiotics have been shown to decrease the duration of infectious and antibiotic-induced diarrhea in adults and children

B-Use of zinc in children with diarrhea: Several large studies performed in developing countries have shown that daily zinc supplementation in young children with acute diarrhea reduces both the duration and severity of diarrhea

The WHO/UNICEF recommends that children with acute diarrhea also receive zinc (10 mg) of elemental zinc/day for infants younger than 6 months; 20 mg of elemental zinc/day for older infants and children) for 10 to 14 days.

2-Irritable Bowel Syndrome (IBS)

1-IBS is defined as: a functional bowel disorder in which abdominal pain is associated with abdominal distention and a change in bowel habit (diarrhea and constipation may occur; sometimes they alternate)

2-The two main classifications of IBS are IBS with constipation predominant (IBS-C) and IBS with diarrhea predominant (IBS-D). Some patients may also have IBS with alternating diarrhea and constipation (IBS-A).

3-IBS occurs in 10-20% of people worldwide. The cause is unknown. Some possible causes include **genetic mutations**, **abnormal GI motility**, **enhanced gut pain sensation (visceral hypersensitivity)**, or **psychological changes**. Most likely a combination of these factors leads to IBS.

Patient assessment with IBS

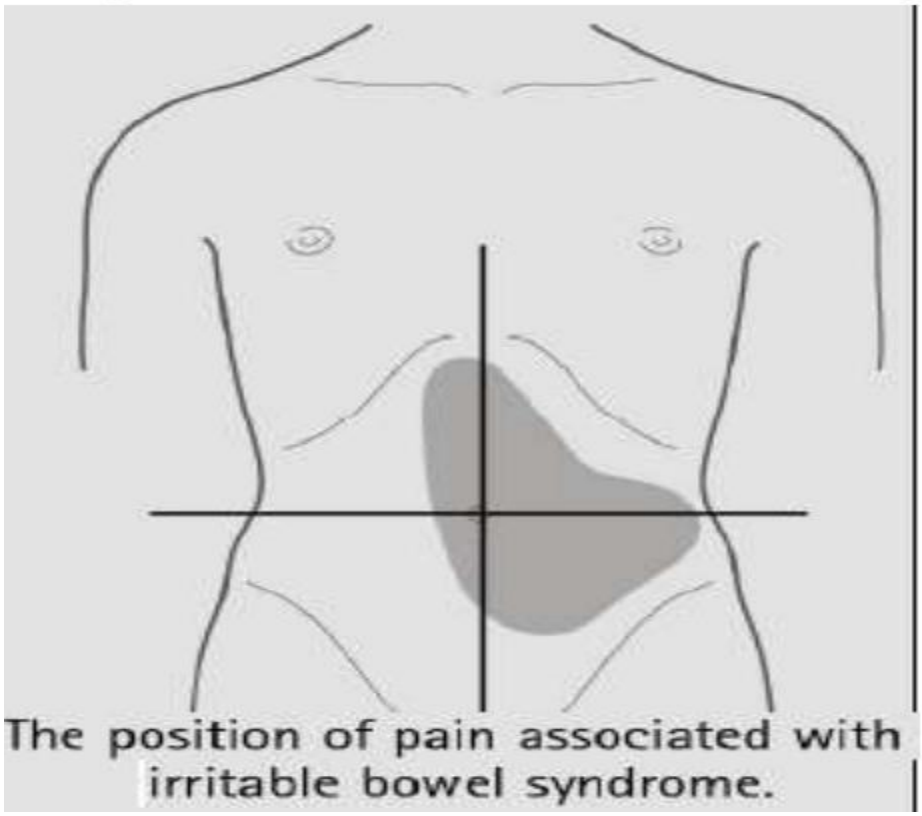
1-Age: Because of the difficulties in the diagnosis of abdominal pain in children …….it is best to refer children less than 16 years. IBS often develop in young adult life . If an older (above 45) person presenting with for the first time with no previous history of bowel problems--------referral should be made .

2-Symptoms:

IBS has three Key symptoms: abdominal pain, abdominal distention/bloating and disturbance of bowel habit

A-Abdominal pain: The pain can occur anywhere in the abdomen. It is often central or in left sided and can be severe (pain normally located in the left lower quadrant)

The site of pain can vary from person to person and even for an individual . Sometimes the pain comes on after eating and can be relieved by defecation or the passage of wind



The position of pain associated with irritable bowel syndrome.

B-Bloating: A sensation of bloating is commonly reported. Sometimes it is so severe that clothes have to be loosened

C-Bowel habit: Diarrhea and constipation may occur; sometimes they alternate. A **morning rush** is common, where the patient feels an urgent desire to defecate several times after getting up in the morning and following breakfast, after which the bowel may settle .There, may be a feeling of incomplete emptying after a bowel movement. The motion is often described as loose and semiformed rather than watery. Sometimes it is like pellets or rabbit dropping, or pencil shaped.

There may be a mucus but never blood

D-Other symptoms: Some patients may also complain of nausea, and other unrelated symptoms such as: backache, feeling tiered, urinary urgency, and the need to pass urine during the night.

Patient with unexplained weight loss, or with signs of bowel obstruction (like vomiting) ------referral for further investigation

3-Periodicity: IBS tend to be episodic. The patient might have a history of being well for a number of weeks or months in between bouts of symptoms

4-Previous history:

To know whether the patient has consulted the Dr. about the symptoms and if so, what they were told. Any history of previous bowel surgery would suggest a need for referral

5-Aggravating factors: Stress appears to play an important role and can precipitate and exacerbate symptoms. Also some types of food may aggravate IBS

6-Pregnant women: ---------- referral for further investigation

7-Medication: To know:

1-What had been tried to treat the condition and whether it produced an improvement (Unresponsive to appropriate treatment required referral)

2-Other medicines (IBS is associated with depression and anxiety in many patients).

Treatment timescale

Symptoms should start to improve within a week

Management

A-Diet:

Patient with IBS should follow the recommendation for a healthy diet (low fat, low sugar, high fiber) In addition patient should avoid any food they know to exacerbate their symptoms

Various foods such as beans, and fatty meals, and gasproducing foods such as legumes, may aggravate symptoms in some patients although

the effectiveness of such practices remains controversial

B-Antispasmodics:

Antispasmodics are the main stay of OTC treatment of IBS. They work by a direct effect on the smooth muscle of the gut, causing relaxation and thus reducing abdominal pain. The patient should see an improvement within a few days of starting

1-Mebeverine: On the basis of evidence, it should be the 1st line choice . It is given in a dose of 135 mg (1 tablet) three times a day, preferably 20 minutes before meals.

2-Alverine citrate: Alverine citrate is given in a dose of 60–120 mg (one or two capsules) up to three times a day

3-Pippermint oil capsules: Capsules containing 0.2 mL of the oil are taken in a dose of one or two capsules three times a day, 15–30 min before meals

4-Hyoscine butylbromide: The recommended dose for adult is one tablet(10 mg) three times a day , although this can be increased to two tablets four a day if necessary.

Practical prescribing: Summary of IBS medicines			
Name of medicine	**Likely side effects**	**Drug interactions of note**	**Patients in which care exercised**
Hyoscine	Constipation and dry mouth	Tricyclic antidepressants, neuroleptics, antihistamines and disopyramide	Glaucoma, myasthenia gravis and prostate enlargement
Mebeverine	None	None	None
Peppermint Oil	Heartburn	None	None
Alverine	Rash	None	None

C-Laxatives and antidiarrheals:

1-In addition, Bulk-forming and stimulant laxatives can be used to treat constipation predominant (IBS-C) . Insoluble fiber (e.g. bran) may exacerbate symptoms and its use should be discouraged

2-Use of OTC antidiarrheals such as loperamide is appropriate only on an occasional, short-term basis

D-Compound preparations:

Bulking agents are also available in combination with antispasmodics

e.g. Fybogel® Mebeverine: effervescent Granules (in sachets), contain ispaghula husk (Bulk-forming laxatives) and mebeverine hydrochloride

Dose: 1 sachet in water, morning and evening 30 minutes before food; an additional sachet may also be taken before the midday meal if necessary

E-Probiotics:

Probiotics such as lactobacillus and Bifidobacterium have also been promoted for IBS. The studies showed that probiotics appear to be effective however the size of the effect need to be established.

Notes:

Prescription therapy for IBS:

1-A tricyclic antidepressant can be used for abdominal pain or discomfort [unlicensed indication] in patients who have not responded to laxatives, loperamide, or antispasmodics .

2-A selective serotonin reuptake inhibitor may be considered in those who do not respond to a tricyclic antidepressant [unlicensed indication].