several times a day.

- ...ounts of milk in moderate lactose activity can be tolerated if taken with other foods e.g. after a meal or a snack.
- Curds is better tolerated than milk.
- Low lactose foods if available commercially like ice cream, cottage cheese, try them.
- Lactose enzymes are available these can be added in the milk.
- Deficiency of lactose and calcium could be supplemented by giving other foods.

The last malabsorption syndrome which will be discussed is the inflammatory bowel disease which is a broad term that refers to a number of disorders of the bowel.

14.2.9.4 Inflammatory Bowel Disease (IBD)

Inflammatory bowel disease is a general term used to refer to chronic inflammatory condition of the intestine. It is applied to three conditions having similar symptoms but different underlying clinical problem. It includes:

1. Ulcerative colitis
2. Crohn's disease
3. Short bowel syndrome

inflammatory process: Crohn's disease can occur in any part of the GI tract — the small intestines the colon and even the colorectal region. However, in ulcerative colitis, the inflammation is confined to left colon and rectum.

2) In Crohn's disease, inflammatory process affects the entire thickness of the wall of the small intestine leading to strictures that can cause obstructions or formation of fistulas. In ulcerative colitis the inflammatory process is in mucosa and sub mucosal tissues of the intestine and lasts for a few weeks.

Having looked at the difference between ulcerative colitis and Crohn's disease, let us next review the etiology of these diseases.

Etiology

These diseases are referred to as idiopathic (cause unknown) and though the possible mechanism suggested includes genetic factors, immune mechanism, bacterial or viral agents, sugar (excess) and low fibre intake has also been implicated especially in Crohn's disease.

The symptoms, complications of inflammatory bowel disease are summarized next.

Symptoms

Inflammatory bowel diseases are associated with:

- Abdominal cramping, diarrhoea
- Steatorrhoea
- Obstruction caused due to bulky foods, and
- Malnutrition

What are the causes for malnutrition in these disease conditions? Let us find out.

Causes of Malnutrition in Inflammatory Bowel Disease

The causes of malnutrition include:

- Decreased oral intake, which can be disease induced due to abdominal pain, diarrhoea, nausea, anorexia.
- Malabsorption due to decreased absorptive surface (destruction of villi), bile salt deficiency, bacterial overgrowth and use of drugs.
- Increased secretion and nutrient losses due to GI blood losses, electrolyte, trace mineral losses.
- Increased requirements due to inflammation, fever, increased intestinal cell turnover, haemolysis.
- Drugs interference related to corticosteroids, (interferes in calcium absorption and protein metabolism), sulfasalazine (interferes in folate absorption), Cholestyramine (interferes in fat soluble vitamin absorption).

available that can give information about the level and activity of lactase enzyme. Depending on the level of activity (very low level, moderate level) the dietary treatment could be planned. Let us see how.

- *Very low level of lactase activity*: at very low level of lactase activity all milk products must be eliminated, substitutes of milk like soya milk, groundnut milk and their preparations could be given. Enzyme such as Lactaid and Maxilact are available in the market. Addition of these in the milk or milk products could digest 90% of lactose in milk and thus minimize the symptoms of lactose intolerance.

- *Moderate level of Lactase activity* : Intake of milk is restricted depending on the tolerance. Fermented and cooked form of milk should be preferred as it is better tolerated. Fermentation converts a major part of lactose to lactic acid and in cooked product lactose gets bound and the concentration reduces. It is better tolerated in the form of buttermilk, curds, custards, porridges and cottage cheese or when mixed with cereals, cocoa etc. These allow gradual lactose breakdown and decrease the symptoms of lactose intolerance. Curds are better tolerated possibly due to microbial culture that facilitates lactose digestion in the intestine. Small amount of milk can be taken with the meal.

Some important points to remember are highlighted next:

Remember

- Identify the level of lactase activities (diagnostic tests).
- Depending on the enzyme activity eliminate milk and milk products.
- Substitute milk and milk products by giving soya sources like – tofu, soymilk, soy curd and groundnut milk.
- Give a well balanced diet.
- If moderate lactase activity is present small amounts of lactose (within individuals tolerance level) can be given several times a day.
- Small amounts of milk in moderate lactose activity can be tolerated if taken with other foods e.g. after a meal or a snack.
- Curds is better tolerated than milk.
- Low lactose foods if available commercially like ice cream, cottage cheese, try them.
- Lactose enzymes are available these can be added in the milk.
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Nutritional Management: Inflammatory Bowel Disease

Adequacy of nutritional needs and minimizing stress on the inflamed or diseased segment of the bowel are the main principles of nutrition management.

To decrease eating associated symptoms and decreased bowel activity during healing, patients hospitalized for IBD (Inflammatory Bowel Disease) are placed on a "bowel rest" programme, which involves reduction in oral intake, clear liquids and low residue foods. This is normally done to achieve the following:

1. Decrease the absorptive work of the bowel and provide rest.
2. Minimize mechanical trauma caused by the passage of food.
3. Decreased diet associated secretions (acid, enzymes) that may aggravate inflammation.

The diet should be liberal in protein and calories and should be sufficient to maintain or restore weight/support growth of children and adolescents. Supplementation with multivitamin preparations (1-5 times above RDA) in necessary as this condition precipitates deficiency of many nutrients, decreases absorption and increases requirements.

Overemphasis on fibre may be avoided in patients with strictures as it may lead to blockage.

Streatorrhoea is more common in Crohn's disease due to ileal resection. This may favour calcium-fatty acid complex formation and increased excretion. It may be accompanied by magnesium (Mg) and zinc (Zn) losses. Steatorrhoea also favours increased absorption of oxalates. In addition, this state is marked with an increased binding of fatty acid to calcium and thus more oxalate is free in solution for colonic absorption. Fatty acid also increases the permeability of oxalate through colonic mucosa. Thus, a reduction in fat intake coupled with calcium, magnesium and zinc supplementation is suggested.

To help you understand the inflammatory bowel diseases better, we have a detail discussion on two of these diseases namely ulcerative colitis and small bowel syndrome. We begin with ulcerative colitis.

A. Ulcerative Colitis

Let us understand clearly about ulcerative colitis by reading the following case.

Varun, a 48-year-old male, had a very successful career in a computer company. His company was his life. He put in long hours when he was working on an important contract and seldom even took a Sunday off. He was delighted when a deal came together, and he celebrated his success at his favourite Chinese restaurant. When he worked 10-12 hours at a stretch, he just ordered his favorite Chinese food, which frequently gave him bouts of diarrhoea. But the latest episode was really bad. He felt nauseated and had cramps for 2 nights and developed a fever. On the second night, he noticed blood in the stools and he resolved to call the doctor. What do you think he might be suffering from? Well, this is the case of Ulcerative Colitis. What is it? Let us find out.

Etiology

No single etiologic factor has been identified although genetic auto-immune factors are thought to be involved. Although exacerbations are more likely during the conditions of mental conflict and emotional stress. Allergy to certain foods especially milk may be a factor in precipitating the disease.

What are the disease symptoms? Let us find out.

Symptoms

As discussed in the case study above, the common symptoms are:

1. Mild abdominal discomfort, an urgent need to defecate several times a day.
2. Diarrhoea accompanied by rectal bleeding.
3. Weight loss, dehydration, fever, anaemia and general debility.
4. Edematous and hyperemic mucosa seen in early stages.
5. In more severe disease, necrosis and frank ulceration of the mucosa occurs.

So how to manage this chronic condition? The dietary management is described next.

Dietary Management

Proper dietary management is important for maintaining a good nutritional status of the patient. Long-term management is generally required as the disease develops gradually and it takes a long time to cure this disorder. We will now learn in detail the important aspects of dietary management.

The dietary management and nutrient recommendations need individual attention depending on the extent of disease and problems of malnutrition exhibited. There is a wide range of tolerance for various foods observed from one patient to another. Let us first identify the calorie needs of the patient.

Energy: The calorie requirements must be increased to:

1) restore weight status and maintain ideal weight.
2) compensate for the elevated BMR.
3) support growth especially if the age group is adolescents. A caloric intake of 40-50 Kcal/kg IBW/day is recommended.

Proteins: Patients with ulcerative colitis lose about 4-8 g fecal N_2 as compared to the normal excretion of 2 g. In severe ulcerative colitis, 20 g N_2 (equivalent to 125 g of protein) may be lost daily. The serum albumin is low. Proteins are necessary for tissue synthesis, tissue healing and to compensate for the increased losses in stools. Thus, liberal amounts of high quality protein i.e. 1.5 g / IBW are needed to make up for the losses. Emphasis should be on tender meats, fish, poultry and eggs for those patients who are allergic to milk.

Fats: Usual foods, which contain fats (invisible or inherent fat), are permitted but not fried foods, as they are not easily digested due to liver dysfunction. Thus fats rich in medium chain triglycerides should be consumed as steatorrhoea is predominant in ulcerative colitis. Total fat intake can be kept close to 55-60 g with visible fat intake less than 25-30 g/day.

Carbohydrates: They form the easily absorbable source of energy. Bulk-producing vegetables are restricted so as to allow better intake of nourishing foods. Sugars and starches can make the increased caloric intake.

Fibre: Eliminating roughage seems to have a better effect on preventing relapses of the disease. A low residue diet may be given during an acute attack to prevent severe

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Fibre: Eliminating roughage seems to have a better effect on preventing relapses of the disease. A low residue diet may be given during an acute attack to prevent severe

bleeding during diarrhoea. Thereafter some degree of ... needed as many ulcerative colitis patients do not tolerate raw vegetables. It may cause further damage to the already inflamed mucosa. The forms, in which vegetables are given, can be changed. All kinds of irritant and spicy foods should be strictly avoided. Raw vegetables, spicy and irritant foods may be avoided.

Vitamins: Commercial multivitamin preparation should be administered orally especially the ones needed for the healing process and the utilization of calories and proteins.

Minerals: Mineral losses may be marked and unless replaced may contribute to a fatal outcome. A patient with moderately advanced ulcerative colitis passes a large volume over 400 ml of faeces per day and thus may lose considerable amount of sodium (6 g NaCl/litre of stool). Thus oral sodium intake is increased by added salt, sprinkling additional salt in foods. Potassium loss can be estimated as 30 mEq / 2.2 g of potassium chloride / litre. Usually high excretion of potassium even 167 mEq / day may sometimes be encountered. Manifestations of potassium deficiency such as weakness, hypotonia, abdominal distension and even electrocardiographic changes may occur. Oral administration of potassium salts as potassium citrate may be helpful.

Elimination of milk from the diet may call upon calcium supplementation to the extent of 400-800 mg/day. Protein to Calcium ratio is to be maintained for optimum utilization. Iron by the oral route is usually not well tolerated. Daily about 30 mg of elemental iron is given. If anaemia is marked, then blood transfusions may be given.

Fluids: A liberal intake of fluid should be given to prevent dehydration. The passage of at least 1200 ml of urine indicates that a patient is well hydrated.

We will now discuss about another inflammatory bowel disease i.e short bowel syndrome.

B. Short Bowel Syndrome (SBS)

Short bowel syndrome

IRRITABLE BOWEL SYNDROME

Introduction :- The irritable bowel syndrome is caused by an over-stimulation of intestinal nerve endings resulting in irregular contraction of the bowel. It is caused by irritation of the mucous membrane, with symptoms varying between spastic constipation & diarrhoea.

Prevalence :- This stress-related functional disorder of the intestine may occur at any age but is more frequent in women.

Aetiology :- The specific aetiology is unknown. Abnormalities in gut motility have been found, but this does not always correlate with symptoms.

The followings are the assumed to be the causes of irritable bowel

symptoms :-

→ excessive use of laxatives.
→ excessive use of antibiotics
→ excessive use of caffeine.

→ Lack of regularity in sleep & rest.

→ Lack of fluid intake.

→ Strong family history of allergy.

→ hypersensitivity to allergy/ certain foods.

→ Stressful life.

→ pscyco logical factors like.
  i) tension
  ii) nervousness ~~etc~~.
  iii) anxiety.
  iv) worry.

→ Irregular meals.

→ Smoking.

→ Drinking too much of tea, coffee & alcohol.

→ Previous gastro intestinal illness.

Clinical features / findings

→ The most common symptoms is altering diarrhea & Constipation.

→ Cramping abdominal pain, relieved by defecation or the passage of wind.

→ Altered bowel habit. (normal reflux impaired).

→ A sensation of incomplete evacuation.
→ Abdominal bloating.
→ Abdominal distention.
→ Rectal pain.
→ Excessive mucous in the stool.
→ Perception of excessive flatulence.

Dietary Managements :-

Principle :- The aim of nutritional care is to ensure adequate nutrient intake to guide the patient towards the diet that is not likely to contribute to symptoms and to explain the role of proper dietary practise for avoiding the specific gastrointestinal symptoms. The diet for the patients suffering from (IBS) should be (High Protein, high calorie, low fat and fiber rich diet.)

Certain Points That Should Be Considered While Planning the Diet for (IBS) patients are as follows :-

→ A daily fibre of 20 to 30 gms is recommended.

→ Additional fibre in the form of bulk laxatives is necessary.

→ Excessive use of dietary fat, caffeine, sugars and alcohol, and alcoholic beverages should be avoided.

→ Relaxation and stress reduction is a must.

→ Prescribing a soft low fibre diet in the earlier stages & later to a normal one.

→ Administration of liquid paraffin & a hydrophilic colloids e.g. agar / tragacanth at night.

→ Use of purgatives & enemas shd. be avoided.

→ There showld be additional amounts of bulk foods, such as fruits, vegetables, & whole grains.

During alternate periods of diarrhea or excessive flatulence the fiber content may need to be decreased

MENU

Non-Vegetarian.	Vegetarian.
Early Morning.	
• Milk/light tea/ Coffee – 1 cup.	• Milk/ light tea/ Coffee – 1 cup.
Breakfast	
• Bread with butter – 2 slices. • Fruits – 1 glass Juice. • Egg poach.	• Bread with butter – 3 slices/ • Paneer sandwich. • Fruit Juice – 1 glass
Lunch.	
• Cooked rice/ chapathi – 1 serving • Dhal soup – 1 cup. • Veg curry – 1 serving. • Fish curry/ chicken curry – 1 serving • Curd – 1 cup. • Fruit – 1 serving.	• Cooked rice/ Chapathi – 1 serving. • Dal Soup – 1 cup. • Veg Curry – 1 serving. • Milk pudding – 1 cup. • Curd – 1 cup • Fruits – 1 serv-

Tea:

- Roasted groundnut - 1 plate.
- Tea/Coffee - 1 cup.
- Fruits - 1 serving.

- Roasted groundnut - 1 plate.
- Tea/Coffee - 1 cup.
- Fruits - 1 serving.

Night

(same as lunch).

GASTRITIS (S.N)

#Def :- It is a general term for a group of conditions with one thing in common: inflammation of the lining of the stomach.

Types :- Gastritis are of 2 types.

ACUTE	CHRONIC
(that occurs suddenly)	(appears slowly over time)

In some cases Gastritis may lead to ulcers & it can increase the risk of Stomach Cancer. But mostly Gastritis improves quickly with treatment & Dietary management.

#Etiology :-

1. Regular use of pain killers.
2. Excess Alcohol consumption.
3. Irregular meals for an extend period of time.
4. Excess consumption of spicey foods.
5. " " " Junk foods.
6. Bacterial Infection.
7. Older Age.
8. Stress.
9. It may associated with medical conditions such as Crohn's Disease & parasitic infections.

(10) tobacco use.
(11) Viral infection.
(12) Autoimmune disorders.

Symptoms :-

→ Nausea.
→ Vomiting.
→ Indigestion.
→ A feeling of fullness in yours upper abdomen, particularly after eating.
→ Pain in the stomach.

Dietary Management :-

→ Bland Diet is Recommended.
→ Avoid Alcohol consumption.
→ Avoid Smoking & tobacco.
→ Eat small & frequent meals.
→ Avoid spieces & condiments.
→ Avoid fatty foods & fried foods.
→ Avoid unnecessary use of pain killers & antacids.
→ Have low acidic foods.
→ Low acidic vegetables (cucumber, white potato, carrots & low acidic fruits such as (apples, strawberries etc) are recommended.
→ Low sugar foods shd. be taken.

→ Foods rich in probiotics are recommended.
→ Rice based diet is preferred.
→ Lean meat is allowed.
→ Whole grain bread & pasta.
→ Oats, barley..
→ Soda, Carbonated beverages shd. be avoided.
→ Tomato & tomato products, pickles shd. be avoided.
→ Nuts, creamy sauces, mayonaise, packed foods, chips, smoked meats are avoided.
→ Coffee, tea, chocolates, dairy products are avoided.

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