Chapter 4

Patient Education for Acute Diseases

Introduction

The health care persons (like General Healthcare Assistants-GHAs) come in contact with patients and their friends/attendants/relatives in their day to day working. Often, we have to interact with them and guide them. That means, we have to provide education for the patients (**patient education**) about the health problems they are having. This helps them manage their problem better. To enable this, we need to have **some elementary knowledge of common diseases**. This chapter deals with some common acute diseases namely, dental diseases, diarrhoea, vomiting, upper respiratory tract infection, swine flu, acute bronchitis, skin diseases, jaundice, stroke, typhoid and malaria. The causes, symptoms, treatment and preventive measures of these diseases have been discussed.

Objectives

After reading this chapter you will be able to:

- Know about causes, symptoms, prevention and control of common acute diseases
- Provide patient education for these diseases

4.1 Patient Education

Patient education is a continuous process and can not be completed in one or two sessions. Education should be provided to patients of all age groups and to the parents of very young children. Sufficient time and dedication is essential for each patient. Patients and parents should be actively involved in the programme and should be encouraged to express their expectations, fears and concerns. All their queries must be answered in a sympathetic manner at every visit.

All topics to be dealt should be covered in a stepwise manner keeping in mind the patient's learning capacity, educational and socio-economic status. Patients should not be choked with too much information at one sitting only. Education should be tailored according to the patient's needs and should be relevant, realistic and repetitive. A number of studies have emphasised the importance of reinforcement of spoken messages with audio-visual support for better results. In addition to doctor-patient interaction, every effort should be made for patient-patient interaction during the education sessions.

4.2 Dental Diseases

Dental diseases are a group of diseases involving teeth and their surrounding structures. It's important to take care of our mouth and teeth, starting from our childhood. If we don't, we could have problems with our teeth and gums - like cavities in our teeth or even loss of teeth.

Causes of Dental Diseases

- Lack of proper dental hygiene.
- Not brushing teeth after eating sticky sweets.
- Improper brushing of teeth.
- Frequent use of sugary snacks.
- Smoking tobacco or use of tobacco in any other form.
- Lack of flourine in drinking water.

Symptoms of Dental Diseases

- Pain in teeth/gums
- Difficulty in chewing food
- Foul smell in mouth
- Swelling of the gums
- Cavities in teeth/food particles get stuck.
- Bleeding from the gums
- Loosening of teeth
- Deformity of teeth
- Brown spots in teeth

Types of Dental Diseases

Fig: Scurvy: it causes bleeding from gums and swollen gums.

Tooth decay (cavities in the teeth or **dental caries**) is a common problem among people of all ages. For children, **untreated cavities** can cause pain in teeth leading to inability to attend the school, difficulty in concentrating on learning, etc. These are problems that greatly affect the quality of our life and our ability to succeed in life.

Periodontal (gum) disease affects gums, commonly due to infection caused by bacteria that enter the gum tissue. This destroys the gums and jaw bone. Teeth become loose and chewing becomes difficult. Teeth may need to be extracted by the dentist.

Scurvy is a disorder caused by deficiency of vitamin C. It can cause swollen and bleeding gums, loosening of the teeth, and stiffness of the joints. It can also lead to slow wound healing and anemia.

Management of Dental Problems

Dental diseases need early diagnosis and management, if we have to prevent loss of teeth and their associated problems. Pain in teeth can be controlled by use of pain killers. **Dental infection** can be controlled by use of antibiotics. Tooth decay is managed by **filling up of cavities** or removal of loose teeth. **Scurvy** is treated or prevented by consuming enough Vitamin C, which is present in fruits and vegetables. Dental hygiene is very important. Proper brushing of teeth is essential for dental health. Periodic checkup by dental surgeon is useful.

Prevention of Dental Diseases

Here's how to keep your mouth and teeth healthy :

- Brush your teeth twice daily (preferably after every meal); use soft brush with rounded bristles.
- Rinse mouth well after every meal.
- Limit sugary snacks (especially sticky ones).
- Get enough calcium/milk.
- Don't smoke or chew tobacco.
- Take balanced diet.
- Drink milk.
- Regular dental check up.

4.3 Diarrhoea

Diarrhoea is the passage of 3 or more loose or liquid stools per day, or more frequently than is normal for the individual.

Acute diarrhoea is an abrupt onset of increased fluid content of stool above 10 ml/kg/day and increased frequency. Diarrhoea is considered **chronic** when it lasts longer than 14 days.

Fig: *Feeding ORS to a baby in diarrhoea.*

Fig: *Proper mixing of ORS is important.*

Causes of Diarrhoea

Acute diarrhoea is usually a symptom of **gastrointestinal infection**. Infection can be caused by a variety of bacterial, viral and parasitic organisms. Rotavirus is a common cause in children under the age of five years. Various bacteria like Salmonella (Typhoid bacilli), Vibrio cholerae, E. coli can cause diarrhoea. Parasites like amoebae, round worms can also cause diarrhoea. **Campylobacter** are a common cause of bacterial diarrhoea. Infection spreads through contaminated food or water, or from person to person as a result of poor hygiene. In some persons, acute diarrhoea can be due to use of some medicines.

Chronic diarrhoea is often due to non-infectious causes (e.g. ulcerative colitis, malabsorption etc.).

Classification of Diarrhoea

Diarrhoea may be classified as:

1. **Secretory diarrhoea**

   Secretory diarrhoea means that there is an increase in the active secretion, or there is an inhibition of absorption. There is little or no structural damage. The most common cause of this type of diarrhoea is a cholera toxin that stimulates the secretion of anions, especially chloride ions. Therefore, to maintain a charge balance in the lumen, sodium is carried with it, along with water. Secretory diarrhoea is characterized by the absence of fever and prominent nausea/vomiting with watery stools that persist when fasting.

2. **Osmotic diarrhoea**

   Osmotic diarrhoea occurs when too much water is drawn into the bowels. This can be the result of maldigestion (e.g. pancreatic disease or coeliac disease) in which the nutrients are left in the lumen to pull in water. Osmotic diarrhoea can also be caused by osmotic laxatives (which work to alleviate constipation by drawing water into the bowels). In healthy individuals, too much magnesium or vitamin C or undigested lactose can produce osmotic diarrhoea and distention of the bowel.

3. **Exudative diarrhoea**

   Exudative diarrhoea occurs with the presence of blood and pus in the stool. This occurs with inflammatory bowel diseases, such as Crohn's disease or ulcerative colitis, and other severe infections.

4. **Inflammatory diarrhoea**

   Inflammatory diarrhoea occurs when there is damage to the mucosal lining of intestines which leads to a passive loss of protein-rich fluids, and a decreased ability to absorb these lost fluids. Features of all three of the other types of diarrhoea can be found in this type of diarrhoea. It can be caused by bacterial infections, viral infections, parasitic infections, or autoimmune problems such as inflammatory bowel diseases. It can also be caused by tuberculosis and colon cancer.

Symptoms and Signs of Diarrhoea

Increase in the frequency of stools as described above is the main symptom. Viral gastroenteritis symptoms begin abruptly with diarrhoea, nausea, vomiting, headache, low-grade fever and abdominal cramps. The abdomen is diffusely mildly tender, and bowel sounds are hyperactive. Small bowel diarrhoea is characterized by passage of large loose stools, and with periumbilical pain. Large bowel diarrhoea has frequent passage of small stools, with tenesmus (cramping pain around anal region).

Severe diarrhoea may be life-threatening, particularly in young children and in people who are malnourished. In severe cases, loss of fluid and salts like sodium and potassium can cause convulsions, paralysis of limbs and can interfere with normal functioning of heart. With dehydration, eyes can be sunken, pulse may be feeble. Patient may pass less and less urine and the urine flow may be suppressed totally. If some of these signs are present, it indicates that the patient needs special care.

Symptoms that begin within 6 hours of eating suspect food suggest a preformed toxin of Staphylococcus aureus. Classic food poisoning develops, with acute nausea, vomiting, cramps, and diarrhoea 2 to 6 hours after eating food that has spoiled due to lack of refrigeration. Symptoms starting from 8 to 14 hours after taking contaminated food occur with Clostridium perfringens, and over 14 hours from viral agents or bacterial contamination of food with E. coli. Invasive infection with exudative diarrhoea is associated with systemic symptoms, fever, chills, and blood, pus, and proteinaceous material in the stools. It is most commonly found with infections such as Salmonella, Shigella, Campylobacter, or Enterohemorrhagic E. coli. Bloody diarrhoea usually indicates invasive infection.

Giardia infection causes mild diarrhoea with cramping and gas is a frequent presentation. Heavy small bowel infection may produce loose, watery or greasy, foul, yellow stools (steatorrhoea) and mucus, without blood. Malabsorption with significant weight loss often occurs when symptoms persist for more than 10 days.

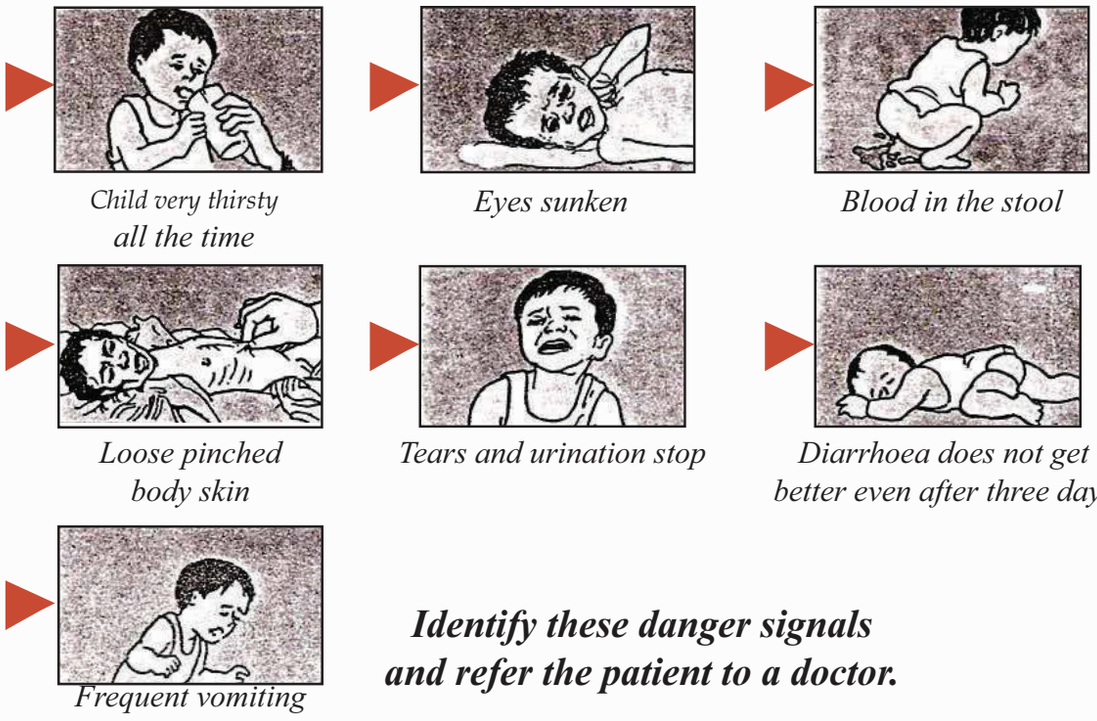


Fig: Danger signals of diarrhoea: *identify these danger signals and refer the patient to a hospital urgently.*

Typhoid fever: "Pea soup" diarrhoea may develop in the third week of an illness characterized by progressive fever, rose spots (evanescent transcent red rash on abdomen and enlarged spleen).

Cholera: A spectrum of diarrhoea from mild to severe gray, watery, "rice water" stools with fluid losses in excess of 1 liter/hour may occur.

Management

Most cases of acute diarrhoea are self-limited.

Symptomatic treatment for diarrhoea involves the patient consuming adequate amounts of **water to replace fluid loss (Oral Rehydration Therapy)**.

Oral Rehydration Therapy (ORT)

Oral Rehydration Therapy is at the core of management of diarrhoea. It includes:

- Oral Rehydration Salt (ORS) solution
- Sugar salt solution
- Food based solutions e.g. dal water, rice water, coconut water, lemon water, soups etc.

Oral Rehydration Salts is the name for a balanced glucose electrocyte mixture used as a drug for treatment of clinical dehydration. ORS solution is absorbed in the small intestines even during copious diarrhoea, thus replacing the water, electroytes lost in the stools. It contains sodium chloride, potassium chloride, sodium citrate and glucose. It is dissolved in water to provide ORS solution. Its functions are:

- Glucose facilitates the absorption of sodium and hence water.
- Sodium and potassium are needed to replace body losses.
- Citrate corrects the acidosis that occurs due to diarrhoea.

The following types of diarrhoea **require medical supervision**:

- Diarrhoea in infants and in young children,
- Severe diarrhoea,
- Diarrhoea associated with blood,
- Diarrhoea that continues for more than two days, and
- Diarrhoea that is associated with fever, dehydration, or weight loss.

Prevention and Control of Spread of Diarrhoea

Diarrhoea can easily spread from a patient to another person. To prevent and control diarrhoea, **following measures are to be adopted:-**

1. Always wash hands with soap and water before cooking, before eating food or after visit to toilet.
2. Do not eat stale, rotten food, raw and unwashed vegetables/fruits, and food exposed to dust or flies.
3. Use safe water for drinking.
4. Wash utensils with clean water.
5. Use boiled milk.
6. Keep food covered so that flies cannot sit over it.
7. Keep your surroundings clean so that flies cannot breed.
8. Maintain proper personal hygiene.
9. Sanitary disposal of excreta; avoid open field defecation.
10. Get immunized against typhoid and cholera.

Remember:

- Diarrhoea can be prevented by maintaining personal cleanliness.
- It can spread quickly from one person to another.
- Give plenty of fluids to drink as soon as diarrhoea starts.

4.4 Vomiting

Vomiting involves forcing of the contents of stomach up, through the esophagus and out of the mouth. **Nausea** is the sensation of having an urge to vomit.

Vomiting is a forceful action. It is accomplished by a downward contraction of the diaphragm. At the same time, the abdominal muscles tighten against a relaxed stomach with an open sphincter. The contents of the stomach are propelled up and out.

Causes of Vomiting

Vomiting a complex and coordinated reflex, which is controlled by the **vomiting centre of the brain**. The vomiting centre of brain causes vomiting by responding to signals coming from different areas of the body like:

- The mouth, stomach and intestines;
- The bloodstream (which may contain medicines or infections);

- The balancing systems - (the cochlea in the ear which causes motion sickness); and
- The brain itself (including unsettling sights, smells, or thoughts).

A variety of stimuli can trigger vomiting (from migraine to kidney stones). In most cases, it is due to a **viral gastrointestinal infection.**

Management of Vomiting

Most of the time, nausea and vomiting do not require urgent medical attention. However, if the symptoms continue for long, or if the person cannot keep any food or fluids in the stomach, medical attention is required.

Dehydration is the main concern with most vomiting. It is important to keep the person hydrated. **Try to give small amounts of clear liquids** (such as electrolyte solutions). Don't give too much of liquid at one time. Stretching the stomach can make nausea and vomiting worse. **Avoid solid foods** until there has been no vomiting for six hours. Then, work slowly back to a normal diet. If vomiting persists, one may require replacement of fluids through **intravenous route**.

Urgent medical attention is required, if:

- Vomiting is severe; or
- if vomit contains blood or bile; or
- if the patient has severe abdominal pain, headache, stiff neck or signs of dehydration (sunken eyes, feeble pulse, less urine and loose pinched body skin).

A number of medicines are effective at preventing vomiting.

Advice to Person having Vomiting

- Take steady, small amounts of clear liquids like dal water.
- Use home made oral rehydration solutions/WHO approved ORS.
- Continue feeding.
- Avoid solid foods until there has been no vomiting for 6 hours.
- Work solwly back to normal diet.
- Maintain food hygiene.
- If vomiting persists, seek doctor's advice..
- See doctor if vomit contains blood or person has headache or signs of dehydration.

4.5 Cough And Upper Respiratory Infection

Cough

It is a reflex that keeps our throat and airways clear. Although it can be annoying, coughing helps our body to heal or protect itself. Cough can be either acute or chronic. **Acute cough** begins suddenly and usually lasts not more than 2 to 3 weeks. Acute cough is the kind we most often get with a cold or flu.

Upper Respiratory Tract Infection (URTI)

It is an acute infection, involving upper respiratory tract i.e. nasal cavity, pharynx and trachea. It causes nasal stuffiness and increased nasal secretions, thereby causing difficulty in breathing. It may also be associated with cough and fever. It usually lasts less than 7 days. It is usually caused by inhalation of viruses (like Rhinovirus or influenza virus) present in the air. The viruses spread from person to person when they are released through sneezing and coughing.

Prevention

There are some things people can do to protect themselves from URTI:

- Avoid close contact with infected persons.
- Avoid crowded places.
- Proper hygiene (like covering nose and mouth with cloth while coughing or sneezing).
- Wash hands often and keep them away from your face. Most germs are spread from your hands to your mouth or your hands to your nose.
- Immunisation as per the National Immunisation Schedule.
- Stay out of crowds, especially in the winter when more people have colds.
- Exercise at least every other day.
- Eat a healthy and balanced diet.
- Get enough sleep of 6-8 hours each night.
- Drink at least 8 cups of fluids each day.
- As much as you can, stay out of places with more air pollution. Avoid places with very dirty air (such as traffic jams, parking garages), dusty work areas and smoke filled rooms where strong chemicals and household products (like cleaners, paints, glue and aerosol sprays) are being used.

Treatment

It is usually self limiting. Steam inhalations, nasal decongestants and analgesics (to control body pains and fever) may be given. Antibiotics (not required in most cases) may be given, if needed. Use household remedies for relief. If cough persists for more than 2 weeks, get sputum examination done.

4.6 H1N1 Infection [Swine Flu]

Swine flu or H1N1 infection is a viral infection. It was originally observed in pigs, hence the name swine flu. In humans, it manifests as fever, running nose, cough and in severe cases, as breathlessness. In late March and early April 2009, cases of human infection with this H1N1 virus were first reported in Southern California and Texas (USA).

On June 11, 2009, WHO raised a worldwide pandemic alert that a **global pandemic** of a new influenza strain called **Influenza-A(H1N1)** was underway. All states in U.S.A. have since reported cases of H1N1 flu infection in humans. In India, there were nearly 50 deaths in humans from swine flu till August, 2009, particularly from Maharashtra, Karnataka and Delhi.

How Swine Flu Spreads

H1N1 Influenza Viruses are responsible for the disease. H1N1 flu viruses **do not normally infect humans**. However, sporadic human infections with H1N1 flu have occurred. Most commonly, these cases occur in persons with **direct exposure to pigs** (e.g. children in contact with pigs or workers in the swine industry).

Human-to-human transmission of H1N1 flu can also occur. This happens in the same way as seasonal flu occurs in people (through coughing or sneezing of people infected with the influenza virus). People may also become infected if they touch something with flu viruses on it and then touch their own mouth or nose.

Symptoms and Diagnosis

The symptoms of H1N1 influenza include fever, lethargy, lack of appetite and coughing. Some people also report runny nose, sore throat, nausea, vomiting and diarrhoea. Severe cases can have breathlessness and may result in death. To diagnose H1N1 influenza infection, a **respiratory specimen** (like nasal swab) is needed. Specific tests for presence of virus are conducted in specialized laboratories.

Vaccination and Treatment for H1N1 Virus in Humans

H1N1 influenza vaccine is available against H1N1. One dose is required for persons 10 years or older and 2 doses at 4 weeks interval for children 6 months to 9 years. Antiviral

drugs (like Tamiflu) can make this illness milder. They also prevent serious influenza complications. Antiviral drugs work best if started as soon after getting sick as possible. They might not work if started more than 48 hours after illness starts.

Prevention

There are **everyday actions** people can take to stay healthy. They include frequent hand washing, covering the nose and mouth when we cough or sneeze, and avoiding close contact with sick people. **Influenza antiviral drugs** also can prevent influenza when they are given to a person who has been in contact with a person having H1N1 influenza. When used to prevent the flu, antiviral drugs are about 70% to 90% effective.

4.7 Acute Bronchitis

Acute bronchitis is the swelling and irritation in the **small air passages** in the lungs, due to acute infection. When the airways are irritated, thick mucus forms in them. **The mucus plugs up the airways**. It becomes hard for air to get into lungs. Symptoms of bronchitis include cough that produces mucus (called sputum), difficulty in breathing and a feeling of tightness in the chest.

Symptoms of Acute Bronchitis

- Fever,
- Cough with sputum,
- Shortness of breath,
- Wheezing, and
- Body aches.

Causes of Acute Bronchitis

Acute bronchitis is almost always caused by **viruses that attack the lining of the bronchial tree** and cause infection. As our body fights back against these viruses, more swelling occurs and **more mucus is produced**. It takes time for body to kill the viruses and heal the damage to bronchial tubes.

In most cases, the same viruses that cause cold, cause acute bronchitis. Bacterial infections also can cause acute bronchitis. The viruses that cause acute bronchitis are sprayed into the air (or, onto people's hands) when they cough. We can get acute bronchitis if we breathe in these viruses.

If we smoke **tobacco** or are exposed to **damaging fumes** (e.g. those from factories), we are more likely to get acute bronchitis.

Management of Acute Bronchitis

Most cases of acute bronchitis will improve on their own after a few days or a week. Bed rest is useful. **Intake of good amount of water** and **steam inhalations** help in liquefying the thick mucus. This helps in opening of air passages. It is best not to suppress a cough that brings out mucus, because this type of cough helps clear the mucus from our bronchial tree faster. Since **acute bronchitis is usually caused by viruses**, antibiotics usually do not help.

Some people who have acute bronchitis need **medicines that are usually used to treat asthma**. If we hear wheezing, this indicates the need for asthma medicines. These medicines can help open the bronchial tubes and clear out mucus. They are usually given with an **'inhaler'**. An inhaler sprays the medicine right into the bronchial tree. So, the medicine works faster. Also, very small amount of medicine is enough, if given by inhaler.

Prevention of Acute Bronchitis

- Avoid smoking tobacco.
- Avoid crowded places.
- Use hand kerchiefs (or hand) in front of mouth, while coughing.
- Avoid damp, cold and polluted areas.

4.8 Skin Diseases

Skin disorders are common in childhood, as young skin is very sensitive. Some common skin rashes in children are those associated with infectious diseases such as **chickenpox and measles**.

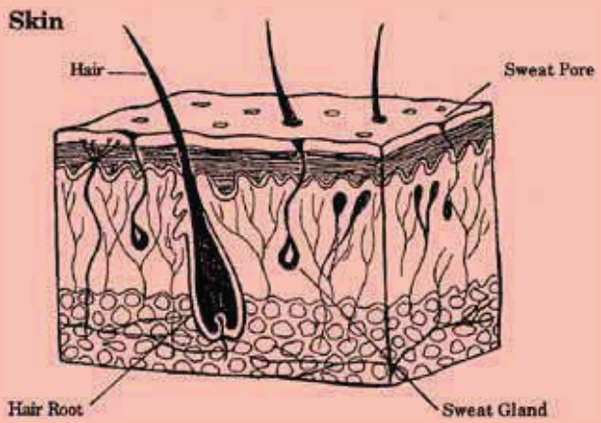


Fig: *Structure of Skin.*

Other skin disorders may be the result of local bacterial infection, allergies, insect bites, sunburn or irritation (for example, by chemicals in detergents). Most skin disorders are minor and usually clear up rapidly. Impetigo, scabies, boils, fungal infection, infected wounds, allergy, and acne are some common skin disorders.

For **prevention** of skin diseases:

- Maintain good personal hygiene.
- Avoid allergens.
- Practice proper hand washing.
- Avoid sharing of towel, clothes.
- Avoid injuries.

Impetigo

This is bacterial infection that causes rapidly spreading sores with **shiny yellow crusts**. It often occurs on children's faces, especially around the mouth. Impetigo can spread easily to other people from the sores or from contaminated fingers.

Treatment of Impetigo

- Wash the affected part with soap and boiled water, gently soaking off the crusts.
- Paint the sores with **gentian violet** or spread an **antibiotic cream** such as polysporin.
- If the infection is spread over a large area or causes fever, the patient needs antibiotics.

Prevention of Impetigo

Improve the patient's personal cleanliness. Bathe the child daily. Protect from bedbugs and biting flies. If the child has scabies, treat as soon as possible. Do not let a child with impetigo sleep or play with other children. Begin treatment at the first sign.

Scabies

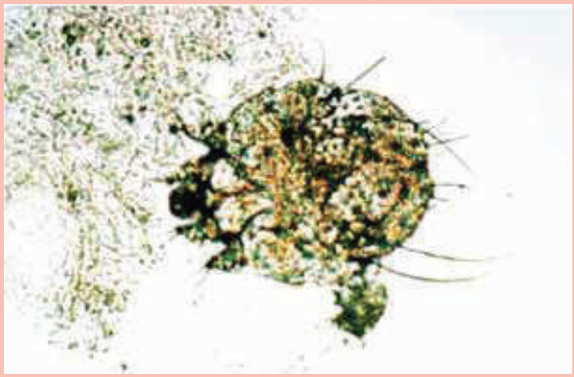
Scabies is a skin infection that is caused by Sarcoptes Scabei, a type of mite. Scabies mites make burrows in our skin and live under the outer layer of skin. It causes pimple-like irritations known as the **scabies rash**. These mites lay eggs under the skin and feed on our blood. The mites are about the size of a pinhead, are nearly transparent. So, they cannot be seen by our naked eye. Scabies is a highly contagious disease.

Symptoms of Scabies

The most common symptom of scabies is **extreme itching, particularly at night**. The skin becomes red and blistered. The itching is the result of an allergic reaction of our body to the mites (and their wastes). Irritation of skin specially between joints of fingers may be there.

The **areas of skin affected by scabies** include: between the toes and fingers, around the wrist, folds of the elbow, armpits, beltline, genitalia, buttocks, and the groin. Babies and small children may get it even on the face and scalp. The symptoms usually appear from two to six weeks after becoming infested.

Scabies rash on legs



Mite causing scabies

Scabies rash on back

Scabies rash between fingers

Fig: *Mite causing scabies and some common sites of scabies.*

Transmission of Scabies

Scabies is transferred by **direct skin-to-skin contact**. It can also spread by contact with clothes or bedding contaminated by infected person. A very common way to get scabies is to shake hands with an infected person. It can also be transmitted during sexual contact. We cannot get scabies from our pets. Scabies mites infest only the humans. Scabies mites can only survive for three or four days, if they are away from human body. The patient can spread scabies until all the mites and eggs are killed by treatment.

Scabies Treatment

Start treatment immediately. The longer you wait, the more the mites will spread. Everyone living with an infected person, as well as intimate contacts, should be treated. They should be **treated at one go (at the same time) to prevent re-infestation with scabies** from other persons. Some of them might be infected, but may not have symptoms yet. Apply medication all over the body more so on affected parts after a scrub bath.

Also, the infected person's **clothing and bedding** need to be washed in hot water and ironed, so as to kill the mites and their eggs. Dry the clothing/bedding in direct sunlight. Proper personal hygiene should be maintained.

Permithrin cream is a very safe and effective scabies treatment. This treatment kills the scabies mites and their eggs. It will end the itching and stop the pain and sores.

Boils

Boil is a skin disease caused by infection of hair follicles, resulting in the localized accumulation of pus and dead tissue. A boil generally starts as a reddened, tender area. Over time, the area becomes firm, **hard and tender** [painful to touch and pressure]. Eventually, the center of the abscess softens and becomes filled with infection-fighting white blood cells that the body sends from the bloodstream to eradicate the infection. This collection of white blood cells, bacteria, and proteins is known as **'pus'**. Finally, the pus **"forms a head,"** which can be surgically opened. Or, it bursts and spontaneously drains out, through the surface of the skin.

Types of Boils

There are several types of boils. Among these are:

- **Furuncle** and **carbuncle**: Furuncle is a localized infection in the skin caused by the bacterium **Staphylococcus aureus**. Individual boils can cluster together and form an **interconnected network of boils** called **'carbuncles'**. It can have one or more openings onto the skin. It may be associated with fever or chills. Carbuncles occur in diabetics.

- **Cystic acne**: This is a type of abscess that is formed when **oil ducts** (present in the skin) become clogged and infected. Cystic acne affects deeper skin tissue than the more superficial inflammation from **common acne**. Cystic acne is most common on the face and typically occurs in the **teenage years.**

Causes of Boils

There are many causes of boils. Some boils can be caused by an ingrown hair. Others can form as the result of a splinter or other foreign material that has become lodged in the skin. Other boils, such as those of acne, are caused by plugged sweat glands that become infected.

Symptoms of Boils

Boils are red, pus-filled lumps that are tender, warm, and extremely painful. A **yellow or white point** at the center of the lump can be seen, when the boil is ready to drain or

Fig: *Boil with visible pus.*

Fig: *Boils in arm pit.*

discharge pus. An abscess is also a collection of pus; however, it can occur anywhere in the body. A boil always involves a **hair follicle**.

In a severe infection, **multiple boils** may develop. The patient may experience fever and swollen lymph nodes (e.g. in groin or arm pit). A recurring boil is called **chronic furunculosis. Risk factors for developing boils** include poor hygiene, diabetes mellitus, obesity and malnutrition. In some people, itching may develop before the lumps begin to

form. Boils are most often found on the back, stomach, underarms, shoulders, face, lip, eyes, nose, thighs and buttocks. Sometimes boils exude an unpleasant smell, particularly when discharge is present (due to the presence of bacteria in the discharge).

Management of Boils

Care of skin and treatment of underlying disorder (like diabetes) help in control of infection. Antibiotics may be needed in some cases. **Skin hygiene** is most important in preventing development of boils.

Infected Wounds

The skin is an essential part of our immune defense against materials and microbes that are foreign to our body. Any **break in the skin**, such as a cut or scratch, can develop into an abscess, if it becomes infected with bacteria. Health care persons should take special care to see that if they are wounded, the wounds (e.g. scratches) are not infected.

Advice to person having infected wounds

- Maintain good personal hygiene.
- Start treatment immediately.
- Proper hand washing with soap.
- Avoid sharing of towel and clothes.
- Proper washing of clothes and bedding.
- Dry clothing and bedding in direct sunlight.

4.9 Jaundice

An increase in the level of **'bilirubin'** in blood can cause the disease, **jaundice**. It manifests as **yellowish discoloration of conjunctiva of eye**. In severe cases, yellowish discoloration of skin can also occur. This discoloration is known as icterus or jaundice. The term Jaundice derives from the French word "jaune" (which in English means yellow).

Generally, the normal presence of bilirubin in plasma is 0.5 mg/dL. But when a person suffers from this disease, this level shoots up to **1.5 mg/dL or higher**, manifesting as **yellowish discoloration of eyes, urine and skin**.

Causes of Jaundice

Bilirubin is essential for digesting food properly. It is secreted from gall bladder. However,

excess bilirubin can cause jaundice. If **red blood cells** do not complete their average life span, they are broken down to bilirubin in the liver. This excess breakdown of red blood cells in turn causes jaundice. Jaundice is commonly caused by viruses, spread through contaminated food, water or blood.

At times, **side effects of some drugs** can cause this disease. People who consume **alcohol** regularly are susceptible to this disease. Malfunctioning of liver resulting in increased bilirubin level can also cause this malady. **Blockage of liver ducts** can force bilirubin to bounce back into the blood and it can also cause this disease. Gallstones can create this kind of problem. **Incompatibility of rhesus blood group** can also cause jaundice.

Symptoms of Jaundice

The eyes become yellow. Skin may become yellow in severe cases. One can experience an itchy feeling in skin. Yellowing of skin may start from the face. Patient will have decreased appetite, yellowish discoloration of urine and easy fatigability. If a **new born baby** is affected by this disease, the parent will observe that the baby is not feeding properly and is sleeping most of the time.

Management for Jaundice

There is no well defined cure. However, proper rest and intake of food, containing high carbohydrates (like sweets) are helpful. **Eating green vegetables and fruits** can help jaundice patients to recuperate from this disease. Drink 2.5 liters to 3 liters of water on a regular basis. Avoid alcohol, and junk foods. The improvement in jaundice can be monitored by change in patient's bilirubin level in blood. If a new born child is attacked by this disease, **phototherapy** (light therapy) can cure that child from Jaundice.

4.10 Stroke [Brain Attack]

A **'stroke'** is the **sudden death of a portion of the brain cells**, due to lack of oxygen. A stroke occurs when blood flow to a part of the brain is impaired. This results in abnormal brain function. Blood flow to the brain can be impaired by blockage or rupture of an artery that supplies blood to the brain.

What Causes a Stroke?

Blockage of an artery in the brain by a blood clot is called **thrombosis**. It leads to deprivation of blood and oxygen to that portion of the brain. This causes a stroke. A clot usually forms in a blood vessel that has been previously narrowed, due to **atherosclerosis** (hardening of the artery).

When a **blood clot** or a piece of **atherosclerotic plaque** (cholesterol and calcium deposits

on the wall of the artery) lodges in an artery of the brain, it blocks the flow of blood that supplies oxygen. **'Cerebral hemorrhage'** occurs when a blood vessel in the brain bursts and blood enters into the surrounding brain tissue. This too can lead to stroke.

All the above causes of stroke lead to lack of oxygen to the brain tissue and its death.

Risk Factors for Stroke

People having the following are more likely to suffer from an attack of stroke:-

- Hypertension (high blood pressure)
- Tobacco smoking/chewing
- Diabetes mellitus
- High alcohol intake
- Dental infections
- High level of cholesterol in blood
- Obesity

Stroke can be prevented by controlling these risk factors. Regular exercises are useful.

Symptoms of Stroke

The most common symptom is sudden onset of weakness or paralysis of one side of the body. Patient may not be able to voluntarily move the leg or arm. Sensation may be lost in a leg or arm. A stroke can result in speech problems. It weakens the muscles of the face. Numbness or tingling can occur. A stroke can cause unconsciousness.

How is a Stroke Diagnosed?

A stroke is a medical emergency. We should suspect stroke when people suddenly suffer from:-

- Weakness of right or left half of body
- Slurring of speech
- Sudden onset of unsteady gait
- Sudden onset of unconsciousness, preceded by headache

They should be taken to a medical facility immediately for evaluation and treatment. **Viral encephalitis** can cause symptoms similar to those of a stroke, but it is usually associated with fever. Diagnosis of stroke may be confirmed by CT scan or MRI of brain.

Management of Acute Stroke

Acute stroke is a medical emergency. The patient should be transported to a hospital, where facilities for management of acute stroke are available. **Airway, breathing and circulation [ABC]** are to be maintained. Avoid dehydration and sudden fall of blood pressure. Look for diabetes or infection (they need specific treatment). CT scan/MRI scan of brain can help in assessing the extent of damage and the nature of damage to the brain. Antiplatelet drugs (e.g. aspirin), will be useful in cases of stroke caused by blockage of vessels. Regular physiotherapy helps in early recovery.

4.11 Typhoid Fever

Typhoid fever is a life-threatening illness caused by the bacterium **Salmonella typhi**. Typhoid fever is still common in the developing countries, where it affects about 20 million persons each year.

How Typhoid Fever Spreads

Salmonella typhi lives only in humans. Persons with typhoid fever carry this bacteria in their bloodstream and in their intestinal tract. A small number of persons, called **carriers**, recover from typhoid fever but continue to carry the bacteria. Both typhoid patients and carriers pass S. typhi in their faeces (stools). Once S. typhi bacteria are eaten or drunk by us, they multiply in the intestines and spread into our bloodstream.

We can get typhoid infection if we eat food or drink beverages that have been handled by a **person who is shedding S. typhi** in his/her faeces. Also, we get infected if **sewage** contaminated with S. typhi bacteria gets into the water we use. Therefore, typhoid fever is more common in localities where:-

- hand washing is less frequent and
- water is likely to be contaminated with sewage.

Symptoms of Typhoid

Fever, abdominal pain, loose motions, generalized weakness and vomiting can occur. In severe cases, there can be perforation of intestine, convulsions and coma.

Tests

Presence of typhoid infection is confirmed by blood and stool culture for isolation of Salmonella typhi organisms. Blood examination, called **widal test**, is done from second week of typhoid fever to detect antibodies to S. typhi.

Treatment and Prevention

Bed rest, cold sponging to control fever and specific drugs (like ciprofloxacin), to kill S. typhi organisms are indicated.

Two basic actions can protect us from typhoid fever:

- Avoid risky foods and drinks that may be contaminated with S. typhi;
- Follow proper hygiene.

Remember the following:-

- Eat foods that have been thoroughly cooked.
- Avoid **raw vegetables and fruits** that cannot be peeled or washed properly with safe water. Some vegetables like lettuce get easily contaminated. It is very important to wash them well.
- Avoid foods and beverages from **street vendors**. It is difficult for food to be kept clean on the street. Many travelers get sick by eating food bought from street vendors.
- Avoid **flavored** ices. That ice may have been made with contaminated water.
- **Get vaccinated** against typhoid fever, during the times when you are excessively exposed to contaminated food or water.

4.12 Malaria

Malaria is an infection, caused by a parasite called Plasmodium. It is transmitted to us by bites of infected mosquitoes. In the human body, the parasites multiply in the liver; and then they infect our red blood cells.

Causes of Malaria

Malaria is caused by a one-celled parasite called plasmodium. Female Anopheles mosquitoes pick up the parasite from infected people whom they bite to obtain blood needed to nurture their eggs. Inside the mosquito, the plasmodium parasites begin to reproduce. When the mosquito bites another person, the parasites mix with its saliva and pass into the blood of the person being bitten. Malaria parasites multiply rapidly in the liver and then in red blood cells.

Life Cycle of Malaria Parasite

1. A **female Anopheles mosquito** carrying malaria-causing parasites feeds on humans and injects the parasites in the form of **sporozoites** into the bloodstream.

The sporozoites travel to the liver and invade liver cells.

2. Over 5-16 days the sporozoites grow, divide, and produce tens of thousands of haploid forms, called **merozoites**. Some malaria parasite species remain dormant for extended periods in the liver, causing relapses weeks or months later.

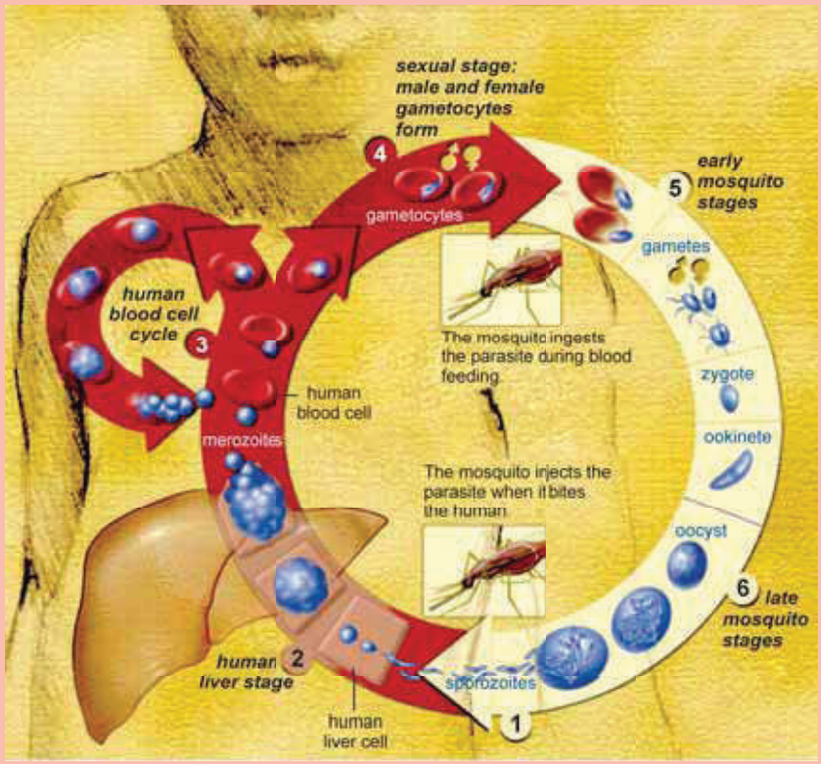


Fig: *Life Cycle of the Malaria Parasite.*

3. The **merozoites exit the liver cells** and re-enter the bloodstream, beginning a cycle of invasion of red blood cells, asexual replication, and release of newly formed merozoites from the red blood cells repeatedly over 1-3 days. This multiplication can result in thousands of parasite-infected cells in the host bloodstream, leading to illness and complications of malaria. This can last for months, if not treated.

4. Some of the **merozoite-infected blood cells** leave the cycle of asexual multiplication. Instead of replicating, the merozoites in these cells develop into sexual forms of the parasite, called **male and female gametocytes**, that circulate in the bloodstream.

5. When a mosquito bites an infected human, it ingests the **gametocytes**. In the mosquito gut, the infected human blood cells burst, releasing the gametocytes, which develop further into mature sex cells called gametes. Male and female gametes fuse to form diploid zygotes, which develop into actively moving

ookinetes that burrow into the mosquito midgut wall and form oocysts.

6. Growth and division of each **oocyst** produces thousands of active haploid forms called **sporozoites**. After 8-15 days, the oocyst bursts, releasing sporozoites into the body cavity of the mosquito. From there, they travel to and invade the mosquito's salivary glands.

7. The cycle of human infection re-starts when the mosquito takes a **blood meal**, injecting the sporozoites from its salivary glands into the human blood stream.

Symptoms of Malaria

One to two weeks after a person is infected, the first symptoms of malaria appear: fever, headache, chills and vomiting. If not treated promptly with effective medicines, malaria can kill by infecting and destroying red blood cells and by clogging the capillaries that carry blood to the brain or other vital organs. Malaria may cause **anemia and jaundice** (yellow coloring of the skin and eyes) because of the loss of red blood cells.

There are **four types of malaria**: Plasmodium vivax, P. malariae, P. ovale and P. falciparum. **Falciparum malaria is the most deadly type**. If not promptly treated, it can cause kidney failure, seizures, mental confusion, coma, and death.

Because the malaria parasite is found in red blood cells of an infected person, malaria can also be transmitted through **blood transfusion**; use of **needles or syringes contaminated with blood**.

Management of Malaria

A drop of blood is examined under the microscope for the presence of malaria parasites. **Anti-malarial drugs** like quinine, chloroquine are useful. Reduction of fever by cold sponging is helpful. Patient should take plenty of fluids.

4.13 Acute Abdomen

The term **acute abdomen** refers to a sudden, severe abdominal pain that is less than 24 hours in duration. It is in many cases a medical emergency, requiring urgent and specific diagnosis. Several causes of acute abdomen need surgical treatment. **The causes of acute abdomen** include acute appendicitis, acute peptic ulcer (and its complications), bowel perforation, intestinal obstruction and stones in common bile duct or in urinary tract.

Symptoms of Acute Abdomen

Acute abdomen usually manifests as sudden onset of pain abdomen, vomiting and constipation. Patient may experience difficulty in urination, restlessness and distension of abdomen. Abdominal X-ray, ultrasound examination and CT scan of abdomen are useful

in making diagnosis of what exactly is causing the pain in abdomen.

Management of Acute Abdomen

Acute abdomen is a medical emergency. Patient needs to be referred to a hospital at the earliest. Some patients may require immediate surgery (like in cases of appendicitis, bowel perforation etc.).

Questions

1. Mention causes of dental diseases.
2. List the symptoms of dental diseases.
3. What advice will you give to school children for prevention of dental diseases?
4. Mention the causes of diarrhoea.
5. Explain the measures to be adopted for prevention and control of diarrhoea.
6. What health education would you give to a person who is vomiting?
7. List the common causes of cough.
8. What advice would you give to a person who is having cough?
9. Give symptoms of H1N1 influenza.
10. Explain the management of acute bronchitis.
11. What advice would you give to a person with scabies?
12. Mention the causes and risk factors of stroke.