Symptoms and treatment profile of diarrheal disease below six month infants with or without antibiotic admitted to, Institute of Child Health and Shishu Sasthya Foundation Hospital (ICH & SSF)

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Symptoms and treatment profile of diarrheal disease below six month infants with or without antibiotic admitted to, Institute of Child Health and Shishu Sasthya Foundation Hospital (ICH & SSF)

A Research paper submitted to the Department of Pharmacy, East West University in conformity with the requirements for the degree of Bachelor of Pharmacy.

A collaborative study between Department of Pharmacy, East West University and Institute of Child Health and Shishu Sasthya Foundation Hospital (ICH & SSF)

This thesis paper is dedicated to my parents,
dear Beauty apu & Babu Bhaiya

CERTIFICATE

This is to certify that the thesis "Symptoms and treatment profile of diarrheal disease below six months infants with or without antibiotic admitted into Institute of Child Health and Shishu Sasthya Foundation Hospital" (ICH & SSF), submitted to the Department of Pharmacy, East West University, Mohakhali, Dhaka in partial fulfillment of the requirements for the degree of Bachelor of Pharmacy (B.Pharm) was carried out by Dilruba Akhter (ID: 2003-2-70-010) under our guidance and supervision and that no part of the thesis has been submitted for any other degree. We further certify that all the Sources of information and laboratory facilities availed of this connection is duly acknowledged.

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ABSTRACT

Symptoms and treatment profile of diarrheal disease below six month infants with or without antibiotic admitted to Institute of Child Health and Shishu Sasthya Foundation Hospital (ICH & SSF)

Diarrhea is one of the principal causes of morbidity and mortality among children in the developing world and is the second leading killer of children under the age of five years, accounting for approximately 1.6 million deaths annually. An estimated 17 percent of the annual 10.8 million deaths in children aged less than five years are estimated to be caused by diarrhea. While international programs encouraging the use of oral rehydration therapy (ORT) and other interventions have helped to lower these rates, diarrheal disease remains a very serious public health issue for children across the globe. Recently, strong evidence demonstrating the effectiveness of new, low osmolarity ORS and zinc supplementation catalyzed an international call to action urging countries to adopt new treatment guidelines and increase efforts to improve ORS coverage. At the end of 2007, 34 *Countdown* priority countries had adopted both new guidelines and 17 more had adopted one or the other.

The aim of this study was to get information of young children below six months with diarrhoea admitted to Institute of Child Health and Shishu Sasthya Foundation Hospital (ICH & SSF) about their symptoms and treatment profile. Hospital records of eighteen children aged below six months admitted to ICH & SSF reviewed for the purpose of getting information about the symptoms and treatment profile for those infants. The common symptoms of the study infants were loose watery stool, fever, cough, vomiting, swelling, etc. Most of the patients were treated with KOLORIDE infusion which is a balanced combination of electrolytes, ORS and some patients were kept under NPO (nothing per oral) for sometime. Among 18 patients, only 2 children received antibiotic therapy. The common antibiotics used for treating the patients were ciprozoid (ciprofloxacin) and Civox (ciprofloxacin). The result of this study shows that the symptoms of the patients disappeared after receiving the appropriate treatment.

Chapter 1

1.1 Introduction:

Globally 4.5 million small children died because of infections in 1982. Diarrheal diseases, respiratory infections, and malnutrition are predisposing factors to infections. Diarrhea can be watery and dysenteric causing loss of body water. Oral rehydration therapy (ORT) prevented 700,000 deaths in 1986 period. Improved case management can prevent deaths: nutrition both during and after an episode of diarrhea, appropriate use of medications, antimicrobial agents in cholera, and factors that protect against enteric infections (gastric acid) (Taylor CE, Greenough WB 3rd., 1989).

The world's leading cause of death among children is the groups of infections that are lumped together because they share the common symptom of diarrhea. Together they were estimated in 1982 to be causing over 1 billion episodes of illness and an estimated 4.5 million deaths in small children (Synder, J.D., 1982).The diarrheal disease and acute respiratory infections interact with malnutrition so that the most of the deaths occur not because of an event but from a downward spiraling sequence of multiple synergistic combinations (Behar 1968; Scrimshaw, 1968).

Few health problems are influenced as much as by multicausality as the diarrheal diseases. Although most diarrheal diseases attack are acute diarrheas. Identifying and ranking the major health problems may be done, in defined age groups, by the use of objective measures of the burden of death or illness attributable to specific diseases care, it must not only be a major cause of sickness and death but it must also be controllable at a reasonable cost. Diarrheal disease mortality can be effectively reduced at reasonable cost by oral dehydration (Mahalanabis, 1981) and possibly other measures.

1.1.1 INTERVENTIONS FOR DIARRHOEAL DISEASE CONTROL

In circumstances where diarrheal diseases have been identified as a priority health problem, and a commitment has been made to combat the problem, it is necessary to decide how to reduce the mortality and morbidity they cause.

The Diarrheal Diseases Control (CDD) Programme of the World Health Organization has, since its inception in 1978, advocated the following four-part strategy for diarrhea control:

- improved case management, with particular emphasis on the early use of oral rehydration therapy in acute diarrhea and on appropriate feeding during illness and convalescence;
- improved maternal and child health care, with particular emphasis on breast-feeding, weaning practices, personal and domestic hygiene, and maternal nutrition;
- improved use and maintenance of drinking water and sanitation facilities, and improved food hygiene;
- Detection and control of epidemics.

In the first years of the CDD programme , greatest emphasis was placed upon oral rehydration as the primary intervention, greatest emphasis was reducing diarrheal disease mortality among young children (Snyder, 1982). With the implementation of CDD programme in over 35 countries, it is now appropriate to supplement the emphasis on oral rehydration by developing, in detail, other interventions for diarrhea control and undertaking the necessary field research and evaluation to establish their feasibility and cost-effectiveness.

The CDD programme has therefore undertaken a systematic and comprehensive review of the effectiveness, feasibility and cost of the many possible anti diarrhea interventions available for the reduction of morbidity and/or mortality among children under 5 years of age.

The use of oral rehydration solution (ORS) has revolutionized the management of acute diarrhea. The implementation of the standard World Health Organization ORS (WHO-ORS) has resulted in decreased mortality associated with acute diarrheal illnesses in children, although in general stool volume and diarrhea durations are not reduced. Decreased morbidity and mortality have occurred because of improved hydration status. Decreased morbidity has also been described in adults who used this therapy. Various modifications to the standard ORS have been derived. These modifications have included

hypo-osmolar or hyperosmolar solutions, use of rice-based ORS, zinc supplementation, and the use of amino acids, including glycine, alanine, and glutamine (Atia AN, 2009).

1.1.2 INTERVENTIONS FOR DIARRHOEAL DISEASE CONTROL

Potential interventions for reducing diarrheal morbidity or mortality among children less than five years of age:

I. By case management

A. Oral rehydration therapy

1. Administration of oral rehydration in the home.
2. Administration of oral rehydration at a medical facility.

B. Non-oral rehydration therapy

1. Administration of rehydration by intravenous or other routes at a medical facility.

C. Appropriate feeding

1. Promoting the appropriate feeding of children during diarrheal illness and convalescence.

D. Chemotherapy

1. Administration of therapeutic agents in the home.
2. Administration of therapeutic agents at a medical facility.

II. By increasing host resistance to infection and/or illness and/or death

A. Maternal nutrition

1. Improving prenatal nutrition to reduce the incidence of low birth-weight.
2. Improving prenatal and postnatal nutrition to improve the quality of breast milk.

B. Child nutrition

1. Promoting exclusive breast-feeding up to age 4-6 months and partial breast-feeding thereafter.

2. Improving weaning practices for children aged 4-18 months (introducing non-milk foods not later than the sixth month, continuing breast-feeding for as long as possible and using nutritious and locally available weaning foods).

3. Supplementary feeding to improve the nutritional status of children aged 6-59 months.

4. Promoting the use of growth charts by mothers as an aid to proper child nutrition and child care.

C. Immunization

1. Rotavirus and/or cholera immunization (when effective and tested vaccines are available) of the child and/or mother.

2. Measles immunization to reduce measles-associated diarrhea.

D. Chemoprophylaxis

1. Chemoprophylaxis of children at special risk, such as contacts of known cases, to reduce the incidence and/or severity of diarrhea.

III. <u>By reducing transmission of the pathogenic agents of diarrhoeal diseases</u>

A. Water supply and excreta disposal

1. Constructing water supplies that improve the quality and availability of water for domestic purposes, and improved excreta disposal facilities; and providing the necessary educational support to ensure use and maintenance of these new facilities.

B. Personal and domestic hygiene

1. Promoting specific features of personal and domestic hygiene, such as hand-washing, by appropriate educational campaigns.

C. Food hygiene

1. Promoting improved practices for the preparation and storage of foods, both commercially and in the home, and especially emphasizing the hygienic preparation of weaning foods.

D. Control of zoonotic reservoirs

1. Control of infection of domestic and farm animals by pathogens causing diarrhea in man.

E. Fly control

1. Control of flies, especially flies breeding in association with human or animal faeces.

IV. By controlling and/or preventing diarrhoea epidemics

A. Epidemic surveillance, investigation and control

1. Improving the ability to identify and investigate an epidemic early in its course and the capacity to implement effective control activities. (SYNDER, 1982)

Diarrheal diseases are the major cause of sickness and death among young children in most developing countries. Recent estimates show that diarrheal disease cause nearly 5 million deaths per year in children under 5years old in developing countries(excluding china)where in every100 children in this age group there are, on average,220 diarrheal episodes 1.4 deaths from diarrhea every year (SNYDER ,1982).A systemic review of potential interventions for the control of diarrheal diseases was initiated by WHO in 1982 (Feachem RG ,1983)

Diarrhea is a condition in which the sufferer has frequent and watery bowel movements. Symptomatic treatment for diarrhea involves the patient consuming adequate amounts of water to replace that lost, preferably mixed with electrolytes to provide essential salts and some amount of nutrients. For many people, further treatment and formal medical advice is unnecessary.

Following types of diarrhea generally indicate medical supervision is desirable:

- Diarrhea in infants.
- Moderate or severe diarrhea in young children.
- Diarrhea associated with blood.
- Diarrhea that continues for more than 2 weeks.
- Diarrhea that continues for more than two days;
- Diarrhea that is associated with more general illness such as non-cramping abdominal pain, fever, weight loss, etc;
- Diarrhea in travelers, since they are more likely to have exotic infections such as parasites;

- Diarrhea in food handlers, because of the potential to infect others;
- Diarrhea in institutions such as hospitals, child care centers, or geriatric and convalescent homes.A severity score is used to aid diagnosis in children. (Ruuska T, 1990)

In this study, we concern about the significance role of antibiotic for the symptoms and treatment in diarrheal patients of about below six months infants.

1.1.3: The gastrointestinal tract or alimentary tract:

The **digestive tract** (also known as the **alimentary canal**) is the system of organs within multicellular animals that takes in food, digests it to extract energy and nutrients, and expels the remaining waste. The major functions of the GI tract are ingestion, digestion, absorption, and defecation. The GI tract differs substantially from animal to animal. Some animals have multi-chambered stomachs, while some animals' stomachs contain a single chamber. In a normal human adult male, the GI tract is approximately 6.5 meters (20 feet) long and consists of the upper and lower GI tracts. The tract may also be divided into foregut, midgut, and hindgut, reflecting the embryological origin of each segment of the tract. (Jean Hopkins, 1993).

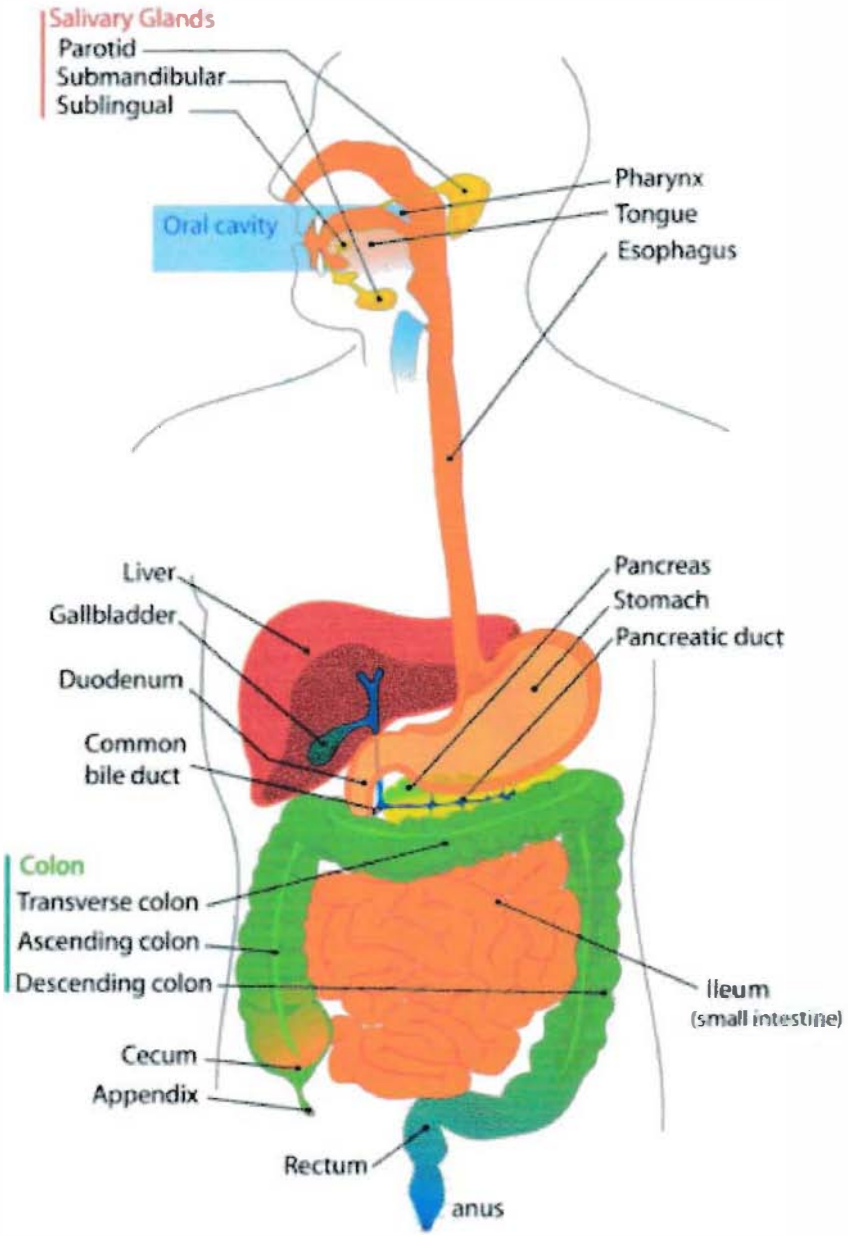

Fig1: Upper and Lower human gastrointestinal tract

Source: http://en.wikipedia.org/wiki/Gastrointestinal_tract

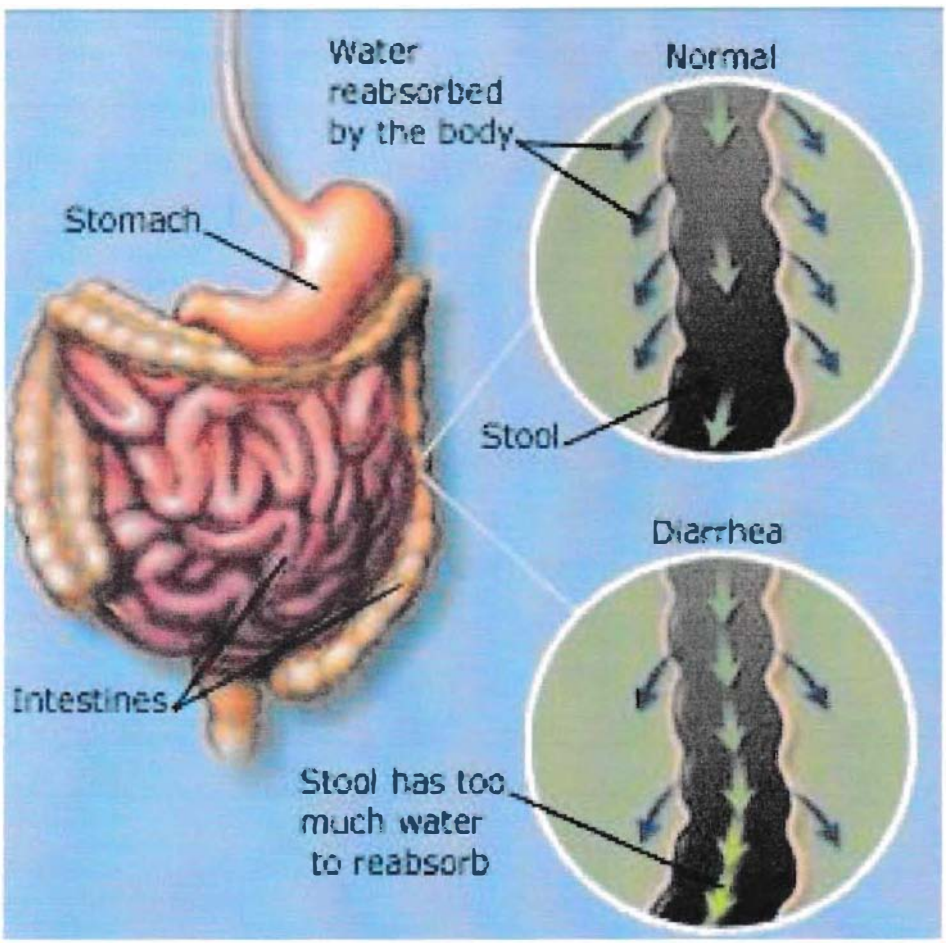

Fig2: Diarrheal stool condition:

Source: http://health.cd-writer.com/c4/p170/images/diarrhea_images_and_videos.html

1.1.4. Definition of diarrhea:

The number of stools normally passed in a day varies with the diet and the age of the child. In diarrhea, stools contain more water than normal — they are often called loose or watery stools. They may also contain blood, in which case the diarrhea is called dysentery. Diarrhea is most common in children, especially those between 6 months and 2 years of age. It is also common in babies under 6 months who are drinking cow's milk or infant feeding formulas. Frequent passing of normal stools is not diarrhea .Babies who are breastfed often have stools that are soft; this is not the diarrheal stool (Who guideline, 2004).

1.1.4.1 Infant Diarrhea

Signs of diarrhea in infants may include such things as an increased number of bowel movements that may appear with other symptoms often caused by infections (such as acting tired, or having a fever). One of the most common causes of diarrhea among infants is viral gastroenteritis (the "stomach flu"). When it occurs in an infant, diarrhea can present special health concerns; infants with diarrhea can become dehydrated in a short period of time. Using oral rehydration solutions can help prevent or treat dehydration while the infant recovers (Arthur Schoenstadt MD, 2009).

1.1.4.2 Causes of Diarrhea:

Diarrhea may be caused by a temporary problem, like an infection, or a chronic problem, like an intestinal disease. A few of the more common causes of diarrhea are -

Table 1: Possible causes of sudden onset (acute) diarrhea

Cause	Features	Treatment
Infectious diarrhea		
Viral infection	Loose stool, low-grade fever, feel ill	None, usually resolves within 48 hours
Bacterial infection	Fever (temperature >101°F or 38.4°C), bloody stools	Usually none, antibiotics in selected situations
Parasite	Not common in developed countries, may be seen in returning traveler or camper	Antibiotics in most cases
Non-infectious diarrhea		
Antibiotics	Loose stool begins after antibiotic started, usually resolves with a few days after stopped	Usually none
Food intolerance (eg, lactose intolerance)	Diarrhea, abdominal pain, and/or gas after consuming food	Determine if food intolerance is the cause
Inflammatory bowel disease (eg, Crohn's disease, ulcerative colitis)	Mouth sores, diarrhea, abdominal pain, weight loss, and fever	See a healthcare provider for full evaluation and treatment
Irritable bowel syndrome	Chronic lower abdominal pain, diarrhea and/or constipation	Symptomatic treatment
Celiac disease (gluten sensitivity)	None to diarrhea, weight loss, abdominal pain, gas	Complete avoidance of wheat, rye, barley

Source: http://www.utdol.com/online/content/image.

1.1.4.3 **Causes of diarrhea:**

Many things can cause diarrhea, which can make diagnosis complex. A list of established causes of diarrhea is as follows:

- **Infectious diseases**
  - Viral Infection
    - Norwalk Virus of Caliciviruses
    - Rotavirus
    - Adenoviruses
  - Bacterial Infection
    - Salmonella
    - Shigella
    - Campylobacter
    - Vibrio cholerae
    - Entero-Aggregative Escherichia coli
    - Entero-Toxic Escherichia coli
    - Yersinia enterocolitica
    - Vibrio parahemolyticus
  - Protozoal Infection
    - Giardia lamblia
    - Entamoeba histolytica
    - Blastocystis
    - Dientamoeba fragilis
    - Cryptosporidium
    - Isospora
    - Cyclospora
    - Toxoplasmosis
    - Malaria

1.1.4.3 **Causes of diarrhea:**

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    - Shigella
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    - Entero-Aggregative Escherichia coli
    - Entero-Toxic Escherichia coli
    - Yersinia enterocolitica
    - Vibrio parahemolyticus
  - Protozoal Infection
    - Giardia lamblia
    - Entamoeba histolytica
    - Blastocystis
    - Dientamoeba fragilis
    - Cryptosporidium
    - Isospora
    - Cyclospora
    - Toxoplasmosis
    - Malaria

- Multicellular Parasitic Diseases
  - Ascaris
  - Trichuris
  - Strongyloides
  - Filariasis
  - Toxocara
  - Echinococcosis
  - Cysticercosis
  - Tapeworms
  - Trematoda - Intestinal, lung, liver flukes
  - Schistosoma
  - Hookworm, pinworm
- Fungal Diseases
  - Candida

- Ischemic colitis
- Radiation colitis
- Secretory diarrhea
- Irritable bowel syndrome
- Laxative abuse
- Congenital syndromes (chloridorrhea)
- Bacterial toxins
- Drugs and poisons
- Binge drinking
  - Too many fluids in little time, e.g., Tea, Water are the main problems.

- Neuroendocrine tumors
- Neoplasia
    - Colorectal cancer
- Addison's disease
- **Non-infectious**
    - Lactose intolerance
    - Pancreatic disease
    - Short bowel syndrome
    - Postgastrectomy syndrome
    - Hyperthyroidism
    - Cholestasis
    - Celiac disease (gluten intolerance)
    - Other malabsorption syndromes
    - Inflammatory bowel disease
    - Alcoholism (Kruszka PS, 2002).

Diarrhea can also spread from person to person, aggravated by poor personal hygiene. Food is another major cause of diarrhea when it is prepared or stored in unhygienic conditions. Water can contaminate food during irrigation, and fish and seafood from polluted water may also contribute to the disease.

In many cases, the cause of diarrhea cannot be found. As long as diarrhea goes away on its own, an extensive search for the cause is not usually necessary.

People who visit foreign countries are at risk for traveler's diarrhea, which is caused by eating food or drinking water contaminated with bacteria, viruses, or, sometimes, parasites. Traveler's diarrhea is a particular problem for people visiting developing countries. Visitors to the United States, Canada, most European countries, Japan,

- An inability to control the bowels (fecal incontinence)
- Feeling sick to the stomach
- Fever
- Chills
- Muscle aches or pain
- Headache
- Low heart rate
- Joint pain
- Alternating constipation
- Blood in stool
- Mucus in stool.

1.1.4.6. TYPES OF DIARRHEA

Diarrhea in Children

Children can have acute (short-term) or chronic (long-term) forms of diarrhea. Causes include bacteria, viruses, parasites, medications, functional disorders, and food sensitivities. Infection with the rotavirus is the most common cause of acute childhood diarrhea. Rotavirus diarrhea usually resolves in 5 to 8 days.

Medications to treat diarrhea in adults can be dangerous to children and should be given only under a doctor's guidance.

Diarrhea can be dangerous in newborns and infants. In small children, severe diarrhea lasting just a day or two can lead to dehydration. Because a child can die from dehydration within a few days, the main treatment for diarrhea in children is rehydration.

Clinical types of diarrhea diseases

It is most practical to base treatment of diarrhea on the clinical type of the illness, which can easily be determined when a child is first examined. Laboratory studies are not needed. Four clinical types of diarrhea can be recognized, each reflecting the basic underlying pathology and altered physiology:

- Acute watery diarrhea (including cholera) which lasts several hours or days: the main danger is dehydration; weight loss also occurs if feeding is not continued;

- Acute bloody diarrhea (also called dysentery): the main dangers are intestinal damage, sepsis and malnutrition; other complications, including dehydration, may alsooccur;

- Persistent diarrhea (which lasts 14 days or longer): the main danger is malnutrition and serious non-intestinal infection; dehydration may also occur;

- Diarrhea with severe malnutrition (marasmus or kwashiorkor); the main dangers are: severe systemic infection, dehydration, heart failure and vitamin and mineral deficiency.

Acute diarrhea

This may defined as diarrhea that lasts less than 2 weeks, and is also called gastroenteritis.

This can nearly always be presumed to be infective although this is proven in a minority of cases. It is often reasonable to reassure a patient, ensure adequate fluid intake and wait and see. In more severe cases or where it is important to find the cause of the illness, so stool cultures should be done. The most common organisms found are Campylobacter (an

organism of animal or chicken origin), salmonella (also often of animal origin), Cryptosporidiosis (animal origin), Giardia Lamblia (lives in drinking water). Shigella (dysentery) is less common and usually human in origin. Cholera is rare in Western countries. It is more common in developing countries and is usually related to contaminated water. *E Coli* is probably a very common cause of diarrhea. The types of *E.coli* vary from area to area and country to country. Viruses, particularly rotavirus is common in children. Toxins and food poisoning can cause diarrhea. Parasites and worms sometime cause diarrhea but often present with weight loss, irritability, rashes or anal itching. The commonest is pinworm. Other worms such as hook worm, ascaris and tapeworm are more medically significant and may cause weight loss, anemia, general unwellness and allergic problems. Amoebic dysentery due to *Entaeomeba histolytica* is an important cause of bloody diarrhea.

Chronic diarrhea

Chronic diarrhea has two classes: Those are

a) Infective
b) Non infective

a) Infective diarrhea

It is not uncommon for diarrhea to persist. Diarrhea due to some organisms may persist for years without significant long term illness. More commonly a diarrhea will slowly ameliorate but the patient becomes a carrier. Parasites should always be treated. Salmonella is the most common persistent bacterial organism in humans.

Parasitic Diarrhea:

Etiology of diarrhea may be infectious or non-infectious presenting with acute (<7 days) or chronic (>7 days) symptoms. Parasites are an infrequent or rare cause of acute diarrhea

- 5-15% in preschool age children attending day care
- 1-2% in adults

Giardia lamblia is the most common, followed by *Cryptosporidium spp* or *Entamoeba histolytica*

1.1.4.7. Why is diarrhea dangerous?

Diarrhea causes rapid depletion of water and sodium - both of which are necessary for life. If the water and salts are not replaced fast, the body starts to "dry up" or get dehydrated. If more than 10% of the body's fluid is lost death occurs.
Severe dehydration can cause death. 20% of all childhood deaths are caused by diarrhea and dehydration. For small children, severe diarrhea can be fatal within 24 hours.
If the child is vomiting, there is an increased chance of severe dehydration.
Decreased urination is a danger sign. Blood or mucus in the stool is also a danger sign.

Fever	**Pain**	**Many loose stools**
Lethargy	**Nausea**	**Mucus & Blood**
		No Urine

Diarrhea and Dehydration can be fatal over several hours!

Fig 3: Picture of Diarrheal Dehydration and other symptoms.

Source:http://hetv.org/resources/diarrhoea/diarrhoea-flipbook.htm

Despite many advances, diarrheal diseases and the resulting dehydration are responsible for about 2.2 million child deaths every year. Of these, approximately

- 50% are due to watery diarrhea and occur
  - either because of lack of access to ORS and/or health facilities,
  - or because of incorrect case management (home or health facility).

- The remainders are accounted for by persistent diarrhea (approximately 35%) and dysentery (approximately 15%).

Diarrhea is caused by bacteria or viruses. Children who are malnourished suffer much more; in turn, diarrhea weakens children and makes them more malnourished.

Diarrhea is also a major cause of child malnutrition.

1.1.4.8. Causes of diarrheal death:

65% of all child deaths are from the 3 causes:

- Acute Respiratory tract Infections now kills 3.6 million children each year.
- Diarrheal diseases are responsible for about 2.2 million child deaths every year.
- Immunization preventable diseases: measles, tuberculosis, tetanus, diphtheria, polio, and pertussis are responsible for some 2.1 million child deaths every year. Of these, almost 1 million are attributed to measles.

The common thread that links these infectious diseases is the nutrition of the mother and child. Malnutrition predisposes children to disease, and diseases often result in worse nutritional status, and consequently a vicious cycle of cause and effect is established.

The main causes of diarrhea are poor personal and food hygiene and lack of clean drinking water.

1.1.4.9. Prevention of Diarrheal Disease:

Diarrhea can be prevented by pursuing multicultural efforts by:

- improving access to clean water and safe sanitation
- promoting hygiene education
- exclusive breast-feeding
- improved weaning practices
- immunizing all children; especially against measles
- using latrines
- keeping food and water clean
- washing hands with soap (the baby's as well) before touching food
- And by sanitary disposal of stools.

The above is most important message that can help parents, governments and communities to prevent almost all of these deaths and most of the malnutrition caused by diarrhea.

The key factors **are unclean water, dirty hands at mealtime** and **spoilt food.**

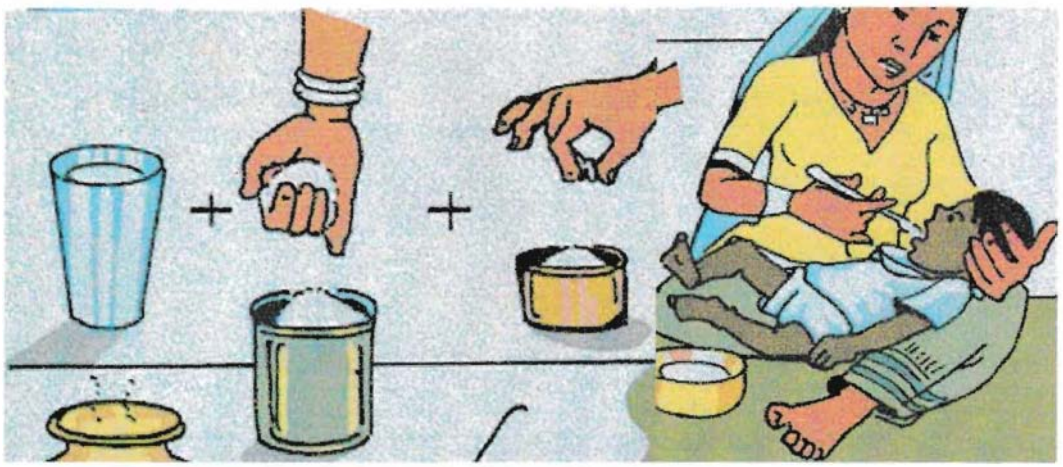
1.1.4.10. Prevalence of Diarrhea:

The infectious agents that cause diarrhea are present or are sporadically introduced throughout the world. Diarrhea is a rare occurrence for most people who live in developed countries where sanitation is widely available, access to safe water is high and personal and domestic hygiene is relatively good. World-wide around 1.1 billion people lack access to improved water sources and 2.4 billion have no basic sanitation. Diarrhea due to infection is widespread throughout the developing world. In Southeast Asia and Africa, diarrhea is responsible for as much as 8.5% and 7.7% of all deaths respectively. Amongst the poor and especially in developing countries, diarrhea is a major killer. In 1998, diarrhea was estimated to have killed 2.2 million people, most of whom were under 5 years of age (Bull World Health Organ, 2005). Each year there are approximately 4 billion cases of diarrhea worldwide.

1.1.4.11. Treatment:

In most cases, replacing lost fluid to prevent dehydration is the only treatment necessary. Medicines that stop diarrhea may be helpful in some cases, but they are not recommended for people whose diarrhea is from a bacterial infection or parasite--stopping the diarrhea traps the organism in the intestines, prolonging the problem. Instead, doctors usually prescribe antibiotics. Viral causes are either treated with medication or left to run their course, depending on the severity and type of the virus.

The list of treatments mentioned in various sources for Diarrhea includes the following list. Always seek professional medical advice about any treatment or change in treatment plans.



Treatment
Continue Feeding
Give fluids
Give ORS (fist sugar, pinch salt, 1 glass water)

Fig 4: picture of treatment on primary requirement during diarrhea

- Newborns and infants require very special care because dehydration can be dangerous
- Children need special attention as many medications may be inappropriate
- Watchful waiting - sometimes diarrhea is not serious enough to need significant treatment.
- Anti-diarrheal medications
    - Immodium AD
- Dehydration prevention treatments - one of the most important treatment aspects of diarrhea is avoiding dehydration (or treating it), particularly for infants, children and the elderly.

- Water - but not enough alone, need electrolytes as well.
- Fluids - broth or soups (for salt/sodium)
- Fruit juices
- Soft fruits
- Vegetables (for potassium)
- Infant rehydration solutions - special medications containing the required electrolytes

    - Pedialyte
    - Ceralyte
    - Infalyte

- Vitamin B3 - possibly used for related vitamin B3 deficiency
- Vitamin A - possibly used for related vitamin A deficiency
- Vitamin B6 - possibly used for related vitamin B6 deficiency
- Vitamin B12 - possibly used for related vitamin B12 deficiency

Two recent advances in managing diarrheal disease —
newly formulated oral rehydration salts (ORS) containing lower concentrations of glucose and salt, and success in using zinc supplementation — can drastically reduce the number of child deaths. The new methods, used in addition to prevention and treatment of dehydration with appropriate fluids, breastfeeding, continued feeding and selective use of antibiotics will reduce the duration and severity of diarrheal episodes and lower their incidence. Families and communities are key to achieving the goals set for managing the disease by making the new recommendations routine practice in the home and health facility.

Acute respiratory infections	25%
Diarrhoea	23%
Malaria	4%
Measles	5%
HIV/AIDS	10%
Perinatal	15%
Other	18%
Deaths associated with malnutrition	54%

Major causes of death among children under five in developing countries (*The World Health Report 2003*, WHO).

Treatment for Infant Diarrhea

Infants with diarrhea present special concerns because of their smaller body size. This small body size puts them at greater risk for dehydration from diarrhea. Therefore, treatment for infant diarrhea is focused on preventing, or if necessary, treating symptoms (such as dehydration) that occur as a result of the diarrhea.

Preventing or treating dehydration in infants focuses on replacing lost fluid and electrolytes (sodium and potassium). Administering special fluids by mouth (oral rehydration therapy) is the most effective way of doing this. Oral rehydration treatments (such as Pedialyte® or Infalyte®) prevent most dehydration. These special fluids can be found in most pharmacies or grocery stores and can be purchased without a prescription.

Rehydration fluids have a brief shelf life. Once a bottle has been opened or a mix prepared, it must be used or thrown out within 24 hours because bacteria rapidly grow in the solution. An infant could easily drink three or four bottles of the fluid during an illness.

Parents should also remember that oral rehydration therapy will not stop the diarrheal illness. In fact, the infant may have even more episodes of diarrhea until the illness runs its course.Remember, never restrict fluids when your child has diarrhea.

Other Suggestions for Treating Diarrhea in Infants

Besides making sure that your infant is adequately hydrated, other treatment suggestions for infant diarrhea include the following:

- Allow the gastrointestinal tract to settle for a few hours by not feeding your infant.
- If vomiting is also a problem, have the infant sip small amounts of clear liquids, or suck on ice chips.
- Do not give your infant any diarrhea medicine unless your healthcare provider specifically recommends that you do so.
- After several hours, if your infant is eating solids, gradually reintroduce food, starting with bland, easy-to-digest food, like applesauce, strained bananas, strained carrots, rice, mashed potatoes, or corn.
- If your infant is on formula, after being given electrolyte fluids for four to six hours, he or she will be hungry. So begin him or her on full-strength formula. Offer it more frequently than you normally do. If your infant is on cow's milk-based formula, if the diarrhea is severe, and has lasted more than three days, talk to your healthcare provider about switching to a soy formula for two weeks while the intestines have time to heal. Intestines that have been damaged by severe diarrhea cannot digest cow's milk.
- Breast-fed infants should continue nursing. You should increase the frequency of feeding, though. If your infant has signs of dehydration, follow the rehydration suggestions above. If your infant is too weak to feed, call your healthcare provider. Your infant may need to have fluids administered through an IV.

- Don't forget the bottom. Diarrhea can cause all sorts of problems to your infant's skin. Make sure to change diapers frequently. You can rinse the infant's bottom

with water, air-dry, and use protective creams, such as Desitin® or petroleum jelly. Also, cut down on baby wipes.

- Since diapers can be a mess, use disposable "nighttime" diapers to cut down on cleanup time. Make sure that they have good elastic around the legs. This is not the time to experiment with a new type of diaper.

1.1.4.12. Transmission and Prevention of Diarrhea in Infants

- The viruses and bacteria that can cause diarrhea in children are highly contagious and can spread easily from person to person. The viruses that cause diarrhea in children are often found in the stool or vomit of infected people. Diarrhea transmission can happen in one of several ways, including:
- Eating foods or drinking liquids that are contaminated with a diarrhea virus or bacteria
- Having direct contact with another person who is infected and showing symptoms (for example, when caring for someone with the illness, or sharing food or eating utensils with someone who is ill)
- Touching surfaces or objects contaminated with a diarrhea virus or bacteria and putting one's hands in one's mouth.

Infants can spread diarrhea both before and after they become sick. They can sometimes pass the virus to other members of the family and to close contacts.

1.1.4.13. Dehydration in Diarrhea

Dehydration occurs when the body has lost too much fluid and electrolytes (the salts potassium and sodium). The fluid and electrolytes lost during diarrhea need to be replaced promptly--the body cannot function properly without them. Dehydration is particularly dangerous for children, who can die from it within a matter of days.

The degree of dehydration is graded according to signs or symptoms that reflect the amount of fluid lost:

-In the early stages of dehydration, there are no signs and symptoms.

-as dehydration increases, signs and symptoms develop. Initially these include: thirst, restless or irritable behavior, decreases skin turgor, sunken fontanelle(in infants).

- In severe dehydration, these effects become more pronounced and the patient may develop evidence of hypovolaemic shock, including: diminished conciousness,lack of urine output , cool moist extremities , a rapid and feeble pulse,low or undetectable blood pressure, and peripheral cyanosis. Death follows soon in rehydration is not started quickly (Bull World Health Organ, 2005).

Chapter 2

Aim of the Study

Diarrhea is one of the principal causes of morbidity and mortality among children in the developing world and is the second leading killer of children under the age of five years, accounting for approximately 1.6 million deaths annually. An estimated 17 percent of the annual 10.8 million deaths in children aged less than five years are estimated to be caused by diarrhea.

We conducted a systematic review to evaluate the symptoms and treatment profile of diarrheal disease in infants below 6 months of age. All of them are admitted in child health and shisu sasthya foundation hospital, Mirpur. Among 18 infants only two received antibiotic therapy.

The objective of the study was to describe the symptoms and treatment profile of infants less than 6 months of age with or without antibiotic admitted to Child Health and Shishu Sasthya Foundation Hospital.

Significance of the study:

Diarrheal diseases in the developing world continue to cause significant morbidity and mortality, especially when associated with malnutrition (Bern C, 1992). In 1982, on the basis of a review of active surveillance data from studies conducted in the 1950s, 1960s and 1970s, it was estimated that 4.6 million children died annually from diarrhea (Snyder JD, 1982).

Since 1993 more complex methodologies have been applied to a wider range of data sources in order to estimate the global disease burden attributable to specific conditions, including diarrhea. The study was conducted to provide some information about the mode of treatment of diarrheal disease in infants below 6 months of age.

Chapter 3

3.1 Materials and Methods

3.1. Research Design

This research study was a descriptive study.

3.1.1. Study population

Characteristics and data collection Sample

The Hospital records of patients aged below six months admitted into Institute of Child Health And Shishu Sasthya Foundation Hospital, Mirpur Dhaka were reviewed for this study.

Inclusion criteria:

- **Patient** : Diarrheal infant patient
- **Age** : Below 6 months
- **Sex** : Both

All the samples data and case histories were collected only with consent from.
The patient's history of loose watery stool or having other illness such as fever, vomiting, cough, etc was recorded.

3.1.3 Patients Data

The patient's personal information, his or her family history and use of antibiotics and history of present illness at admission were recorded.

3.1.4. Patient's Personal Information

Patient's personal information contains the

- Name
- Age in Months
- Sex
- Date of Birth
- Place of Birth
- Address
- Date of admission
- Discharge date
- Breast feeding practice

3.1.5. Symptoms and other clinical information (during admission in hospital)

- Fever
- Cough
- Vomiting
- Loss of appetite
- Feeding pattern
- H/O medication during the present illness
- Previous clinical history of similar episode (last 1 year)

3.1.6. Physical Examination (at admission)

- Passage of loose watery stool
- Vomiting
- Temperature.

3.1.7. Data analysis:

Data were established using SPSS software program. All information were collected from patient's hospitals previous record. Descriptive statistics were done for major variables of infants including age distribution, gender discrimination, symptoms and treatment with different antibiotic.

Chapter 4

RESULTS

4.1. Age distribution of the infants:

Table2: Age distribution of the infants:

Age (months)	0-≤2	>2-≤4	>4-≤6
No. of patients	5	5	8

The result shows that 5 patients are between 0 and 2 months. Another five patients are between of 2 and 4 months. Eight patients are from the age of above 4 months to below six months.

4.2. Number patients treated with or without antibiotic:

Table 3: Number of patients treated with and without antibiotic

Total Number of Patients	Patients received antibiotic	Patients did not receive antibiotic
18	02	16

From the above data the table shows that among 18 patients 2 received antibiotic therapy and 16 did not receive antibiotic therapy.

Demographical data of dirrheal Patient

	name	age	sex	doa	dod
1	Joy	8.00	Male	04/01/09	06/01/09
2	Noyon	11.00	Male	06/01/09	14/01/09
3	Estiag	11.00	Male	09/01/09	14/01/09
4	Amira	.11	Female	11/01/09	14/01/09
5	sanjoy	12.00	Male	03/01/09	05/01/09
6	Esha	7.06	Female	17/01/09	20/01/09
7	Sahadad	3.00	Male	04/01/09	06/01/09
8	Tasfik	11.00	Male	23/01/09	27/01/09
9	Rafi	4.00	Male	10/01/09	14/01/09
10	Thasin	13.00	Male	23/01/09	25/01/09
1'	Antora	51.00	Female	11/01/09	14/01/09
12	Jarif	17.00	Male	04/01/09	06/01/09
13	Ratul	15.00	Male	04/01/09	06/01/09
14	Rupam	6.00	Male	25/01/09	28/01/09
15	Afroja	15.00	Female	23/01/09	26/01/09
16	Habib	2.00	Male	17/01/09	26/01/09
17	Gracia	13.00	Female	25/01/09	26/01/09
18	Eiamin	3.00	Male	20/01/09	26/01/09
19	Fahad	12.00	Male	13/01/09	14/01/09
20	Juthe	15.00	Female	06/01/09	09/01/09
21	Mahtab	7.00	Male	06/01/09	08/01/09
22	Sia	20.00	Female	07/01/09	08/01/09
23	Abir	5.00	Male	03/01/09	08/01/09
24	Anan	132.00	Male	08/01/09	09/01/09
25	Foyez	.21	Male	05/01/09	09/01/09
26	Roni	7.14	Male	05/02/09	07/02/09
27	Fardin	2.12	Male	02/02/09	07/02/09
28	Habibull	.17	Male	30/01/09	07/02/09
29	Rahad	14.00	Male	25/01/09	25/01/09
30	Mumtahin	3.00	Female	24/01/09	25/01/09
31	Tamim	7.00	Male	24/01/09	25/01/09
32	Emad	66.00	Male	03/01/09	06/01/09
33	sadiya	8.00	Female	03/01/09	06/01/09
34	Sahed	18.00	Male	04/01/09	06/01/09
35	Filimon	4.00	Female	05/01/09	07/01/09
36	Ruhama	24.00	Female	05/01/09	07/01/09
37	Ainal	15.00	Male	05/01/09	07/01/09
38	Nirob	26.00	Male	05/01/09	07/01/09
39	Mahin	13.00	Male	05/01/09	07/01/09

	symptoms
1	passage of loose offensive stool ,associated electrolytes e
2	Repeated vomiting for 1 days and loose motion 1time
3	fever for 3 days ,loose motionfor some time
4	fever for 3 days ,loose motionfor some time
5	vomiting for several times for 1 days ,loose watery stool, H
6	vomiting for several times for 1 days and loose stool for 2t
7	Vomiting ,passage of loose watery stool for 2 days
8	Watery loose stool for 4 days
9	Loose stool ,fever for 1 days
10	loose stool since noon,fever for few days ,refuse to take fo
11	Fever for 2 days .passage of loose stool mixed blood for 2 d
12	losse motion for 1 day,vomiting last night
13	passage of watery stool ,associated e-,vomiting for 2 days
14	loose motion 5-6 times/days for 5days,low grade fever for 2
15	Loose stool for 2 days and fever for 1 days
16	Cough and cold for 10-12 days,swelling
17	passage of loose watery stool with associated e- and vomitin
18	Loose watery stool for several times for 10 days and vomitin
19	Loose motion ,vomiting repeated since last day
20	Cough and cold for repiratory disturbs for 2 days
21	passage of loose stool for 4 days,vomiting 3 times since mor
22	Vomiting about 6 times
23	vomitng for several times(yellow color)for 1 day and loose s
24	Fever for 5 days,vomiting for 2 days,loose mucoid stool sinc
25	loose watery stool
26	Passage of loose stool for 2 days,fever for 2 days and vomi
27	Passage of loose stool for 4 days
28	Passage of loose stool for 2 days,vomiting occassionally for
29	Loose stool for 4 days and vomiting for 2 times
30	Passage of watery loose stool and cold
31	Loose stool for 4-5 days,vomiting for several times from las
32	Fever for 4 days,rash allover the body for 3 days,high color
33	vomiting for 1 days and loose stool for 1day
34	Loose motion for 1 day and vomiting same duration
35	Loose motion for 5 days and vomiting same duration
36	Fever for 2days and loose stool for same duration in several
37	Repeated vomiting 10 times from last morning
38	Loose motion for 2 days ,H/o ,polio vaccination befor 2 days
39	Loose watery stool 6 days and fever for 2 days

	treatmen
1	Diet:Rice saline ,Infusion of Injc.koloride 500 ml IV at30m
2	normal diet,Inf.10% Koloride 600 ml IV at 100micro drops/mi
3	normal diet,Inf.10% Koloride 600 ml IV at 100micro drops/mi
4	Breast feeding, Inf.Koloride 100 ml IV at 25 microdrops/min4
5	Npo for 6hr,10% Koloride 600ml iv at 100 micro drops/min
6	Diet NPO6 hr ,Inf 10%Kolosal 550ml ivat 100 microdrops/min,i
7	5%Koloride400iv at 100m.drops/min4hr,inj.5%Koloride500ml i
8	Diet:khechury,Inj.koloride500ml iv at 60m.drops/min 6hr
9	Breastfeed,Inf.Koloride330ml iv at 50d/min, inj.ciprozoid25m
10	Npo Inf.Koloride500ml iv at 60drop/min 6hr
11	Inf.Koloride 1000cc at 100 m.drops/min,inj.ciprozoid60ml iv
12	Npo 4days,Inf.Koloride 800ml iv at 200 m.drops/min
13	Npo3hr,inf.inj.Koloride500ml iv at 300d/min over4hr then 500
14	Breastfeed,Inf.Koloride500ml iv at 90m.drop/min in6hr,inj.c
15	diet:Khechuri,Inj.Koloride500 at 60 m.d/min6hr,Neosaline
16	Diet:rice saline,inf.inj.koloride500ml iv at 100m.drop/min 4
17	Npo6hr,Inf.kolojal 350ml iv at 60m.d/min,ors,diet soyamilk,i
18	Npo 4hr,saline iv40 md/min
19	normal nebulization .5ml veuloiin+.5ml 1 pravent
20	Npo 4hr,Inf.koloride 650 iv at 130 d/min,inj.ciprox 45 ml iv
21	Npo 4hr,Inf.5%koloride 500ml ,ORS 10-15 TSF
22	NPO ,inf.10%koloride 450ml iv at 75 m.d/min,inj.civox 35ml/i
23	NPO ,inf.10%koloride 450ml iv at 75 m.d/min,inj.civox 35ml/i
24	Npo 6hr,Inf.10% liobottsjunior 2500ml iv at 25d/min,inf.Diap
25	Breastfeed,inf.10%koloride 250ml 80 m.d/minthen 175ml iv at
26	Npo 3-4hr,Inf.5%koloride 450ml iv at60m.d/min
27	Diet:Breastfeed,Inf.koloride 300cc at 30m.d/min
28	Diet:Breastfeed,Inf.1/2steanth cholerasaline 70 mliv 70m.d/m
29	Diet:normal,Inf.Dianak 500ml iv at 80 Microdrop/min
30	Diet:Breastfeed,Inj.koloride400iv at 500microdrops/min
31	Npo 4hr,Inf.koloride 600ml at 50 microdrops/min 8hrs
32	Normal diet,Inj.liboh sjr 500 iv at 5-6 Drops/min
33	Npo 4hr,Inj.koloride 600ml iv at 150 m.d/min
34	Diet:khechuri,Inj.koloride700ml iv at 100m.d/min
35	Breastfeed,Inf.5%koloride 500iv at 40 M.d/min,syrup .Otosit
36	Diet:normal,Inf.koloride 500ml iv at 50 md/min,napa supp125
37	Npo-Tfo,Inf.10%babysaline iv at 60m.drop/min
38	Npo 4hr,Inf.koloride 1000cc iv at 50 microdrops/min
39	Npo 4hr.Inf.koloride 600ml iv at 150microdrops/min

	name	age	sex	doa	dod
40	Labib	6.00	Male	04/01/09	07/01/09
41	Reta	5.00	Female	07/01/09	09/01/09
42	Runa	1.00	Female	07/01/09	09/01/09
43	Siam	15.00	Male	05/01/09	10/01/09
44	Nisat	5.07	Female	08/01/09	09/01/09
45	Jarif	8.14	Male	12/01/09	16/01/09
46	Alif	10.14	Male	09/01/09	12/01/09
47	Tusar	2.26	Male	02/01/09	05/01/09
48	Sayed	51.00	Male	13/01/09	16/01/09
49	Nahian	13.00	Male	15/01/09	16/01/09
50	Pranto	5.25	Male	14/01/09	14/01/09

	symptoms
40	passage of loose watery stool for 2 days
41	Loose motion for 3 days and vomiting for same duration
42	Frequent loose watery stool 1-2 days and vomiting
43	Frequent loose motion (watery)for 1 days and vomiting for 2
44	Loose motion for 2 days ,vomiting since morning
45	Fever for 2 days ,vomiting for same duration and loose stool
46	loose motion and vomiting for 3 days
47	Loose stool and vomiting for 2days
48	repeated vomiting 2 days
49	Loose watery stool for 1 days vomiting several times for 1 d
50	Loose watery stool 1 day

	treatmen
40	Npo 4hr,Inf.5%koloride650ml iv at 100microdrops/min
41	Npo 6hr,Inf.koloride 500ml iv at 60microdrop/min 8hrs
42	1/2 srength cholera saline 150ml iv 20micro drop/min,inj.Am
43	breastfeed,khechuri,kachakola ,Injkoloride 720ml at 100micro
44	Npo 4 hr,inf.koloride 500ml iv at 120 micro drops/min
45	Npo 4hr,inf.koloride 500ml iv at 125 microdrops/min for 4hrs
46	Npo 6 hr ,inf.koloride 200 ml iv at 190 micro d/min then 96
47	Npo TFU,Inf.koloride 500ml iv
48	Npo 4 hr,inj .10%baby saline 300 ml iv at 33 md/min then 700
49	diet:normal,Inj.10%koloride 800ml 30md/min,syrup otosit 1TS
50	Breastfeed,inf.koloride 40ml at 96 micro drop/min 4hr ,syrup

Figure 5: Percent distribution of male and female patients.

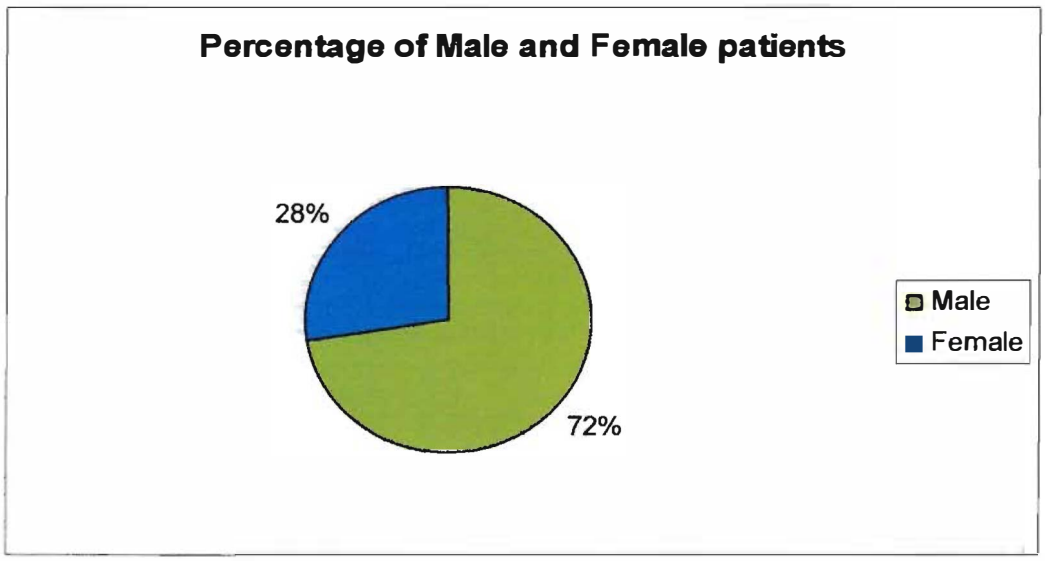


Fig 5: % Distribution of male and female (n=18 diarrheal patients)

Figure 6: Treatment of patients (%) with or without antibiotic (n=18)

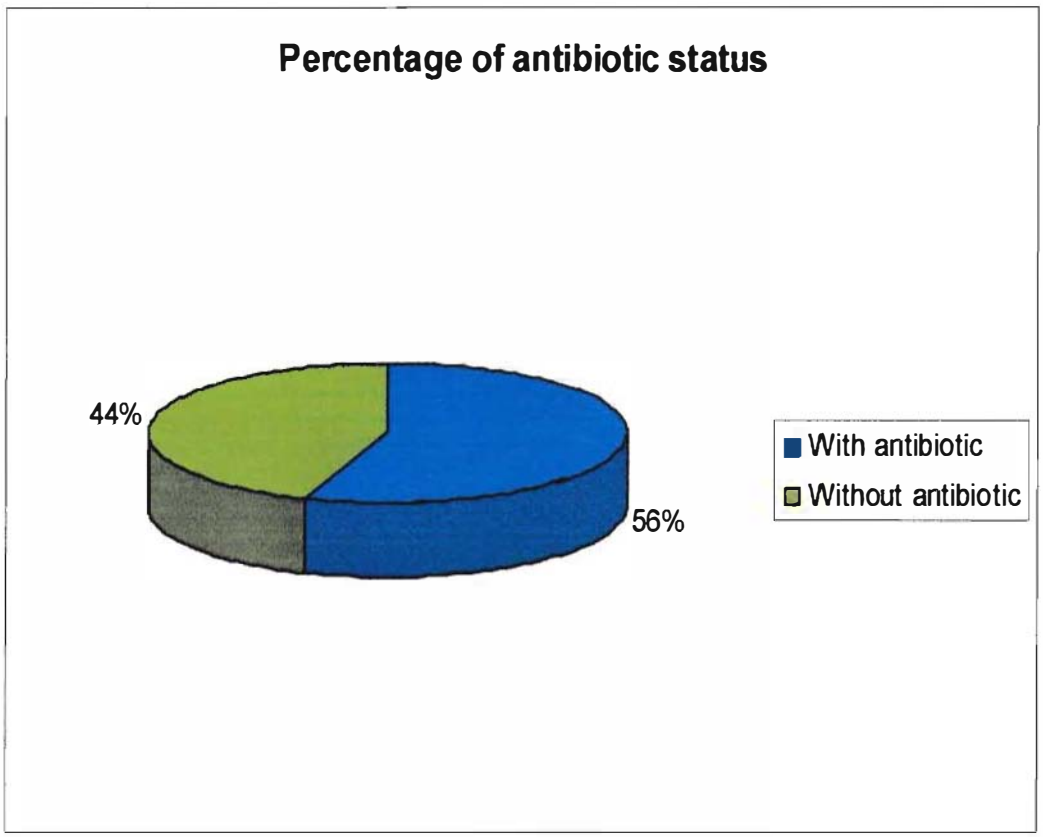


Fig 6: % Distribution of 18 patients's treated with or without antibiotic

Table:-4 Number of diarrheal patients with different signs and symptoms

No. Patient	Symptoms With Diarrhea
6	Loose motion
7	Loose motion + Vomiting
2	Vomiting
1	Fever
1	Vomiting + Fever
1	Cough & Cold

Table: - Number of diarrheal patients with different signs and symptoms

Table-:4 Shows total number of diarrheal patients associated with vomiting, fever, cough and common cold. Most of the diarrheal patients were associated with vomiting and loose motion.

Chapter 5

Discussion and Conclusion

The result of the present study has clearly shown that the symptoms of 18 infants treated with or without antibiotic therapy disappeared after the treatment. Infants of below six months should not be directly treated under antibiotic at initial stage if there are any serious complications found.

A community based study conducted by Alam out in Chittagong metropolitan area of Bangladesh,, has shown that there is a significance misuse of antidiarrheal drugs among under-five children (Alam MB, 1998).

It has been shown from other studies that mothers with a higher level of education were more likely to adopt messages on diarrhea management. Caregivers who were in contact with health services were more likely to use rehydration therapy than those who were not. The mean percentage of children with diarrhea who were taken to an appropriate health-care provider and received an oral rehydration solution ranged from 54% to 75%, compared with a range of 20% to 33% among children not taken to a health-care provider.

In summary, our findings point to an unfinished agenda in diarrheal case management of infants in our locality of Dhaka as well nationwide to concern people. Today, more than 200 million children globally may not be receiving ORT when they suffer from diarrhea. This is a cause of great concern. It calls for serious analysis of the reasons for a situation that is disappointing, given the significant efforts made over the past 25 years to promote proper home-based case management of diarrhea in children. Adequate management of childhood diarrhea is essential to reach the Millennium Development Goal of a reduction in mortality rates of children aged less than 5 years by two-thirds between 1990 and 2015.

Acute diarrhea diseases rank second amongst all infectious diseases as a killer in children below 5 years of age worldwide. Globally, 1.3 billion episodes occur annually, with an average of 2-3 episodes per child per year. The important aetiologic agents of diarrhea and the guidelines for management are discussed. Management of acute diarrhea is entirely based on clinical presentation of the cases. It includes assessment of the degree of dehydration clinically, rehydration therapy, feeding during diarrhea, use of antibiotic(s) in selected cases, micronutrient supplementation and use of probiotics. Assessment of the degree of dehydration should be done following the WHO guidelines. Dehydration can be managed with oral rehydration salt (ORS) solution or intravenous fluids. . Antibiotic therapy is not recommended for the treatment of diarrhea routinely. Only cases of severe cholera and bloody diarrhea (presumably shigellosis) should be treated with a suitable antibiotic (Sur D, Bhattacharya SK. , 2006).

Out data shows that among 18 of the infants only 2 were treated with antibiotic therapy in ICH & SSF which is a tertiary based Hospital. These two infants had severe symptoms of diarrhea. All the infants recovered after getting proper treatment in this hospital.

Globally diarrheal diseases account for almost a fifth of all deaths of children under 5 years, with an estimated 2.2 million deaths annually. Diarrhea is still a common disease both in the developed world and developing world. Research is ongoing to identify the most sensitive and specific tools to identify the causative organism so that the antibiotic treatment and other directed treatment can be used more precisely.

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