



MANAGEMENT OF ACUTE DIARRHOEA

**An update for the
General Medical
Practitioner.**

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GOVT. OF MAHARASHTRA, PUNE.**



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OF
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DIARRHOEA**

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1. INTRODUCTION

Diarrhoea is an important paediatric problem in our country.

One third of the paediatric admissions in hospitals are diarrhoea related.

About 80% deaths due to diarrhoea occur in the first 2 years of life. The main cause of death in acute diarrhoea is dehydration which results from loss of fluid and electrolytes in diarrhoeal stools. Other important causes of child deaths are dysentery, malnutrition and serious infections such as pneumonia.

Diarrhoea is an important cause of malnutrition. This is because patients with diarrhoea eat less and their ability to absorb nutrients is reduced; moreover their nutrient requirements are increased as a result of infection.

2. WHAT IS DIARRHOEA:

Diarrhoea is passage of loose, watery stools, usually more than 3 times a day.

However, recent change in consistency is more important than the number of stools.

2.1 CLINICAL TYPES:

Diarrhoea is classified by clinical syndromes as

- ◆ Acute watery diarrhoea.
- ◆ Dysentery.
- ◆ Persistent diarrhoea.

In clinical practice more than three fourth cases seen are of acute watery diarrhoea.

2.2 CHARACTERISTICS OF EACH TYPE :

2.2.1 Acute Watery Diarrhoea :

- ◆ Starts suddenly and is characterized by loose watery motions.
- ◆ Most episodes recover within 3-7 days.

2.2.2 Dysentery :

- ◆ Diarrhoea with visible blood in stools.
- ◆ This may be accompanied with abdominal cramps, fever, anorexia and rapid weight loss.
- ◆ Shigella is the most common cause of dysentery in children.
- ◆ Entamoeba histolytica is a very rare cause (01-2%)

2.2.3 Persistent Diarrhoea :

Any diarrhoea is called as persistent diarrhoea when an acute episode lasts for more than 14 days.

These episodes are generally associated with growth failure, inadequate weight gain or loss of weight. These cases require careful management.

2.2.4 Cholera;

Cholera is an acute form of diarrhoea. More than 90% of sporadic cases of cholera are difficult to distinguish from other causes. This is important because if treatment is delayed or is inadequate, death may occur quickly due to dehydration.

Cholera should be suspected when -

- ◆ An adult develops severe dehydration from sudden watery diarrhoea.
- ◆ Any patient having acute watery diarrhoea in an area where there is an outbreak of cholera.

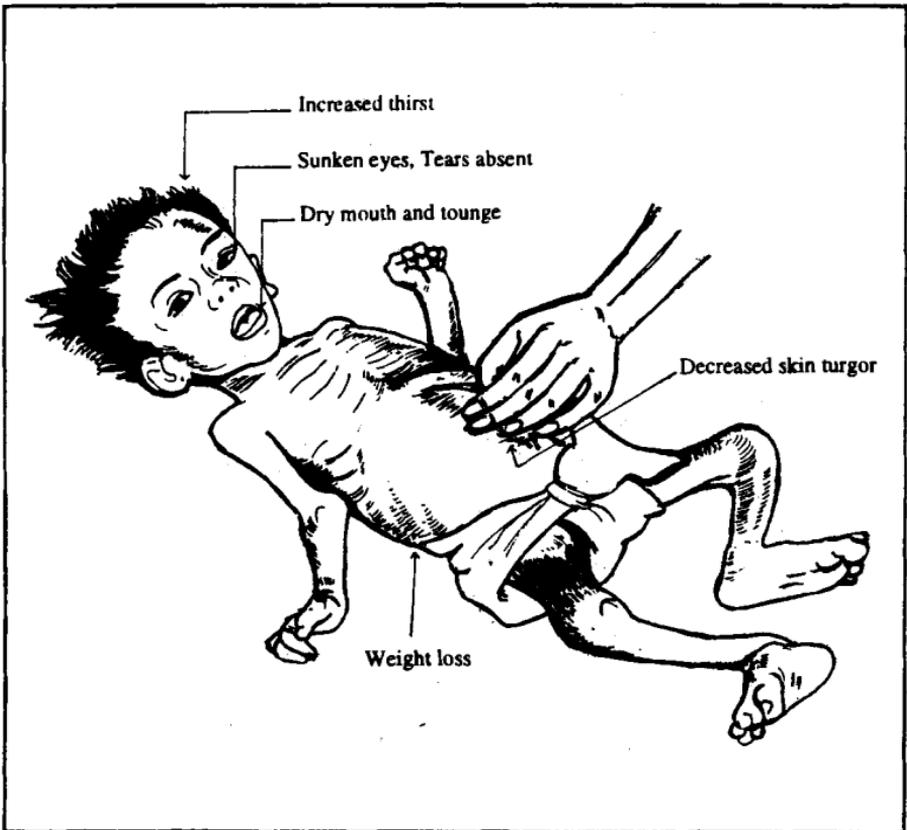
2.3 CONSEQUENCES OF DIARRHOEA :

There are two serious consequences of diarrhoea.

- ◆ Dehydration.
- ◆ Malnutrition.

While dehydration can lead to death very quickly unless adequately treated, malnutrition has a long term impact on health status of child.

3. CLINICAL ASSESSMENT:



The clinical assessment of a child with diarrhoea is done to determine

- ◆ The type of diarrhoea.
- ◆ degree of dehydration.
- ◆ associated problems if any.

The Age, weight and nutritional status of child should also be noted.

- ◆ Ask for frequency and duration of diarrhoea.
- ◆ Classify the type of diarrhoea
 - * Acute watery
 - * Dysentery
 - * Persistent diarrhoea
 - * Cholera.

Then examine for signs of dehydration. Symptoms and signs of dehydration start appearing when fluid loss is equivalent to more than about 5% of body weight.

These are :-

- ◆ Increased thirst *
- ◆ Restlessness, irritability *
- ◆ Decreased skin turgor *
- ◆ Dry mouth and tongue
- ◆ Tears absent
- ◆ Sunken eyes.

The patient is diagnosed as having dehydration when two or more of the above mentioned signs are present including at least one marked (*)

- ◆ Check for increased thirst by offering water to the child.
- ◆ Skin turgor is best elicited on abdominal skin. Keep pinch for three seconds and release; normal skin

goes back quickly. For patients with dehydration the skin goes back slowly i.e. takes more than 2 seconds.

- ◆ Tears can be seen when a child cries at the time of examination.
- ◆ Blood pressure may also be recorded where facilities are available.

When fluid deficit reaches 10% of the body weight severe dehydration sets in. A child with severe dehydration is usually.

- ◆ Lethargic or unconscious, floppy .
- ◆ Unable to drink.

4. MANAGEMENT OF DIARRHOEA :

Routine determination of the etiology of diarrhoea in a laboratory is not practical. Management of diarrhoea therefore depends upon the type of diarrhoea. Most diarrhoeas are self limiting and stop in a few days. No drug other than ORS is required.

4.1 ACUTE DIARRHOEA : The treatment of patients with acute diarrhoea must therefore be based on major features of the disease and an understanding of the underlying pathogenic mechanisms. The main principles of treatment are-

Fluid replacement :- Diarrhoea requires replacement of fluids and electrolytes, irrespective of its etiology. This is the most important and life saving aspect of management of cases of diarrhoea.

Feeding :- Feeding should be continued during all types of diarrhoea to the greatest extent possible, to prevent malnutrition.

Antimicrobials and antiparasitic :- These should only be given when cholera is suspected.

4.1.1 Fluid replacement:- Fluid and electrolyte replacement is necessary for all types of diarrhoea and is the mainstay of therapy.

4.1.1.1 Purpose of fluid therapy

◆ For patients having diarrhoea without signs of dehydration, the purpose of fluid therapy is -

Prevention of dehydration by replacement of ongoing losses. and,

Provision of normal fluid requirement.

◆ For patients with signs of dehydration, the urgent requirement is-

Correction of deficit as early as possible.

Replacement of ongoing losses.

Provision of normal fluid requirement.

ORS is the best available solution for fluid and electrolyte replacement. In early stages of diarrhoea or when ORS packets are immediately not available Home Available Fluids (HAF) can be used.

4.1.2 Home Treatment :-

Home treatment is an essential part of correct management of acute diarrhoea. This is because diarrhoea begins at home and a child seen at your clinic will usually continue to have diarrhoea after returning home.

For this the three basic rules of home therapy should be taught to the mother before she leaves your clinic

- ◆ Give the child more fluid than usual.
- ◆ Give the child nutritious food to prevent malnutrition.
- ◆ Bring the child to the clinic if diarrhoea does not get better or signs of dehydration e.g. increase in stools, continued vomiting or marked thirst, or any other serious illness develops.

Fluids which can be used safely include rice water, dal, lassi, and nimbu sharbat. Prescribe or give 1-2 packets of ORS to the mother and advise on how to reconstitute and give ORS solution. This will prevent appearance of signs of dehydration.

4.1.3 Treatment of cases with signs of dehydration:

In cases of dehydration the deficit of water is between 50 to 100ml/kg body wt. If the patient's weight is known then the amount of **ORS** required in 4 hours is 100ml/kg. body wt. If weight is not known then estimated deficit can be calculated using age, although this approach is less precise.

The following table shows age-wise approximate amount of **ORS** required to be given in the first 4 hours.

Age		ORS
0-6 mths	-	1/4 lit.
6mths - 1 yr	-	1/2 lit
1-2 yr	-	3/4 lit.
2-5 yr	-	1 lit.
5-14 yr	-	1-2 lit.
15+ yr	-	2-4 lit.

This table shows the minimum amount of ORS solution required, However in case the patient can drink more than the recommended ORS Solution, all the better.

In case of small children, encourage the mother to continue breast feeding. Show the mother how to prepare ORS, and how to give it. Advise the mother that if a child vomits, wait for 10 minutes, then continue giving ORS, more slowly.

After 4 hours, carefully reassess the patient for signs of dehydration. If the patient has no signs of dehydration, then rehydration is completed. If signs of dehydration are present then continue rehydration therapy with the same dose and reassess after 4 hours.

If the signs have worsened i.e. signs of severe dehydration appear, then the patient should be started on I.V. therapy. The I.V. fluid of choice is Ringer's lactate.

Availability of ORS : ORS is available with all primary health centres, subcentres and depot holders at village level. For use of private practitioners, the WHO formula of ORS is available at medical stores and at fair price shops through the public distribution system.

Use of marketed ORS packets : Some popular brand ORS packets manufactured by private pharmaceuticals are available in the market.

ORS with a WHO/ UNICEF recommended formula is the best treatment for dehydration. This is because it has an electrolyte concentration almost similar to the stools of watery diarrhoeas. We can advise any marketed ORS packet for treatment of dehydration as long as it contains the recommended electrolyte concentration.

The price of these packets is usually high. An adult will require about 4 packets in 4 hours. Due to this a poor patient will either not purchase sufficient ORS or will use it in a dilute form.

If the patient can not afford commercial ORS packets then he/she can be referred to the nearby Primary Health Centre.

4.1.4 Treatment of severe dehydration : A patient with signs of severe dehydration can die quickly from hypovolaemic shock with rapid weak or absent radial pulse, cool & moist extremities. In such cases the patient is lethargic or unconscious. Treatment must therefore start immediately with correct and adequate I.V. fluids.

After diagnosis--

- ◆ decide how much Ringer's lactate is to be given
- ◆ If cholera is suspected, start with antimicrobials.

4.1.4.1 Selection of an appropriate intravenous fluid

A variety of different I.V. solutions are available in the market. However, many of them do not contain appropriate amounts of electrolytes required to correct the deficits caused by diarrhoea. Ringer's Lactate solution is the best commonly available solution. Your chemist can be requested to keep this I.V. solution available all times.

Normal saline should be used only if Ringer's lactate is not available. In this case sodium bicarbonate should be used along with Normal saline in appropriate doses.

In any case, Dextrose 5% should never be used for rehydration of patient.

4.1.4.2 Dose of I.V. fluid :

It is very important to rapidly give adequate Ringer's Lactate for survival of the patient. Weigh the patient so that fluid requirement can be determined accurately. The fluid deficit in severe dehydration equals 10% of the body weight; hence the dose recommended is 100ml/kg body weight.

After assessment of the patient, 5/10ml per kg body weight I.V. If the patient can drink, give ORS by mouth while the drip is set up. Give 100 ml/kg body wt. Ringer's lactate solution as per followings schedule :

Age	First give 30ml/kg.	Then give 70ml/kg.	Total 100ml/kg.
Infant	First 1 hr.	Next 5 hrs.	6 hrs.
Other than Infant.	First 30 mins.	Next $2\frac{1}{2}$ hrs.	3 hrs.

Note

- During IV therapy, the child must be reassessed every 1-2 hours. If hydration is not improving, give IV infusion more rapidly.
- If the child can drink, administration of ORS solution must also be started along with the IV Infusion.
- The child must be evaluated after completion of therapy (100 ml/kg body weight). If signs of severe dehydration have disappeared, continue treatment with oral therapy. If signs of severe dehydration persist, IV fluid therapy must be continued.
- If it is not possible to start the IV infusion for some reason, the child can be given ORS solution through a naso-gastric tube.

After 3 hours (in case of infants after 6 hours) evaluate the patient and switch on to ORS if signs of severe dehydration have disappeared.

SOME EXAMPLES :

- 1) For a child of 7 kg weight with signs of severe dehydration.

Total R L required $100\text{ml} \times 7(\text{kg}) = 700\text{ml}$
(1 1/2 Bottles)

For First hr. $30\text{ml/kg} = 210 \text{ ml}$ (Approx 1/2 Bottle)

For next 5 hrs. 490ml (Approx 1 Bottle)

- 2) For child of 6 yrs weighing 22 kg. with severe dehydration.

Total R.L. required $100\text{ml} \times 22\text{kg} = 2200\text{ml}$

($4\frac{1}{2}$ Bottles)

First 30 min.- 30ml/kg = 660ml (1 1/4 Bottles)

Next 2 1/2 hrs. 70ml/kg = 1540ml (3 Bottles)

- 3) An adult weighing 60 kg with signs of severe dehydration.

Total requirement 100ml into 60(kg) = 6000ml

(12 Bottles)

First 30 min — 30 ml/kg — 1800 ml. (3 Bottles)
approx.

Next 2 $\frac{1}{2}$ hr. — 70 ml/kg. — 4200 ml. (8 Bottles)
approx.

Therefore an adult patient with severe dehydration requires to be infused one bottle every 8 minutes. The above mentioned examples are given mainly to understand how rapidly the infusion must be given . This is crucial for survival of the patient.

4.2 DYSENTERY & ITS MANagements

Dysentery is defined as diarrhoea with visible blood in stools. Other symptoms of dysentery include abdominal pain, tenesmus, etc.

The most common cause of dysentery is shigella. Other causes include Compylobacter jejuni, Salmonella and Escherichia Coli. Entamoeba histolytica causes dysentery in children over 5 yrs of age.

As shigella is the most common cause of dysentery, children with dysentery should be presumed to have shigellosis and treated accordingly. Besides fluid therapy and continued feeding the recommended antimicrobial is cotrimoxazole.

The recommended schedule is shown below :

Child with blood in stools

Treat with Co-trimoxazole for 2 days

If no blood in stools after 2 days

If Blood still present in stool after 2 days

Continue with co-trimoxazole for 3 days more (Total 5 days)

Change antimicrobial give Tab. Nalidixic Acid for 5 days.

4.3 : PERSISTENT DIARRHOEA

Persistent diarrhoea is a diarrhoeal episode that lasts for more than 14 days. About 10% of acute diarrhoeal episodes become persistent. It causes 35% of diarrhoea associated deaths. The important causes of persistent diarrhoea are shigella, salmonella and Enteroinvasive E-coli.

Persistent diarrhoea is largely a nutritional disease. A single episode can cause dramatic weight loss leading rapidly to malnutrition. The treatment of persistent diarrhoea is similar to acute watery diarrhoea or dysentery as the case may be. However correction of any existing malnutrition is essential.

DRUGS NOT TO BE USED IN DIARRHOEA.

- ◆ Adsorbents like pectin, kaolin
- ◆ Antimotility drugs like Diphenoxylate and loperamide
- ◆ Hydroxy quinolines
- ◆ Antiemetics like metochlpropamide (Perinorm)
- Streoids.

ADSORBENTS : These have no effect on cholera, loss of weight and stool volume. Adsorbant give a false sense of security and decrease the possibility of adequate rehydration due to a sence of complacency.

ANTIMOTILITY DRUGS : These are synthetic opiates. These drugs may give some symptomatic relief in adults but are contraindicated due to respiratory depression and altered consciousness. In dysentery, antimotility drugs actually increase the severity of the illness because of delay in clearance of invasive organisms from the colon.

ANTIEMITICS : Metoclopropamide (Perinorm) is widely used as an antiemetic and antispasmodic. Vomiting in dehydration is usually due to acidosis. Unless acidosis is corrected, vomiting will not stop. There is no role of antiemetics in such vomitings. As these drugs also have some sedative action, signs of severe dehydration may be missed.

STEROIDS : Shock in dehydrated patients is due to excessive depletion of fluid and electrolytes. Immediate and large amount of I.V. fluids is the primary need of patients. Steroids have no role in this therapy.

5. PREVENTION OF DIARRHOEA : Health education regarding diarrhoea transmission and its prevention results in a long term positive impact. Some important messages to be communicated are

- 1) Use chlorinated water for drinking.
- 2) Wash hands after defecation, before preparation of food, and before eating.
- 3) Exclusive breast feeding for first 4-6 months.
- 4) Avoid using infant feeding bottles.
- 5) Safe disposal of faeces including those of infants.

Measles immunisation and a dose of Vit - A on completion of 9 months of age, reduce the risk of serious diarrhoea.

**ANTIMICROBIAL USED IN THE TREATMENT OF
SPECIFIC CAUSES OF ACUTE DIARRHOEA
IN CHILDREN**

Causes	Drug(s) of choice	Alternative
Cholera	<p style="text-align: center;">Doxycycline 6 mg/kg/day in a single dose x 3 days OR Tetracycline 50 mg/kg/day in 4 doses daily x 3 days</p>	<p style="text-align: center;">Erythromycin 30 mg/kg/day in 3 doses x 3 days</p>
Shigella dysentery	<p style="text-align: center;">Paediatric Cotrimoxazole 1 tablet twice a day x 5 days (under 2 months)</p> <p style="text-align: center;">2 tablets twice a day x 5 days (2 - 12 months)</p> <p style="text-align: center;">3 tablets twice a day x 5 days (1 - 5 years of age)</p>	<p style="text-align: center;">Nalidixic Acid 55 mg/kg/day in 4 doses x 5 days</p>
Acute intestinal amoebiasis	<p style="text-align: center;">Metronidazole* 30 mg/kg/day in 3 divided doses x 5 days</p>	
Acute giardiasis	<p style="text-align: center;">Metronidazole* 15 mg/kg/day in 3 divided doses x 5 days</p>	

- Tinidazole can also be used in recommended doses.