
Pediatrics

Diarrhoea and its Modern Treatment

By

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This article is the result of long and varied experience gained in the children's Medical Ward in the Irwin Hospital, Delhi. It deals with etiology, management and preventive aspects of diarrhoea in children.

Diarrhoea is the term used for describing the condition present when an excessive number of stools are passed and there is alteration of character of stools from semi-solid to loose watery consistency.

Diarrhoeas make a large contribution to sickness and mortality especially in infancy. It is more frequent and more serious in hot weather. It occurs about four times more frequently in artificial fed babies than in breast fed babies.

Etiology.

1. Dietetic Group : This is of paramount importance especially in infants and younger children. The fault may be due to :

- (a) Too frequent feeding.
- (b) Irregular feeding.
- (c) Over-feeding.
- (d) Defective formula of artificial milk feeds.
- (e) Too early starting of food of high caloric value by eager mothers.
- (f) Hunger diarrhoea due to under-feeding.

Characteristics of Stools :

- (a) Consistency of stools varies from watery to semi-solid ; small curds being present due

to incomplete digestion of proteins.

- (b) The number of stools is smaller, usually less than ten. There is no blood and mucous along with stools.
- (c) Colour has hardly any diagnostic significance except that white stools indicate deficiency of stercobilinogen and green stools indicate a definite 'hurrying up' of foods in the upper digestive tract.

2. Infective Group : Exogenous type of infection is due to specific organisms or viral type of infection. The commonest organisms in infective group as indicated in the reports of stool examination are :

- (a) *Bacillus dysentery* organisms of Shiga and Flexner type.
- (b) *Staphylococcus*.
- (c) *B. coli* and others may also be responsible at times.

In the Infective Group the child looks more ill and toxic than in the Dietetic Group, and complications are more frequent in the former.

Characteristics of Stools :

- (a) Consistency varies from case to case. Cases in which there is an explosive onset, and the number of stools is large, may be infective in origin though demonstration of cellular exudate is rare.
- (b) The number of stools is usually more than ten ; the average being fifteen to twenty. Blood,

mucous or both are present. Stool culture may afford valuable diagnostic help.

3. Parenteral Group or Endogenous :

This is diarrhoea in response to any infection in the body e.g., otitis media, acute tonsillitis, pneumonia, pyelitis, etc. The diarrhoea in this case is due to secondary disturbances in the intestinal tract. This may be due to :

- (a) Some organisms which are responsible for systemic infection.
- (b) Toxins elaborated by the organisms.
- (c) Infective processes lower the resistance of the gut and even the normal bacteria flora becomes pathogenic or, may act as superadded infection. In this case *friends become foes*.
- (d) There is reflex irritability.

Characteristics of Stools :

- (a) Consistency varies from case to case.
- (b) The number of stools is small.
- (c) There is no cellular exudate.

Diarrhoea is not controlled until the cause is treated, i.e., until the foci of infection is attacked with great skill and care.

4. Miscellaneous Group :

- (a) Toxic as in food poisoning, uræmia, etc.
- (b) Mal-absorption of food, as in T.B. infected intestines, etc.
- (c) Allergic due to some allergin such as foreign proteins.
- (d) Metabolic as in thyrotoxicosis.
- (e) Nervousness or psychological element, such as before undergoing any examination or due to fear in younger children, or for want of love and attention especially when mother is absent.

GENERAL MANAGEMENT

First investigate the cause and then direct the treatment towards its

removal. In the mean time as the patient is losing a good deal of fluid, he should be kept at rest, preferably in bed and should be kept warm and comfortable. The patient's mouth should be kept clean and his lips and tongue as moist as possible. Any pain which accompanies the passing of stool should be relieved by applying light warmth over abdomen. The skin around anal region should be protected from getting sore by application of slightly greasy preparations. (Carron-oil which is mixture of linseed oil and lime water is excellent for this purpose, and the skin might be cleaned with this instead of soap and water). Very keen observation and gentleness in nursing care of infants is needed.

Dangers.

The main dangers from diarrhoea are :

- (i) Dehydration.
- (ii) Disturbed electrolyte balance.
- (iii) Metabolic disturbances.
- (iv) Chronic malnutrition.
- (v) Intercurrent infection. This may occur as the vitality of the individual is lowered.

Factors which determine the prognosis.

1. Frequency and character of stool determine the severity.
2. Recovery is quicker in a well nourished child.
3. Manner of feeding.
4. Age of child.

Treatment.

The following principles of treatment need be emphasized :—

- (1) Fluid Administration.
- (2) Correction of electrolytic imbalance.
- (3) Starvation or rest.
- (4) Treatment of infection.
- (5) Dietetic regime.
- (6) Sedatives.

N.B. All treatment must be carried out according to the physician's instructions.

(1) *Fluids Administration.* Acute diarrhoea is the first emergency. Fluids are life saving. Fluids should be adequate in quantity and quality (i.e., containing proper electrolytes.) They may be administered as under:—

In mild case—75 c.c. per lb. of body weight	} In twenty- four hours
In moderate :—100 c.c. per lb. of body weight	
In severe :—125 c.c. per lb. of body weight	

This is usually given in divided doses.

Route.

I. Intravenous route is the best, especially in acute dehydration.

II. Subcutaneous route is considered as the second best.

Sometimes it is difficult for doctors to find to a good vein (as they are in a collapsed state) so subcutaneous infusion is given. The nurses generally give subcutaneous infusions. (Refer for procedure to a nursing text book). The abdominal walls and anterior or lateral aspects of thighs are desired sites commonly selected in this Ward's routine. One ampoule of hyaluronidase 3 mgs. is added to every 300 c.c. of half normal saline to facilitate rapid absorption and distribution of fluids in the body.

Types of Fluids.

(a) *For Intravenous use :* 5% glucose or Dextrose—Saline solution is the recommended solution.

(b) *Plasma Expander :* Periston, Plasmosan, Polyvinyl Pyrallidon, and Destran.

(c) *For Subcutaneous use :* We use half strength normal saline.

Full strength normal saline is avoided for the following reasons:—

- (i) It may act as a local irritant ;
- (ii) It may cause hypernatremia (excess of sodium) ;

(iii) Half strength normal saline facilitates rapid absorption as the greater osmotic pressure in the capillaries tends to draw water in the blood.

(iv) If kidney functions are deranged, it is well to restrict sodium which otherwise is likely to be retained in the body. One-sixth molar solution (of sodium lactate) is used in cases of acidosis.

(v) Sometimes sodium bicarbonate solution is used. (In the cases of (iv) and (v), their use requires a good bio-chemical laboratory facilities).

It must be remembered, while lack of fluids mean insufficient treatment, an excess may get logged up in the tissues. There may also result an oedema of the lungs. The nurse has to watch for symptoms of congestion of lungs such as dysnoea, cyanosis, and frothing from mouth.

(d) The patient is encouraged to take fluids by mouth every one to two hours. One-third strength normal saline or five per cent dextrose plus equal amount of normal saline are good solutions.

(2) *Correction of Electrolytic Imbalance :* Potassium, Calcium, Phosphorous are minerals which are lost in diarrhoea. Of these, potassium is of the utmost importance. The common salts lost are sodium and the chlorides. Fluids are lost first from plasma then extra cellular fluid is lost and later come intra-cellular fluid. When extra-cellular fluid is lost then plasma draws fluids from intra-cellular fluids. Thus potassium, calcium, magnesium is lost. Symptoms of loss of potassium are not so definite. The loss of potassium is made up by Darrows Solution which contains proper proportions of sodium chloride and potassium.

The nurse has to watch for signs of hypopotassiamia—

- (1) Drowsiness and lethargy,
- (2) Distention of abdomen,

(3) Dyspnoea

Potassium is given in doses of half one drachm every 3 to 4 hours. One important point which the nurse has to make sure about is diuresis. If the patient is having marked oliguria or anuria, the doctor is to be informed and potassium is withheld.

Calcium deficiency is manifested in the syndrome known as tetany. If the nurse observes any symptoms of tetany, she should inform the doctor immediately. The doctor may order intravenous Calcium Gluconate 3-20 c.c. depending upon the age. Intravenous calcium produces immediate effects.

(3) Starvation or Rest. Rest to the gut is very important for recovery. So initial starvation is specially helpful in acute diarrhoea for about 12 to 48 hours. It provides rest to the bowel and lessens putrefaction and fermentation processes in the alimentary gut, but even during starvation, one third strength normal saline by mouth is allowed every two hours or so.

(4) Treatment of Infection. If there is no evidence of infection, no specific drugs are needed. Kaoline, which was used in the past for binding the stools and for its sedative action on the gut, should not be given (according to modern concept). It absorbs such electrolytes as potassium and calcium and promotes electrolyte imbalance more readily.

Opium :

We find that some of the mothers give opium to their children at home. This should be avoided especially in children below one year, because of the real danger of opium poisoning.

Antibiotics :

In the presence of infection the routine treatment carried out here is : Sulpha drugs give fairly good results. Sulphadiazine is considered to be the best. The dosages may be—

Under one year	— two tablets in 24 hours
one to 1½ years	— three tablets in 24 hours
three to 6 years	— four tablets in 24 hours

six to 12 years — six tablets in 24 hours.

The urine output should also be measured if possible. Hardly any complication is noticeable. In resistant cases and when infection is present, doctors generally order :

- (a) Streptomycin by mouth 20 mgs. per lb. in 24 hrs.
- (b) Terramycin 20-25 mgs./k. gm. by mouth in 24 hrs.
- (c) Achromycin 12½ to 20 mgs./per k. gm. in 24 hrs.

Any of the above drugs may be tried.

(5) Dietetic Regime. After initial starvation, as the stools become less frequent and well formed, feeding should be started.

(1) If the child is breast fed, it is best to continue it every three to four hours. Feeds should be made less frequent or the interval between feeds prolonged in cases of persistent diarrhoea, distention or vomiting.

(2) If artificially fed : Start half-strength skimmed milk every 3 to 4 hours and go on increasing to two-third strength, three-fourth strength and then to full strength. After a few days start on cow's milk two to one, and then to full strength according to age. Wait for the result before a different formula is started.

(3) Protein milk is useful when there are a large number of watery stools. It binds the stool.

(4) According to the age of the child, start making such additions to his food as *suji*, mashed vegetables, banana, arrowroot *conjee*, but one at a time.

(5) Ripe banana and apple, raw or stewed are good during state of diarrhoea. Fruit juice should be avoided.

(6) In older children rice, curd and banana are good.

(6) **Sedative.** When there is marked restlessness, phenobarbitone is helpful. One to three grains in 24 hours is generally ordered by physicians, depending upon the condition of the patient, toleration and age. Infants and children

tolerate this drug well. The sedation produces generalized sedative effect and diarrhoea also may be lessened. To avoid local reddening and irritation of anus, zinc oxide ointment or caron or castor oil should be used. To clean the area around anus, oil alone should be used.

III. Prevention of Diarrhoea : A few important points are given below —

(a) Breast feeding when possible should always be encouraged because it is food with all the normal requirements and the minimum danger of infection. Breast fed babies are less prone to diarrhoea. The mother is instructed about her personal hygiene including that of the breast; emphasise this among the labour class and illiterate women.

(b) In artificial feeding, proper cleanliness of milk bottle, teat and vessels concerned is very essential. Milk formula should be properly prepared and the milk prepared fresh each time, if no storage facilities are available.

(c) Supplementary foods should be added very gradually and results awaited. If assimilation is good, the second supplement is to be started gradually so that the child's alimentary tract gets used to changes of food.

(d) Auto-infection in bigger children should be avoided by training them to wash their hands properly and to keep their nails short and clean.

(e) All foods should be protected from external contamination. Children should be encouraged to have home made sweets instead of buying from hawkers and shops which are often unhygienic.

(f) Feeds of toddlers : (one to three years of age) should be well regulated. At this age if they are not trained in proper eating habits, they sit down with every member of the family, and this too frequent or irregular feeding often results in diarrhoea.

(g) Mothers staying in the Children's Medical Ward, Irwin Hospital are given 'health talks' about cleanliness. They are instructed to wash their hands in some antiseptic lotion e.g. Dettol 3%, before handling anything for the child. This has considerably helped in controlling the infection in this Ward.

(h) All infections should be adequately treated. All children should be medically inspected if there is suspicion of any foci of infection.

(i) In bad cases of diarrhoea, isolation is necessary. In this hospital there is an altogether separate Gastro-enteritis Ward with special nurses, and separate hand washing facilities for mothers.

Health teaching is imparted to every mother whenever anything new for the individual child is done.

(j) Before the mothers leave the Ward, i.e., when child is on the way to recovery, the mothers are encouraged to participate in group talks and discussions. The feeding problems of children are discussed in detail. Regular and proper habit forming rules and regulations are explained by which they can train their children in good habits. Thus a mutual link of friendship is established, so that they come to seek advice from the doctors and nurses when they are faced with a problem in the proper maintenance of their children's health.

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