

DIARRHEA

LEARNING OBJECTIVES:

- Etiology and diagnosis of diarrhea
- Clinical management of diarrhea
- Preparation and administration of O.R.S
- Health education and preventive measures

TEACHING STRATEGIES:

- Group discussions and role-plays to reinforce certain skills and share insights among participants.
- Exercises in case management to participants to complete independently.

MATERIALS AND EQUIPMENT NEEDED:

- Wall chart: Management of the Patient with Diarrhea.
- ORS packets (for demonstration).
- Containers and water for preparation of ORT.
- Health education pamphlets for prevention, feeding etc....
- White board or flip chart and markers.
- Videotape: Assessment of Dehydration in a Child with Diarrhea.

LEARNING POINTS:

- Epidemiology and Etiology of Diarrhea
 - o Mode of transmission – fecal/oral, contaminated food or water, hand to mouth
 - o Risk factors for acute diarrhea
 - Young age – infant or small child
 - Poor hygiene in family (lack of handwashing, lack of hygiene in cooking or storing food)
 - Absence of sanitary facilities
 - Lack of clean water supply
 - Malnutrition
 - o Seasonal factors – usually more frequent during summer months
 - o Etiologic agents – most common are viruses such as rotavirus, but bacteria and protozoal parasites are also a factor
 - o Invasive diarrhea and secretory diarrhea (dysentery)
 - Often caused by bacteria (enterotoxigenic E. coli, Salmonella, Shigella, Yersinia, Bacillus cereus, Vibrio cholera and parahemolyticus) or by parasites (such as Entamoeba hist. or giardia)
 - Often cause more severe diarrhea and dehydration than viral illness
 - Often associated with fever, toxicity, more severe illness, blood in stools
 - Clinical course may be shortened in some cases by identification and appropriate use of antibiotics or antiparasitic agents, HOWEVER –

assessment and treatment of dehydration is the same as for all diarrheas

- o Other causes of diarrhea
 - Diarrhea alternating with constipation may be irritable bowel syndrome, or fecal impaction in young child
 - Malnutrition
 - Food intolerance such as cow's milk or gluten (wheat or oat products)
- Principles of Clinical Management of Acute Diarrhea
 - o Definition of diarrhea
 - Passage of loose or watery stools, at least three times in a 24-hour period (Note: it is the watery consistency and total volume of the stools rather than the number that is most important. Frequent passing of formed stools is not diarrhea)
 - o Diarrhea and dehydration
 - Dehydration occurs when loss of water and electrolytes (sodium, potassium, chloride, bicarbonate) in diarrheal stool is greater than the oral replacement of these losses
 - o Formulation of Oral Rehydration Solution (ORS solution)
 - WHO formulation:

Ingredient	Grams/L
Sodium Chloride	3.5
Trisodium citrate dihydrate	2.9
Potassium Chloride	1.5
Glucose	20.0
Water	1 liter

- ORS is a balanced solution of salts, glucose and water that allows for absorption of necessary electrolytes and water, even in secretory diarrheas. As glucose is passively absorbed in the bowel, both water and salts are absorbed also.
 - o Effectiveness of ORS solution
 - In most studies, ORS solution alone was as effective in restoring hydration as IV fluids, except in cases of severe shock and hypotension.
 - o Advantages of Oral Rehydration Therapy (ORT) over IV therapy
 - As effective in treating dehydration as IV fluid in most cases
 - Requires less equipment and nursing observation
 - ORT is non-invasive and non-painful
 - Can be administered by non-medical person, such as mother or other care-giver
 - Satisfies natural thirst of child
 - o Reasons for failure of ORT
 - Giving insufficient quantity of ORS for degree of dehydration
 - Giving child too much ORS at one time
 - Stopping ORS because child is vomiting or reluctant to drink
 - Failure to consistently encourage child to take ORS in small, frequent amounts
- Treatment of Diarrhea in the Health Center – Setting up an ORT Corner
 - o Select location for the ORT corner. This should have the following characteristics:

- Be close to staff, for frequent observation. However, it should not be in a crowded passageway
 - Be near a source of water
 - Be near a toilet and washing facilities
 - Be pleasant and well ventilated
 - Arrange furniture in the ORT corner, with:
 - A table for mixing ORS solution
 - A bench or chairs with a back for the mother to hold the child
 - A small table for the cups of ORS solution
 - Organize supplies in the ORT corner
 - ORS packets (at least 60/month)
 - 3 bottles of 1 liter each
 - 3 cups
 - 3 spoons
 - 2 droppers
 - Mother's instruction cards for how to care for a child with diarrhea
 - Soap for handwashing
 - Waste basket
 - Log sheet
 - Display posters and other information about treatment of diarrhea
- Management of Diarrhea
 - Assessment of the patient and degree of dehydration

1. Assess the Child			
▪ General condition	Well , alert	Restless, irritable	*Lethargic or unconscious, *Floppy
▪ Eyes	Normal	Sunken	Very sunken & dry
▪ Tears	Present	Absent	Absent
▪ Mouth & Tongue	Moist	Dry	Very dry
▪ Thirst	Drinks normally, no thirst	*Thirsty, drinks eagerly	* Drinks poorly or not able to drink
2. Feel skin pinch	Goes back quickly	* Goes back slowly	*Goes back very slowly
3. Decide on level of dehydration	The patient has no signs of dehydration (0 – 5%)	If patient has two or more signs, including at least one *sign* there is some dehydration (5 – 10%)	If patient has two or more signs including at least one *sign* there is severe dehydration (>10%)
4. Treat	Use plan A <ul style="list-style-type: none"> ▪ Weigh the patient ▪ Early home 	Use plan B. <ul style="list-style-type: none"> ▪ Weigh the patient ▪ Begin ORS solution in Health 	Urgently use plan C <ul style="list-style-type: none"> ▪ Weigh the patient ▪ Begin IV fluid replacement in

	treatment of diarrhea to prevent dehydration	Center ▪ Reassess after approx. 4 hours	Health Center ▪ Consider referral
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- o **Plan A** – Two Rules for home treatment for no or mild dehydration (0 – 5%)
 - Rule 1 - Give the child more fluid than usual to prevent dehydration – at least 25 – 50 ml/kg in first 4 hours
 - o What fluids to give – recommended home fluids:
 - Suitable fluids ; Normal contain salt: (add salt about 3g/l), such as ORS, salted rice water, yogurt , chicken soup .
 - Not containing salt; plain water, unsalted rice water, yogurt, weak tea (unsweetened).
 - Unsuitable fluids: drinks sweetened with sugar
 - o How much fluid to give – the general rule is to give as much fluid as the child wants until diarrhea stops.
 - Rule II - Continue to feed the child to prevent malnutrition
 - o Breastfeeding should always be continued.
 - o What foods to give: This depends on the child’s age food preferences and pre-illness feeding patterns, cultural practices
 - o Foods are the same as those required by healthy children
 - o Milk (Formula) for the non-breastfed child.
 - o Recommended foods should be culturally acceptable, readily available, energy rich food and contain adequate amount of essential micronutrients.
 - o Use frequent small feedings
 - o Continue giving the same food for at least two weeks after the diarrhea stops.
 - **Note** : If the child will be given ORS solution at home , show the mother how to prepare and how much (ORS) to give her enough packets for two days .

- o **Plan B** – Health Center treatment for some dehydration (5 – 10%)
 - Weigh child as baseline for monitoring rehydration
 - Give 50-100 ml/kg of ORS in first 4 hours
 - Using a clean spoon or cup.
 - Feeding bottle should not be used for babies - use a dropper or syringe
 - Give ORS solution teaspoonful every 1-2 minutes for the child under 2 years, frequent sips from a cup for an older child
 - If child vomits, wait 10 minutes then continue giving ORS slowly
 - Continue breast-feeding even during ORT as appropriate
 - Monitor the progress of therapy regularly and record findings every 1-2 Hrs, then reassess the child fully after 4 hrs and decide what treatment to give next, following the guidelines of plan A, or B or C
 - If child is now hydrated and alert, teach mother how to treat her child at home with ORS and food (plan A)
 - Instruct mother in signs for which she should bring the child back
 - **Note**: If the mother must leave before completing treatment plan B give her enough ORS packets to complete rehydration for two days.

- o **Plan C** – IV rehydration for severe dehydration (>10%)
 - Begin IV fluid immediately at health center, as follows:

	<u>First give Lactated Ringers:</u>	<u>Then give Lactated Ringers:</u>
Infants (under 12 months)	30ml/kg in 1 hour	70ml/kg in 5 hours
Older children (> 12 months)	30ml/kg in 30 minutes	70ml/kg in 2 - 3 hours

- If can not give IV should be referred to hospital within 30 minutes. May give (ORS) solution by nasogastric tube as an interim measure
 - Continue to give ORS if the patient can drink until the drip is completed
 - IV should be administered until radial pulse perfusion and mental status returns to normal, then can take fluids by mouth
 - Assess patient’s progress periodically and record findings every 1-2 hrs until patient is rehydrated.
 - After 6 hrs for infants (or 3 hrs in older patients) reassess the patient and choose what the plan should be conducted to continue treatment (Plan A, B, continue C, or refer to hospital)
 - Be sure that the mother is taught how to continue caring for her child at home
- Treatment of dysentery and persistent diarrhea
 - o Acute bloody diarrhea (dysentery)
 - Request stool study for leukocytes, parasites and bacterial culture, when possible
 - While waiting results of stool studies, treat as outpatient for 5 days with oral antimicrobial recommended for shigella (shigella causes many episodes of bloody diarrhea in children)
 - Teach the mother to feed the child as described in plan A.
 - See the child again after 2 days if:
 1. Under 1 year old
 2. Initially dehydrated
 3. There is still blood in the stool.
 4. Not getting better.
 - Change to a second oral antimicrobial recommended for shigella for another 5 days if the child is not improving
 - If still no improvement after giving the second oral antimicrobial for 2 days should be referred to hospital.
 - o Persistent Diarrhea
 - Continue to give appropriate fluids to prevent or treat dehydration, if it is present .
 - Give antimicrobial to treat diagnosed infection.
 - Encourage a nutritious diet that does not cause diarrhea to worsen (attachment 3)
 - Supplementary vitamins and minerals (attachment 3)
 - Most children with persistent diarrhea can treated at home with careful follow-up to ensure they are improving

- Children should be re-evaluated after seven days .
- Children (especially less than 6 months of age) with persistent diarrhea, or with moderate or severe malnutrition, or with serious systemic infection (such as pneumonia) and should be treated in hospital
- Successful treatment of persistent diarrhea characterized by:
 1. Adequate food intake
 2. Weight gain
 3. Fewer diarrheal stools
 4. Lack of fever .
- Antimicrobials and other drugs
 - An antimicrobial should not be given routinely with diarrhea – give only when bacterial or parasitic infection suspected or proven by stool studies
 - Follow guidelines for use of antimicrobials (attachment 4)
 - Antidiarrhea drugs (diphenoxylate, Imodium) have no practical benefit and never indicated for treatment of acute diarrhea in children

PREVENTION AND HEALTH EDUCATION MESSAGES

- Breastfeeding
- Improved weaning practices
- Use of plenty of clean water
- Hand-washing
- Proper disposal of diapers of young children
- Measles immunization
- Convince mother to use ORT, even if child is vomiting or uncooperative
- Teach mother home management of next diarrheal episode (nutrition and fluids)

CRITICAL ELEMENTS FOR REFERRAL

- Evidence of malnutrition
- Severe dehydration
- Persistent vomiting or severe, watery diarrhea
- No improvement in 3 days
- Blood in the stool

CASE STUDY

Sami is a 10-month old boy who presented to the health center with watery diarrhea and vomiting for the last 16 hours. On examination, his temperature was 39⁰ C., his eyes were sunken, skin pinch goes back slowly, his mouth and tongue were dry and he drinks eagerly.

Topics of discussion:

1. Assess the degree of dehydration
2. Discuss the need for referral to the hospital
3. How would you begin and continue ORT therapy?
4. What would you do to treat the fever?
5. What would you do if he continues to vomit?

CRITICAL ELEMENTS OF COMPETENCE FOR EVALUATION

- Proper assessment of the degree of dehydration
- Recognition of associated problems like fever, dysentery and malnutrition
- Proper preparation and use of ORS solution
- Education of parents in prevention and management of diarrhea

Attachment 3

Give a Nutritious Diet

This is essential treatment for all children with persistent diarrhea.

The normal diet of children with persistent diarrhea is often inadequate . They should be given a diet appropriate for their age , but with a limited content of lactose . In either situation the goal is a daily intake of at least 110 calories / kg .

Feeding of children at home:

The following feeding recommendations should be given :

- 1- Continue breastfeeding
- 2- If yogurt is available give it in place of any animal milk (yogurt contains less lactose and is better tolerated .
- 3- Limit animal milk to 50 ml/kg/day .
- 4- Give other foods that are appropriate for the child's age (as described in plan A).
- 5- Give enough energy to ensure an adequate caloric intake .
- 6- Give frequent small meals at least six times a day .

For older infants and young children, use standard formulas prepared from local ingredients . Two diets are described:

1. The first diet is reduced lactose – contains no more than 3.7 g lactose /kg /day , and provide at least 10% of calories as :
 - Full fat dried milk 11 g (or whole liquid milk 85 ml)
 - Rice 15g
 - Vegetable oil 3.5g
 - Cane sugar 3g
 - Water to make 200m
2. The second diet is lactose free with reduced starch prepared from the following :
 - Whole egg 64g or cooked chicken meat 12g
 - Rice 3g
 - Vegetable oil 4g
 - Glucose 3g
 - Water to make 200ml

This diet provides 70 calories per 100g . Also with this diet 145ml/kg provides 110 calories/kg

Give supplementary multivitamins and minerals

All children with persistent diarrhea should receive supplementary vitamins and minerals each day for two weeks. As a guide, one recommended daily allowance (RDA) for a child aged one year is:

- Folate 50mg
- Zinc 10mg
- Vitamin A 400mg.
- Iron 10mg
- Copper 1 mg
- Magnesium 80mg

Attachment 4

Antimicrobials used to treat specific cause of diarrhea

Disease	Anti-microbial	Children	Adult
		Doses /Frequency / Duration	
Shigella Dysentery	Trimethoprim (TMP) + Sulfamethoxazole (SMX)	5MG/KG+ 25MG/KG Twice/day x 5 days	160mg+800mg twice a day x 5 days
	Nalidixic Acid	15mg/kg 4 times x 5 days	400mg 4 time a day x 5 days
	Ampicillin	25mg/kg 4 times x 5 days	1g 4 times a day x 5 days
Amoebiasis	Metronidazole	10mg/kg 3 times a day x 5 days for severe case	750g 3 times a day x 5 days
Giardiasis	Metronidazole	5mg/kg 3 times a day x 5 days	250mg/kg 3 times a day x 5 days

Steps to treat Diarrhea

