

Shigella Dysentery

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Shigella Dysentery

- Shigellosis continues to be a major public health problem and remains endemic in Sudan
- Surveillance data collected from 11 African countries reported a median incidence rate of bloody diarrhoea of 10.2/1000 population /year
- Cases can be distributed all over the year and seasonal incidence patterns may not be constant over years
- Incidence of shigellosis is usually highest amongst children 1 to 4 years old

- The risk of SD1 outbreaks amongst displaced populations is very high and up to one third of the population may be infected (Attack rates in non-emergency situations are found to be usually 5%)
- The case-fatality without effective prompt treatment may range from 1% to 10%.
- The highest case fatality is observed among children, the elderly and the malnourished.

- Dysentery, often, clinically manifested by “acute bloody diarrhoea” is endemic in many developing countries.
- Endemic dysentery is caused by a number of organisms including bacteria from *Shigella* species.
- Amongst the *Shigella* species, *Shigella dysenteriae type 1* (*Sd1*) represents a particular threat because it is the only strain responsible for causing large scale epidemics of dysentery, particularly amongst displaced population and in refugee camps.
- Other than the *Shigella* species, endemic dysentery may be caused by *Campylobacter jejuni*, enteroinvasive *Escherichia coli*, *Salmonella* and infrequently by *Entamoeba histolytica*.
- Amongst these organisms, *Shigella Dysenteriae Type 1 (Sd1)*

Epidemiology

❖ Infectious agent:

- Most cases of dysentery are caused by *Shigella*. They are classified into four species:
- *S dysenteriae*, *S flexneri*, *S. boydii*, and *S. sonne*. Of these species, one particular
- serotype of *S dysenteriae* family, the *Shigella dysenteriae type 1* (Sd1) represents a particular threat because of the severity of the disease and its epidemic potential

Reservoirs and modes of transmission

- By direct contact with an infected person
- Eating or drinking contaminated food or water
- Flies may also serve as a vector for transmission
- The predominant mode of transmission is by faecal-oral contact
- Transmission of the disease increases with poor hand hygiene, contaminated drinking water, inadequate sanitation and poor toileting behaviours

Risk factors for outbreak

- ❖ The following factors are associated with increased spread and death from an outbreak of dysentery:
 - **Agent:** disease agents may become more virulent or increasingly resistant to available antibiotics
 - **Environment:** overcrowding, inadequate sanitation facilities and contamination of water sources make it easier for dysentery pathogens to be transmitted quickly
 - **Host:** poor hygiene practices (personal, domestic and environmental), poor nutritional status and low immunity prior to infection may favour quick transmission

Case definition

- ❖ The diagnosis of dysentery is usually clinical and made either by observing blood in a fresh stool specimen or by asking the patient, or the mother of a child, whether the stools are bloody
- I. *Suspected case (clinical case definition):* Diarrhoea with visible blood in the stool
- II. *Confirmed case:* A case corresponding to the clinical case definition with laboratory isolation of shigella or any other causative pathogen from the stool

Laboratory confirmation

- An outbreak of dysentery would be laboratory confirmed when the causative pathogens (*Shigella dysenteriae* type 1 or any other *Shigella* species) are isolated from a maximum of 10 to 20 carefully collected stool specimens
- In dysentery outbreaks caused by *Shigella dysenteriae* type 1 (Sd1), most of the organisms (Out of ≥ 70 specimens)
- identified in stool specimens must be Sd1, particularly at the beginning of the outbreak
- Only laboratory isolation of *Shigella dysenteriae* type 1 (Sd1) or any other *Shigella* species from a maximum of 10-20 carefully collected stools specimens from “untreated” patients can confirm the outbreak of a dysentery
- In dysentery outbreaks caused by Sd1, most of the organisms identified in stool specimens must be Sd1, particularly at the beginning of the outbreak

- Once confirmed, it is not necessary to obtain laboratory confirmation for every suspected case in an outbreak situation
- specimens can be collected systematically from 20 to 30 patients during the course of an outbreak in order to check if Sd1 or any other *Shigella* species was still circulating

Early Warning

- Sudden increase of cases as reported by the surveillance system, which is unusual over the same place and period of time

Outbreak Alert

1. There is an unusual number of cases or deaths from acute bloody diarrhoea greater than expected
2. There are clustering of 3-5 or more linked cases
3. There are doubling of cases in two consecutive weeks ; or
4. Shigella Dysenteriae type 1 isolated from one single stool specimen in a refugee/IDP camp

Management of patients with bloody diarrhoea

- All cases of dysentery should be identified quickly as soon as an outbreak has been confirmed so that appropriate treatment with antimicrobials can be initiated without any delay
- Even when the laboratory report is pending, treatment can be started with antimicrobials on the basis of clinical diagnosis alone
- In an epidemic situation, all patients with bloody diarrhoea should be considered as being infected with *Shigella* and be treated with antimicrobials because:

- Epidemics of bloody diarrhoea are essentially caused by *Shigella*, especially *S. dysenteriae* type 1,
- *Shigella* are more likely than other causes of diarrhoea to result in complications and death if effective treatment is not started promptly, and
- Early treatment with an effective antibiotic substantially reduces the risk of severe morbidity or death

Antimicrobials Treatment regimen

Antimicrobials	Treatment regimen	
	Children	Adult
Ciprofloxacin	15 mg/kg 2 times a day for 3 days	500 mg 2 times a day for 3 days
Ceftriaxone	50-100 mg/kg/day IM once a day for 2 to 5 days	1-1.5g/day for 2 to 5 days

Zinc supplementation in children

Zinc	Treatment regimen	
	< 6 months of age	≥ 6 months of age
Liquid (suspension)	10 mg/ day, 14 days	20 mg /day for 14 days
Tablets (20 mg)	½ tablet per day for 14 days	1 tablet per day for 14 days

- Patients whose clinical conditions worsen even after treatment with an antimicrobial for 48 hours and those severe cases and patients at increased risk of death should be referred to hospital
- Treating and preventing dehydration with oral rehydration therapy, or
- Intravenous (IV) therapy if severely dehydrated

- Giving frequent small meals of the patient's usual food; continuing to breastfeed infants and young children
- Chemoprophylaxis of contacts of cases is strongly discouraged

Temporary hospital

- Temporary specialized treatment centres may have to be set up and additional staff recruited in order to cope with influx of patients during large outbreaks. In particular bloody diarrhoea patients should be triaged and oriented towards specific locations (“diarrhoea wards” or “diarrhoea corners”) so that they are separated from other patients;
- Basic hygiene and disinfection measures should be enforced in order to reduce risk of spread of *Shigella* infection

- Bloody diarrhoea patients should be triaged and oriented towards specific locations (“diarrhoea wards” or “ diarrhoea corners”) so that they are separated from other patients;
- Basic hygiene and disinfection measures should be enforced in order to reduce risk of spread of *Shigella* infection

- Appropriate disinfection measures should also be practiced by all persons in contact with bloody diarrhoea patients (health staff and relatives taking care of patients)

Personal Hygiene

- Improvement in personal hygiene including toileting behaviour, such as handwashing with soap holds the key to reduce transmission of dysentery

- Handwashing is particularly important:
 - After defecation,
 - After cleaning a child who has defecated,
 - After disposing of a child's stool,
 - Before preparing or handling food and before eating

- If possible water for washing should be stored separately from drinking water.
- If soap is not available, ash or earth can be used to scrub the hands.
- Washed hands should not be dried with dirty cloths

- Ciprofloxacin is now recommended as the first-line drug for treatment of all patients conforming to the case definition, irrespective of their age.
- Besides ciprofloxacin, pivmecillinam and ceftriaxone are currently the only drugs that may also be used to treat multi-resistant strains of shigella

Response and control strategies for management of dysentery outbreak

- Different public health interventions have to be combined together to stop transmission of dysentery outbreak
- Measures should target at stopping the transmission from the both the “reservoir” as well as the “source” of the infection

- Appropriate case management,
- Personal hygiene (particularly hand washing practices)
- Ensuring drinking water quality with point-of-use water disinfection and safe water storage,
- Improving sanitation conditions,
- Food safety; and
- Appropriate health education altering toileting practices in order to minimize contact between hands and stool and fly control where appropriate

Health Education

- Health education will be key to public awareness and cooperation
- Experienced health educators will play an important role in epidemic control
- Community groups and service organizations can also assist by disseminating messages through their programmes. Specific goals for health education during a dysentery outbreak shall include:

- Active case finding (encouraging all persons who develop bloody diarrhoea to report immediately to the nearest health facility)
- Organizing multiple social mobilization teams so as to cover the entire area affected by the outbreak
- Disseminating information to the public how the infection by *Shigella* is spread and how it can be prevented;

- Messages should, therefore, focus on safe use of water, personal hygiene (latrine
- Use, hand washing, food handling) and disinfection practices. In particular:

- Messages should be spread through home visits, health facilities, schools, religious leaders and the mass media.
- Messages must be carefully prepared, simple and targeted, taking into consideration the local terminology, cultural sensitivities, traditions and beliefs.
- The team responsible for conducting health education sessions should include
 - At-least one member familiar with the community and consist of paramedical staff, health educators, water and sanitation staff and community health workers

Sanitation

- ❖ Measures targeting at improving sanitation for control of the outbreak will include:
 - Safe disposal of human waste through encouraging the use of a pit latrine
 - Provision should be made to establish at-least 1 toilet for a maximum of 20 persons.
 - Toilets should be established no more than 50 metres from the dwellings and at-least 30 meters from any ground water source
 - Safe disposal of children's stool in latrines or through burial in the ground

- Ensuring proper use of latrines, Keeping the latrines clean and daily disinfection of the soil of existing or new structures with a 0.2% chlorine solution
- Designating hand washing stations with soap and adequate water for hand washing near the latrines.

Food safety

- Contaminated food source may also be a risk for continuation of the outbreak of dysentery
- Without ensuring food safety, merely improving sanitation and ensuring safe water supply would not stop the transmission of the outbreak
- Food should be boiled or otherwise made safe before it is consumed or used as an ingredient in food
- Health education for general population should stress messages concerning preparation of food for adults, children and infants
- Some messages might be useful for disseminating information on food safety during the course of an outbreak

Epidemic Control and Preventive Measures

- Early detection and notification of epidemic dysentery, especially among adults, allows for timely mobilization of resources needed for appropriate case management and control.
- National and peripheral-level laboratories should be strengthened so they can reliably confirm Sd1 as the cause of an outbreak.
- Rectal swabs from suspected cases should be collected and shipped to laboratories in an appropriate medium (preferably refrigerated) for culture to confirm the diagnosis of Sd1.

- Laboratories should also be able to determine antimicrobial sensitivity patterns of Sd1 so that rational policies for the use of antimicrobials may be developed. Such policies should consider the antimicrobial sensitivity of local Sd1 strains and the availability and cost of effective antimicrobials.
- Testing of Sd1 isolates for antimicrobial sensitivity should be done at regular intervals to determine whether treatment guidelines remain appropriate

Thanks for Listening