

Original Research**An outbreak of food poisoning following sweet distribution in a school function.**

Agarwal D, Tiwari B ,Choube A,Upadhyay A, Kakkar A

**Abstract:** Following the consumption of sweet distributed during Independence day 2014 celebration in a suburban school, children developed symptoms of gastroenteritis. Children were transferred to our institute for treatment where they were effectively triaged & managed. We report this gastroenteritis outbreak because of the high social impact created & satisfactory outcome following protocol based management. **Objective:** To study the epidemiology, clinical presentation, triaging, laboratory parameters of the cohort. **Study Design:** Retrospective cohort study. **Setting:** Department of Paediatrics, Rama medical college hospital and research centre. **Methods:** Two hundred twenty six children presented to the emergency department for the evaluation 6 hrs after the consumption of the sweet. Only symptomatic children were included in the cohort and further divided as per WHO criteria for dehydration assessment. Laboratory parameters of severely dehydrated children were analysed. Inclusion criteria: Any child presenting with onset of diarrhoea, vomiting, abdominal pain, and fever after ingestion of the sweet. Exclusion criteria: Asymptomatic children. Children included further triaged as per WHO criteria for dehydration assessment. **Results:** 173 were identified with Attack Rate of (AR) of 76.5%. Male to female ratio was 1.3. Children presenting with abdominal pain - 64% diarrhoea- 50% vomiting - 38% and fever 9%. Duration of hospital stay ranged from one to five days. **Conclusion:** We report this gastroenteritis outbreak because of major social impact involving large number of children and high attack rate. Systematic division of cases as per protocol and triaging into different management units lead to effective management and satisfactory outcome.

**Keywords:** Gastroenteritis; Triage; Dehydration.

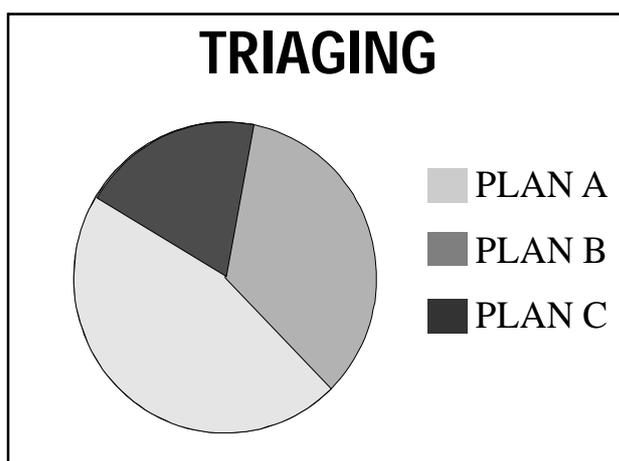
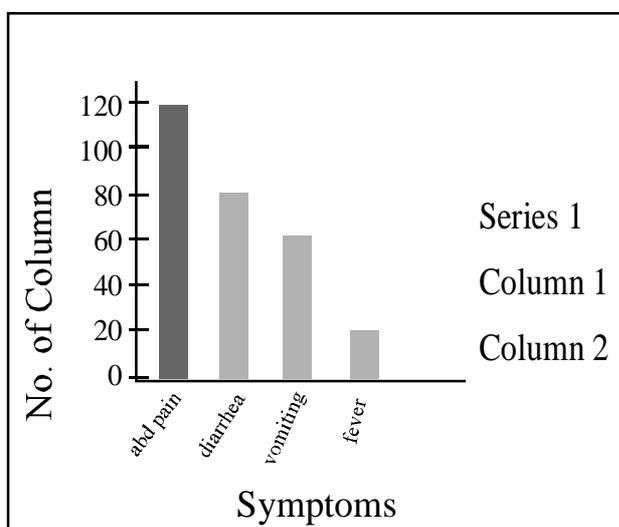
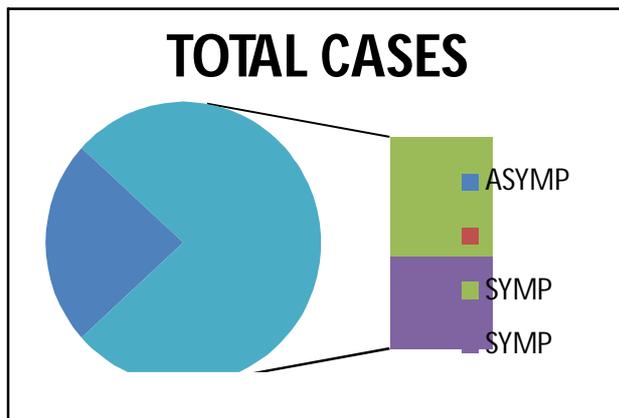
**Introduction**

The term food-borne diseases, including food-borne intoxications and food-borne infections, covers illnesses acquired through consumption of contaminated food, and are frequently referred to as food poisoning. Food-borne disease outbreaks are defined as the occurrence of 2 or more cases of a similar illness resulting from ingestion of a common food or when observed number of cases of a particular disease exceeds the expected number. The global burden of infectious diarrhoea involves 3-5 billion episodes and nearly 1.8 million deaths annually, mainly in young children. Food-borne illness is typically caused by microorganisms or their toxins, and most often manifests with gastro-intestinal symptoms, which can vary in severity and duration. [1] The children arrive in varying states of hydration requiring a multifaceted approach to assessment and treatment. Family members and care providers often arrive with high expectations of advanced treatment unaware of the fact that oral rehydration with close follow-up is the best care for the child. Nurses and physicians can have different perspectives on appropriate therapy leading to huge variation in methods of care even within the same emergency team. Hence a standard protocol is the need for effective and timely management of cases.

**Materials and Method:** Symptomatic children were triaged as per WHO plan A, B & C (Annexure A) for assessment of dehydration. Children categorized as plan A were treated on OPD basis and advised to return if a danger sign appears. Children categorized as plan B were admitted and treated in the pediatric ward and those under plan C were admitted in the intensive care.

**Results:** We identify 226 children during active case finding, and 173 of these were symptomatic. Total attack rate (AR) of 76.5% (173/226). The No. of males were 98(56.6%) and females were 75(43.4%). Male to female ratio was 1.3/1.

**Clinical Symptoms At Presentation:** Clinical symptoms mainly included abdominal pain - 111(64%), diarrhoea-86 (50%), vomiting -66(38%) and fever 16(9%). One child presented with seizure. The median duration of hospital stay was three days (range one to five days). Children were assessed as per WHO plan guidelines (Annexure A) and triaged as plan A- 52(30%), Plan B- 107(61.8%), and Plan C-14(8.2%).



Out of children who went home on plan A therapy, three developed danger signs and were admitted and treated under plan C. Seven of those receiving

plan B therapy developed persistent vomiting hence given intra venous fluid as per plan C.

**Laboratory results:** Children under plan C were investigated for total leukocyte count, serum sodium, potassium, and creatinine. Leukocytosis was reported in nine children. Hyponatremia, hyperkalemia and raised serum creatinine reported in one child.

**Discussion:** Triage is a process for sorting diseased people into groups based on their need for or likely benefit from immediate medical treatment. Triage is used in hospital emergency rooms, when limited medical resources must be allocated.[2] Evaluating dehydration severity is a challenging task. Clinical criteria for the assessment of dehydration were examined in various studies. Signs and symptoms such as ill appearance, dry mucous membranes, sunken fontanelle, sunken eyes, absence of tears, prolonged capillary refill, and reduced skin turgor, can help the clinician to evaluate the degree of dehydration and categorize them into mild, moderate and severe. These conventionally used clinical criteria for evaluating dehydration have been codified by the American Academy of Pediatrics and by the World Health Organization. In the assessment of dehydration, the clinician must look for combination of signs and symptoms.[3] Clinical dehydration scores that combine multiple clinical findings are promising. [4]Bailey et al applied the clinical dehydration scale (CDS) for children with gastroenteritis and correlated it with the length of hospital stay.[5] Kinlin and Freedman evaluated the effectiveness of CDS in children requiring intravenous rehydration.[4]

The sensitivity and specificity of laboratory studies for the detection of dehydration are poor. The majority of children with mild and moderate dehydration do not need laboratory studies. These studies should be used as an adjunctive tool with a comprehensive clinical evaluation in assessing severe dehydration. Clinical reassessment and monitoring of clinical signs during therapy are most important. In every child with severe dehydration, it is recommended that electrolytes urea and creatinine be obtained. [6].

**ANNEXURE A**

Assessment of diarrhea patient for dehydration

	A	B	C
Look at			
a) Condition	Well, alert	Restless, Irritable	Lethargic (or) Unconscious, floppy
b) Eyes	Normal	Sunken	Very sunken & dry
c) Tears	Present	Absent	Absent
d) Mouth and Tongue	Moist	Dry	Very dry
e) Thirst	Drinks normally not thirsty	Thirsty drinks eagerly	Drinks poorly (as not able to drink)
FEEL			
a) Skin pinch	Goes back quickly	Goes back slowly	Goes back very slowly
DECIDE	The pt has NO SIGNS OF DEHYDRATION	If the pt has 2 (or) more signs, including at least one there is SOME DEHYDRATION	If the pt has 2 (or) more signs including atleast one there is SEVERE DEHYDRATION
TREAT	Use treatment plan A	Weigh the pt if possible & use Tmt plan B	Weigh the pt & use Tmt plan C urgently

**ANNEXURE B****TMT PLAN (A) TO TREAT DIARRHOEA AT HOME**

A -Patients first seen with no signs of dehydration can be treated at home.

B- Explain three rule for treating diarrhoea at home

1. Give the child more fluids than usual to prevent dehydration – give home available fluid.
2. Give the child plenty of food to prevent under nutrition continue Breast feeding.
3. Take the child to HW if the child does not get better in 3 days (or) develops
  - (1) Many watery stools
  - (2) Repeated vomiting
  - (3) Marked thirst
  - (4) Poor eating
  - (5) Fever
  - (6) Blood in stool.
  - Give ORS packets to take home. Give enough packets for 2 days. Demonstrate how to prepare and give the solution.

AGE	Amt of soln after each loose stool	Amt of ORS to provide for use at home
(1) < 24 months	50-100 ml	Enough for 500 ml / day
(2) 2-9 yrs	100 – 200 ml	Enough for 1000 ml /day
(3) 10 yrs (or) more	As much as wanted	Enough for 2000 ml / day

**PLAN (B) TO TREAT SOME DEHYDRATION**

Approx ORS in just 4 hrs

Age	< 4 months	4-11 months	12 – 23 months	2-4 yrs	5 – 14 yrs	> 15 yrs
Weight in kg	< 5 kg	5-7.9 kg	8 – 10.9 kg	11 – 15.9 kg	16 – 29.9 kg	> 30 kg
ORS soln in ml	200 – 400	400 – 600	600 – 800	800- 1200	1200-2200	2200-4000

NB :- 1. Use pts age only when you do not know that the wt. Approx amt of ORs required (in ml) can be calculated by multiplying pts wt in gms x 0.075.

2. If child wants more ORs give more
3. Encourage the mother to continue Breast feed.
4. For infants < 6/12 , if not breast fed, give 100 – 200 ml clean water during this period.

Observe the child carefully & help the mother give ORS soln:-

- 1) Show her how much ORS soln to be given to child.
  - 2) A teaspoonful every 1 – 2 minutes & 2 yr; frequent tips from a cup for older child.
  - 3) When vomiting is present, wait 10 mts and continue ORS slowly.
  - 4) If the child's eyelids become puffy, stop or and give plain water (or) breast milk, give ORS according to plan A when puffiness is gone.
- After 4 hrs reassess the child using the Assessment chart. Then select plan A,B (or) C to continue treatment.

Reassessment after 4 hrs

No signs of dehydration → plan A

Some dehydration → Repeat plan B but start milk juice and food

Severe dehydration → Start plan C

Treatment plan C to treat severe Dehydration

- 1) Can give IVfluid immediately → Start IVFluid ; if the pt can drink give ORS until drip is ready.

Give 100 ml / kg RL (or) NS

Age	First give 30 ml /kg in	Then give 70 ml / kg in
Infants	1 hr	5 hrs
Older	30 mts	2 ½ hrs

- Reasses the pt every 1 – 2 hr If no improvement → give IV drip most rapidly.
- Also give ORs as soon as pt can drink.
- Evaluate the pt using Assessment chart after 6 hrs (or) 3 hrs and choose appropriate plan A / B / C to continue treatment.

\*] World Health Organisation, -www.who.org

ORS is the preferred treatment of fluid and electrolytes losses caused by diarrhea in children with mild to moderate dehydration. Children who have diarrhea and are not dehydrated should continue to be fed age-appropriate diet. Children who require rehydration should be fed age-appropriate diet as soon as they have been rehydrated. Breast feeding should be continued throughout the rehydration. The intravenous route should be used to treat any moderately dehydrated child who has persistent vomiting or who does not tolerate oral rehydration. Also, ORS administration requires caregiver's compliance. If such personnel are not available, IV therapy is indicated. In addition, children with extreme fatigue, illeus or gastrointestinal distention may not be candidates for oral rehydration. [7]

**Conclusion:** We report this gastroenteritis outbreak because of major social impact involving large number of children and high attack rate after consuming the sweet distributed in a school function. Systematic division of cases as per protocol and triaging into different management units lead to effective management and satisfactory

outcome. Regular reassessment at timely interval by trained staff helped in early diagnosis of treatment plan failure and prompt measures could be taken. Subdivision of children into different groups also helped in better handling of manpower. Resources were directed towards the severely affected children hence effective utilization of same could be done. This study will serve as a guide to others for handling a similar situation in face of limited resources.

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