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Concept Of Food Poisoning : A Modern Review

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ABSTRACT

Ayurveda is a 'Science of Life' which provides curative as well as preventive principles for healthy and long life. The ancient Ayurvedic classic texts namely the Samhitas of charak, Sushruta and Vagbhata and the subsequent treatises have invariably given detailed description of food poisoning, its causes, types, pathology and the line of management and treatment both preventive and curative. Food borne illness are the commonest health problems encountered world-wide, and are particularly rampant in Third World countries such as India, mainly due to a relative lack of sanitation and public hygiene. The term food poisoning in its wider sense includes all illness which results from ingestion of food containing non-bacterial or bacterial products. In other words, it is an acute gastroenteritis caused by ingestion of food or drink contaminated with either living bacteria or their toxins or chemical substances and poisons derived from plants and animals. Acute gastroenteritis is a major cause of morbidity and mortality. The majority of episodes may be directly linked to infection or infectious agents spread by the faecal-oral route and transmitted either on for mites, on contaminated hands, or in food or water. The chief symptoms are headache, giddiness, intense thirst, acute vomiting, diarrhoea, colicky pain, slow pulse, rigors and cramps. Measures such as the provision of clean potable water, appropriate disposal of human and animal sewage with separation from water supplies, and simple principles of food hygiene are all very effective means of halting the spread of these infections. Fluid replacement, ideally oral, is vital in the management of these cases**.**

Keywords: *Bacteria, Food, Infectious agents, Management, Medicolegal Aspects, Postmortem Findings, Toxins.*

1. INTRODUCTION

Food poisoning means illness resulting from ingestion of food with microbial or non- microbial contamination. The condition is characterized by (a) history of ingestion of a common food (b) attack of many persons at the same time, and (c) similarity of signs and symptoms in the majority of cases. According to the WHO, each year 600 million people around the world, or 1 out of 10 become ill after consuming contaminated food. Among all these people, 420,000 die, including 125,000 children under 5 years of age, due to the vulnerability of this population to develop a diarrheal syndrome, about 43% of food poisoning occur in these patients. About 70% of food poisoning results from food contaminated with a microorganism. Our lifestyles have changed over a last few years. We all lead busy lives and as a result of that tend to spend less time preparing and cooking food. People often cook several meals in advance and freeze them for a long period of time or buy convenience food which only has to be put in a microwave oven. This is the reason for increasing food poisoning cases in present scenario.

Causes of Food Poisoning

A. Microbial Contamination

1. Bacteria

- Bacillus cereus
- Staphylococcus aureus
- Salmonella group (except S.typhi)
- Shigella
- Vibrio

- Escherichia coli
- Campylobacter
- Yersinia enterocolitis

Clostridium.

2. Viruses
   - Rotavirus
   - Adenovirus
   - Parvovirus

3. Protozoa
   - Giardia lamblia

4. Fungi
   - Aspergillus flavus
   - Fusarium roseum

B. Non-microbial Contamination

1. Vegetable origin
   - Lathyrus sativus
   - Mushroom
   - Argemone Mexicana

2. Animal sources
   - Poisonous fish like shell fish, scombroid fish etc and mussels.

3. Chemical
   - Flavouring agents
   - Coloring agents
   - Preservatives

Classification of Food Poisoning

A. Bacterial

1. Infectious type
2. Toxin type
3. Botulism

B. Non-bacterial

1. Toxic plant food
2. Toxic animal food
3. Chemical

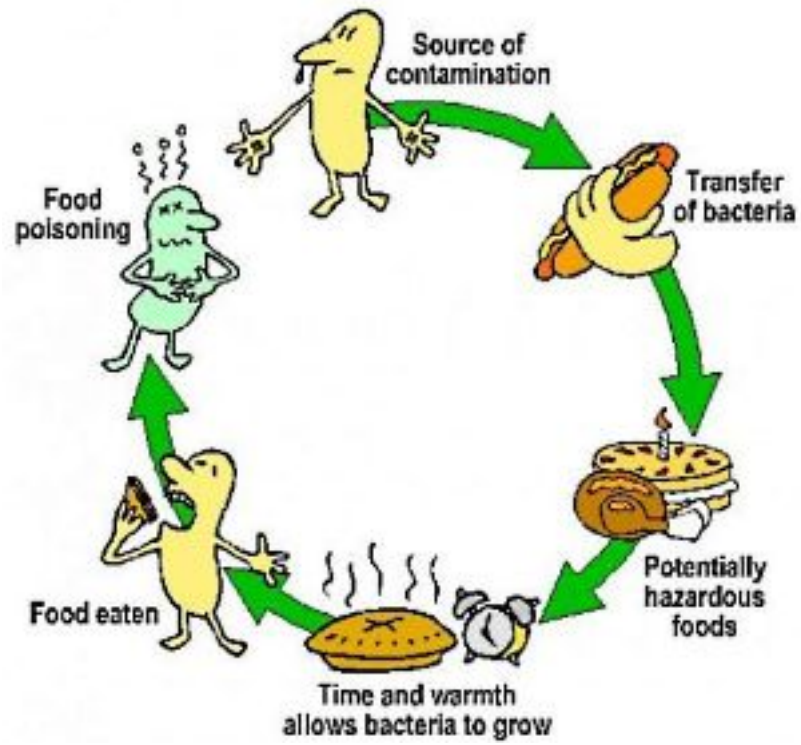
Mechanism of Food poisoning

1. Non-inflamatory
2. Inflamatory
3. Penetrating

Gastrointestinal Pathogens Causing Acute Diarrhea

S.No	Mechanism	Location	Illness	Stool Findings	Pathogen Involved
1	Non-Inflamatory (Enterotoxin)	Proximal small bowel	Watery Diarrhea	No fecal leukocytes;mild or no increase in fecal lactoferrin	Vibrio cholera, Enterotoxigenic Escherichia coli,Bacillus

					cereus, Staphylococcus aureus, rotavirus, etc.
2	Inflamatory (Invasion or Cytotoxic)	Colon or distal small bowel	Dysentery or inflammatory Diarrhea	Fecal polymorphonuclear leucocytes; substantial increase in fecal lactoferrin	Shigella spp, Salmonella spp, Entamoeba histolytica, etc.
3	Penetrating	Distal small bowel	Enteric fever	Fecal mononuclear leukocytes	Salmonella typhi, Y.enterocolitica



Symptoms of Food poisoning

- Fever
- Vomiting
- Nausea
- Dizziness
- Diarrhoea
- Sweating
- Thirst
- Headache
- Confusion
- Abdominal Pain
- Cramps
- Weakness
- Loss of memory (in case of long time food poisoning)
- Eye disorder (in case of long time food poisoning)
- Hormonal disbalance (in case of long time food poisoning)

Clinical Feature of Specific Bacteria and Food Poisoning

S.No	Organism	Incubation	Sign & Symptoms	Sources
1	Staphyloccus aureus	1-6 H	Nausea, vomiting,diarrhea	Ham, poultry, potato or egg salad, cream pastries
2	Bacillus cereus	1-6 H	Nausea, vomiting, diarrhea	Fried rice
3	Clostridium perfringens	8-16 H	Abdominal cramps,diarrhea, vomiting	Beef, poultry, legumes, gravies
4	B.cereus	8-16 H	Abdominal cramps, diarrhea, vomiting	Meats, vegetables, dried beans, cereals
5	Vibrio cholerae	>16 H	Watery diarrhea	Shellfish
6	Enterotoxigenic E.coli	>16 H	Watery diarrhea	Salads, cheese, meats
7	Entero-heamorrhagic E.coli	>16 H	Bloody diarrhea	Ground beef, roast beef, raw milk, raw vegetables, apple juice
8	Salmonella spp.	>16 H	Inflammatory diarrhea	Beef, poulty, egg, dairy products
9	Campylobacter jejuni	>16 H	Inflammatory diarrhea	Poultry, raw milk
10	Shigella spp.	>16 H	Dysentery	Potato or egg salad, lettuce, raw vegetables

Complications

S.No	Complication	Comments
1	Chronic diarrhea • Lactase deficiency • Small-bowel bacterial overgrowth • Malabsorption syndrome (topical and celiac sprue)	Occurs in ~ 1% of travellers with acute diarrhea • Protozoa account for ~1/3 of cases
2	Initial presentation or exacerbation of inflammatory bowel disease	May be precipitated by traveler's diarrhea
3	Irritable bowel syndrome	Occurs in ~ 10% of travellers with traveler's diarrhea
4	Reactive arthritis (formerly known as Reiter's syndrome)	Particularly likely after infection with invasive organisms (Shigella, Salmonella)

Diagnostic Approach

Diagnosis is generally clinical but can be made by isolating the bacteria from the vomit, urine or faeces and the suspected foods, or from the bowels and solids organs of the sufferer after death, and identifying them by cultural characteristic and agglutination tests. The main diagnosis criteria of food poisoning

- History
- Clinical picture
- Stool analysis
- Suspect food/ agent analysis
- Measurement of serum electrolytes

General Principles of Treatment

1. Oral Rehydration Therapy (ORT)
2. Intravenous Rehydration Therapy
3. Non-specific Antidiarrheal Agents
4. Symptomatic Treatment

Prevention

1. Buying groceries
2. Storage
3. Temperature requirements
4. Hygiene
5. Dining out
6. Foreign travel

Postmortem Findings

1. The mucosa of the GIT is swollen and often intensely congested, and there may be minute ulcers.
2. Microscopic examination shows fatty degeneration of the liver.
3. The causative organism can be isolated from the blood and viscera.

Medicolegal Apects

1. Accidental
2. Homicidal
3. Suicidal

2. CONCLUSION

Food poisoning is a common infection that affects millions of people in the India each year. Most commonly, patients complain of vomiting, diarrhoea, and cramps abdominal pain. People should seek medical care if they have an associated fever, blood in their stool, signs and symptoms of dehydration, or if their symptoms do not resolve after a couple of days. Treatment focuses on keeping the patient well hydrated. Most cases of food poisoning resolve on their own. Prevention is a key and depends upon keeping food preparation areas clean, good hand washing, and cooking foods thoroughly. Food poisoning is the name for the range of illnesses caused by eating or drinking contaminated food or drink. It is also sometimes called food borne illness..

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