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Foodborne diseases outbreak in India: A review

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Abstract
Foodborne diseases have caused increased in frequency of mortality and morbidity in India. Outbreaks of foodborne diseases due to microbiological and environmental contaminants was observed in our country. In most of the outbreaks the etiological factors were identified and prevention was recommended. Food borne illness were grouped under intoxication and infection by various bacterial species like *Clostridium, E. coli, Botulism, Salmonella and staphylococcus* infected to major food items. So everybody should take food safety precautions for prevention of foodborne diseases.

Keywords: food, diseases, toxic, microorganism

Introduction
Safe food and water is a public health requirement. Safety refers to all hazards that make food injurious to health. Food safety is intricately woven with food security and nutrition, while chronic food insecurity is associated with poverty and arises due to continuous inadequate diet, transient food insecurity is related to the risks related to the availability of food that is safe for human consumption [1]. Foodborne disease, or food poisoning is defined as acute or subacute non-infectious diseases caused by biological or chemical agents that enter the body through ingestion of food. Food poisoning must be suspected when an acute illness with gastrointestinal or neurological manifestation affect two or more persons or animals who have shared a meal during 72 hours. The term generally used encompasses both food related infecion or food related intoxication [2]. The main causes of foodborne illness are bacteria (66%), chemicals (26%), virus (4%), parasites (4%). Food get contaminated from plant surfaces, animals, water, sewage, air, soil or from food handlers during food handling and processing. In sum, there are over 250 infectious and non-infectious agents that may contaminate food and many recognized food vehicles [3]. Thus, adding to the complexity of foodborne illness, foods can become contaminated at multiple points along the food's journey from production to consumption [4].

Origin of foodborne illness
The pathogenic organisms transmitted through contaminated foods are bacteria, viruses, protozoa and helminths. Foods that are contaminated may not look, taste or smell any different from foods that are safe to eat. A review of recorded foodborne disease outbreaks in India from 1980 to 2016 shows *Staphylococcus aureus, Vibrio species, Salmonella species, E.coli, Yersinia enteroclitica*. Salmonella is the most common cause of foodborne illnesses while *Listeria monocytogenes* can even grow inside the refrigerator in ready-to-eat food [5]. Staphylococcus aureus bacteria grow in food and produce toxins that cause staphylococcal food poisoning. Food-borne diseases impose enormous financial burden on health care services, routine observations and public health investigations can cause substantial productivity impacts and product recalls by the food industry. Origin reconstruction is a complex problem because the effects of contaminated food typically occur with a significant time delay and incidence patterns are geographically unclear as some specific transport pathways are generally not monitored. Different foods implicated in foodborne outbreaks in India are milk and milk products such as kheer, meat, poultry, fish, fowl, buttermilk and sweets, sea food such as prawns; cooked and uncooked rice; tamarind, and cooked as well as uncooked vegetables [6].

Table 1: Classification of Food-borne diseases

S. No	Food Items	Microorganism	Disease	References
1	Meat, Milk, Poultry	*Salmonella typhi*	Typhoid fever	Russels. Flower, 2004
2	Milk, Flour, Egg	*Shigella*	Shigellosis	Russels. Flower,2004
3	Fruits,Vegetable	*E.coli*	Food poisoning	Woese CR, 1990
4	Raw vegetable Milk, cheese	*Listeria monocytogenes*	Meningitis, Pneumonia	Ingrid Koo, 2018
5	Unpasteurised milk and cheese products	*Staphylococcus aureus*	Food poisonin	CD Alert, 2017
6	Buttermilk, Mutton	*Yersinia enterocolitica*	Yersiniosis	J.C Heaton *et al*., 201
7	Lettuce, Tomatoes	*Salmonella*	Gastroentiritis	K.L Newman *et al*., 2015
8	Raw dairy product	*Campylobacter*	Campylobacteriosis	Sudershan *et al*., 2010
9	Unpasteurised milk, undercooked meat	*Brucella*	Brucellosis	Sudershan *et al*., 2010
10	Undercooked seafood	*Vibrio*	Gastroentiritis	Sudershan *et al*., 2010

Foodborne Disease India

In India, majority outbreaks of foodborne disease go unrecognized or un-investigated and may be noticed only after any major health or economic damage has occurred. In such a condition controlling the outbreaks, detection and removal of implicated foods, identification of the factors that contribute to the contamination [7], survival and distribution of the suspected agent, prevention of any future outbreaks and strengthening of food safety policies and programmes is not possible. Foodborne disease observation is one of the most important components of food control systems and food safety concerns are gaining importance in view of the fact that India has been registered for WTO agreement and therefore has to follow sanitary and phyto sanitary (SPS) measures [8]. Foodborne disease observations would be required to generate a data on nature of the hazard, extent of contamination in foods and the types of food that are likely to be contaminated and to develop remedial measures.

Prevention

Prevention of foodborne illness (often referred to as food poisoning) is a major concern in the food service establishment. Foodborne illness is often used to describe any disease or illness caused by eating contaminated foods or drinks [9]. Almost all reported cases of foodborne illness are caused by bacteria or by their poisons. This poison is commonly formed in food before it is eaten and cannot be detected by taste, odour or colour. While there are other microorganisms that can cause foodborne illnesses [10].

Food Safety Precautions to Be Followed For Food Safety

- Washing of all raw vegetables and fruits before eating.
- Drink and eat only pasteurized dairy products (milk, cheese, yogurt and ice cream) and juices.
- Cook of all meats (meat, poultry and seafood) should be done thoroughly.
- Hands should be washed along with kitchen work surfaces and utensils after contact with raw meat or poultry.
- Prevent contact of cooked foods with raw foods (i.e., raw meat, and poultry).
- Cleaning and sanitizing of all utensils, equipment and surfaces (cutting boards, work counters, etc.) before and after each use.
- Avoid preparing food for others if the person is already in contact with any disease.

Conclusion

Foodborne diseases have caused one of the greatest health hazardsin India. Outbreaks of foodborne diseases due to microbiological and environmental contaminants was observed on large scale. In most of the outbreaks the etiological factors were identified and prevention was recommended. Food borne illness were grouped under intoxication and infection by various sources of bacteria and other microorganisms. So everybody should take food safety precautions for prevention of foodborne diseases.The health authorities should strengthen considerably the foodborne disease awareness programs and regulate it with efficient education and extension activity in various aspects of food safety.

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