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PREVALENCE AND ANTIBIOGRAM PATTERN OF BACTERIA ISOLATED FROM FOOD PRODUCT (BURGER) OF STREET FOOD VENDORS OF PAONTA SAHIB

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ABSTRACT

This study conducted on the food safety practices by street-food vendors in Paonta sahib and little is known on the microbiological quality of street-purchased burgers. Microbiological analysis was conducted on 100 samples of burger. 100 food samples were collected from random restaurants of fast and traditional fast foods in Paonta sahib and investigated for bacteria species. A total of 225 isolates were recovered from 100 samples. The samples were collected from the various restaurants and street vendors in Paonta sahib. It was observed that burger sample have the prevalence of *Escherichia coli* (42.22%), *Salmonella* (31.11%) and *Staphylococcus sp.* (22.66%), *Escherichia coli sp.* showed the highest percentage. The isolated bacteria showed the sensitivity against some of the antibiotics. The Amoxycillin, Ciprofloxacin, Gentamicin, Ofloxacin and Tetracycline were very effective against the *Salmonella, Staphylococcus aureus* showed high resistance to Chloramphenicol in the present study. The presence of foodborne pathogens posed some potential risks to consumers.

INTRODUCTION

Microbial infections of food borne origin are a major public-health problem internationally and a significant cause of death in developing countries (WHO, 2006). Food safety in developing countries is influenced by a number of factors. In the context of wastewater irrigation, the main concern is the increasing environmental pollution in urban areas, which does not support the changing behaviour of urban consumers towards more international diets, in particular fruits and salads that are eaten raw. There is a high risk of contamination (not only affecting fruits and vegetables) at all stages of production, processing and distribution which are very difficult to control through regulations given the common constraints in supporting infrastructure and institutional capacities. Quantitative microbial risk assessment can help in identifying critical control points (Seidu *et al.*, 2008). The street food industry plays an important role in developing countries in meeting the food demands of the urban dwellers. Street foods feed millions of people daily with a wide variety of foods that are relatively cheap and easily accessible. The street food industry offers a significant amount of employment, often to persons with little education and training (Latham MC, 1997). Furthermore, it was reported the prevalence of *Campylobacter spp., Staphylococcus spp., Escherichia coli, Salmonella spp., Yersinia Spp.* and *Listeria* on meat, sea foods, vegetable ingredients, chicken shawarmas, raw and cooked foods, raw chicken, beef burger sandwiches, ready-to eat salad vegetables, commercial mayonnaise, frozen chicken, poultry products and on the hands of food workers (Kaneko *et al.*, 1999 and Pelczar *et al.*, 2006). Street foods are also quite popular and are available at all public places like busy markets, parks, road side etc. Urbanization with associated poverty and need for cheaper food have further resulted in its expansion (Food safety news letter). Most of the studies done on street foods in India and abroad had indicated that these foods are not meeting the microbiological standards and are contaminated with various pathogens viz. *Escherichia coli, Vibrio, Salmonella, Listeria etc.* (Chiou *et al.*, 1996; Ryu *et al.*, 1998; Fang *et al*., 2003; Lewis *et al.*, 2006). Microbial food safety is an increasing public health concern worldwide. It is estimated that each year in the United States there are approximately 76 million food borne illnesses cases are caused by *Campylobacter spp.*, non typhoidal *salmonella*, pathogenic *Escherichia coli* all colonize the gastrointestinal tracts of a wide range of wild and domestic animals, especially animals raised for human consumption. Dangerous microorganisms are found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially chopping boards. The slightest contact can transfer them to food and cause food borne disease. Examples of zoonotic pathogens that may be transmitted in this way include *Salmonella, Campylobacter, Escherichia coli* and eggs of the tape worm, *Taenia solium*. The gut is the most important source of bacteria, contributing *Clostridium perfringens, Coliforms, Salmonella* and *Staphylococcus* to the meat surface. Mesophiles, including pathogens, cannot grow on chilled carcasses, but psychrotrophs of the *Pseudomonas, Achromobacter* grow readily, and eventually spoil the meat (Meng and Doyle, 1998).

MATERIAL AND METHODS:

Food sample collected from college canteen and road side will be used for isolation. From each sample 25 g was aseptically weighed and macerated and 225 ml of sterile distilled water was added and shake for 1hr in incubator shaker at 37^0C. Sterile dilution was carried out using sterile distilled water as diluents. From each dilution 50 µl was spreaded using the spread plate

methods. Enriched sample were then streaked on Nutrient agar media. The various morphological characteristics of recovered isolates viz., colony morphological (Colour, Shape, Arrangement and Gram staining) were studied. The various biochemical tests Indole test, Methyl Red, Voges-Proskauer test, Citrate Utilization test, Carbohydrate Fermentation test, Nitrate reduction test and Catalase test were carried out for identification of isolates (Holt *et al.*, 1994). Bergey's Manual of determinative bacteriology, 9th Ed.

RESULTS:

A total of 225 isolates were recovered from 100 samples. The samples were collected from the various restaurants and street vendors in Paonta sahib. The isolates were characterized and identified on the basis of morphological characterization such as gram staining reactions, colony characteristics and biochemical test Holt *et al*., 1994.(Cappuccino and Sherman Microbiology A Laboratory Manual 7th edition). Based on the morphological and biochemical characterization. It was observed that burger sample have the prevalence of *Escherichia coli* (42.22%), *Salmonella* (31.11%) and *Staphylococcus sp.* (22.66%). *Escherichia coli sp.* showed the highest percentage. The isolated bacteria showed the sensitivity against some of the antibiotics. The Amoxycillin, Ciprofloxacin, Gentamicin, Ofloxacin and Tetracycline were very effective against the *Salmonella, Staphylococcus aureus* showed high resistance to Chloramphenicol in the present study.

DISCUSSION:

These results showed that inanimate food samples were contaminated with various bacterial pathogens. The bacterial prevalence was higher in food samples from road side street vendors than those from samples from college canteen and other restaurants. Neela Badrie *et al.2000,* studied in all cases, the assemblage and serving of burgers was facilitated by the use of tongs. No to low microbial risk was noted in samples for 81.5% *Salmonella*, 71.4% *Staphylococcus aureus* and 96.3% *Escherichia coli* of samples. According to this study *Escherichia coli* shows higher prevalence that was similar to our results which also shows higher prevalence of *Escherichia coli* in fast food sample. According to Al-Bahry S., 1999 some antibiotics were found to be more effective against the *Salmonella* strains studied (Amikacin and ciprofloxacin) while others were less so. Wendy M. Eseau., 2003 state that Tetracycline and Sulfisoxazole is the most effective against *Escherichia coli* bacteria, however Sulfisoxazole is a sulfa drug and therefore synthetic and not technically a true antibiotic. In this study Al-Bahry S., 1999 and Wendy M. Eseau., 2003 found Amikacin, ciprofloxacin and Sulfisoxazole, Tetracycline to be more effective against the *Salmonella* and *Escherichia coli* but in our study Amoxycillin, Ciprofloxacin, Gentamicin, Ofloxacin and Tetracycline were very effective against the *Salmonella* and *Staphylococcus aureus* showed high resistance to Chloramphenicol. Kay *et al.*, 1994 reported the effect of microorganisms on human health, distribution and presence of pathogenic microorganisms in traditional fast foods and fast foods from different restaurants, that important to human and to discuss their role in the food poising and also the causation of many human diseases. Studies on isolation of pathogenic bacteria, fungi and yeasts from fast foods and traditional foods in this investigation indicated that some gram negative bacteria and gram positive bacteria were isolated. Fang *et al.,* 1999 reported the risk of the presence of other pathogens in food and water samples which is further substantiated by the isolation of various pathogens. It concluded that these foods can endanger public health by causing various acute and chronic food borne diseases through pathogenic microbes or toxic substances present in them.

IMPACT OF STUDY:

Most of the studies done on street foods in India and abroad had indicated that these foods are not full fill the microbiological standards and are contaminated with various pathogens viz. *Escherichia coli, Vibrio, Salmonella, and Listeria* etc. The presence of pathogens in high counts suggests a potential risk to the consumers because these can cause food poisoning. Several investigations on ready to eat and street foods also reported the microbial contamination.

ABBREVATIONS

^{0}c	Degree Celsius
g	Gram
hr	Hour
L	Litre
Mg	Milligram
µl	Micro litre
ml	Millilitre
NA	Nutrient Agar
%	Percentage
sp.	Species
Sol.	Solution
WHO	World Health Organization

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REFERENCES:

1. Al-Bahry S., Antibiotic resistance of Salmonella isolated from Muscat. Pakistan journal of biological sciences (1999), 2,523–8.
2. Chiou, T.Y., Wang, M.Y., Lin, A.Y., Sanitary indicator bacteria of the hot-keeping cooked food items in Southern Taiwan. Food Sci. (1996). 23, 909-912.
3. Fang, T.J., Chen, C.Y., Kuo, W.Y., Microbiological quality and incidence of Staphylococcus aureus and Bacillus cereus in vegetarian food products. Food Microbial(1999). 16, 385-391.
4. Kaneko K, Hayashidani H, Ohtomo Y, Kosuge J, Kato M, Takahashi K, Shiraki Y and Ogauwa M., Bacterial contamination of ready to eat foods and fresh products in retail shops and food factories. J Food and Drug Analysis (1999). 1,105-115.
5. Kay BA, Griffin PM, Stockbine NA and Wells JG., Too fast food bloody diarrhea and death from Escherichia coli 0157: H7. Clin Microbial News (1994). l 16, 17-19.
6. Latham MC., (1997). Human nutrition in tropical Africa. FAO, Rome, 329-437.
7. Lewis, J.E., Thompson, P., Rao B.N., kalavate, C., Rajanna, B., Human bacteria in street vended fruit Juices; A case study of Visakhapatnam city, India. Internet Journal Food safety (2006).8, 35-38.
8. Meng J and Doyle MP. Emerging and evolving microbial food borne pathogens. Bull Inst Pasteur (1998)96,151-164.
9. Neela Badrie, Andrew Joseph and Allyson Chen .An observational study of food safety practices by street vendors and microbiological quality of street-purchased hamburger beef patties in Trinidad, West Indies', Internet Journal of Food Safety(2000). 3, 25-31.
10. Pelczar MJ, Lewis, R.C., Restaurant advertising: appeals and consumer intentions. J. Advertising Research(1981). 21 (5), 67-74.
11. Seidu, R., Heistad, A., Amoah, P., Drechsel, P., Jenssen, P. D. and Stenstrom,T., 'Quantification of the health risk associated with wastewater reuse in Accra, Ghana: A contribution toward local guidelines', Journal of Water and Health(2008). 6(4), 461–71.
12. Wendy M. Eseau., Which Antibiotic Is Most Effective Against Escherichia coli? California state science fair. (2003).
13. World Health Organization (WHO).,. Essential safety requirement for street-vended foods. Revised edition. Geneva; (1996) p. 10.