SHORT COMMUNICATION

Study of Bacterial Colonisation of Rice and Milk from Eateries in and Around A Tertiary Care Hospital

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ABSTRACT

Bacteria can be efficiently transmitted by milk and rice and can cause different diseases like diarrhoea and dysentery. Hence it is very important to study and monitor the occurrence of these pathogenic bacteria in food sampes like cooked rice and milk. Our study was ojne such project to note the occurrence of pathogenic bacteria in the menntioned food samples.

Keywords: Pathogenic bacteria, cooked rice, milk.

How to cite this article: Bhattacharyya S, Sharma G, Sarfraz A, Jaiswal NK, Kumar R, Sengupta A, Singh S, Kumar A. Study of bacterial colonisation of rice and milk from eateries in and around a tertiary care hospital. International Journal of Contemporary Medical Research 2015;2(4):873-874

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Source of Support: Nil

Conflict of Interest: None

INTRODUCTION

Food items like cooked rice is a potential source of spread of pathogens like *Bacillus cereus.*[1] *B. cereus*, a Gram positive sporulated bacteriujm, can produce emetic toxin even at 15 deg C.[2] Raw or unpasteurised milk is also a very important source of deadly infections like E. coli O157:H7 and *Salmonella* spp.[3] Keeping these things in mind, our study was planned to study the occurrence of these bacteria in cooked rice and milk.

MATERIALS AND METHODS

This was a laboratory-based observational study (pilot study), carried out in Department of Microbiology, AIIMS Patna from Mid-June to End of July, 2015.

Sample collection

Cooked rice sample was collected from different eateries like student's mess, canteen, cafeteria outside the istitue's front gate, and other places. The samples were collected without informing the cooks or staff of these eateries. Cooked rice was collected in sterile polypropylene petri dishes, by wearing gloves abd taking sterile precautions.Altogether, 6 different rice samples (from 6 different sources) were studied.

Initially the weight in Grams, of the empty petri dishes were noted, and then the weight of petri dish along with rice sample, was noted. The difference indicated weight of the rice.

Similarly milk samples were collected, without informing the staff, from the same places. like mess, canteen, cafeteria in front of the institute's gate and other places, in sterile borosilicate glass test tubes. Altogether, 5 different rice samples (from 6 different sources) were studied

Inoculation

Rice sample was first vortexed well in 2 ml Phosphate buffered saline (pH: 7.2) and 10 micrilit. was inoculated on Chocolate agar and MacConkey agar plates. The plates were incubated overnight and the next day, colonies were seen and processed further for identification. Identification was dne using standard Gram staining method and routine biochemical tests, like Catalase and Coagulase (in case of Gram positive bacteria) and Indole production, Citrate utilisation, motility, H2S production etc. for Gram negaativebacteria. Colony count was done manually from the plates.

Milk sample was taken, and 10 microlitre was inoculated on Chocolate agar and MacConkey agar plates, and 1 test tube of Robertson's cooked meat medium. The plates and tubes were incubated overnight and the next day, colonies were seen and processed further for identification as done in case of rice samples. The tubes of Robertson's cooked meat were also observed for clot formation and turbidity, and Gram stain was also done

from it to detect Gram positive sporulating bacilli with bulging spores, if present. Colony count was also done manually from the plates.

RESULTS

The most commonly isolated bacterium from rice samples was *Acinetobacter* spp.(2 isolates), followed by, *E. coli*, *Moraxella catarrhalis* and *Pseudomonas aeruginosa*. Only 1 eatery showed no growth of any bacterium in rice.

The most commonly isolated bacterial strain from milk samples were *Acinetobacter* spp. and *Staphylococcus aureus (*2 isolates each). *Clostridium* spp. was not isolated from milk samples.

All the *S. aureus* isolates (number: 2) were Methicillin sensitive, as detected by Oxacillin 1 microgram Disk diffusion (Tulip Microexpress, Goa, India) on Mueller Hinton agar.

The colony count of *E. coli* (1 isolate) from rice sample was 8.33 X 10^2 CFU/gm, and it was sorbitol fermenting (possibly not Enterohemorrhagic type). It was isolated from eatery outside front gate of the institute.

Staphylococcus aureus was isolated from milk sample taken from a makeshift stall selling snacks near OPD of the institute. Its colony count was 16.66 X 10^2 /ml.

Candida tropicalis was isolated from 1 milk sample, and its colony count was 1 X 10^4 CFU/ml. Thus, the inly pathogenic bacterium found in riuce samples was *E. coli* and only such pathogen from milk was *Staphylococcus aureus*.

DISCUSSION

This was one of our pilot studies to assess food safety in the eateries in and around the institute. Overall, it was found that the permanent eateries inside the campus sold much safer food as compared to those outside it, or even makeshift stalls inside the campus.

Food samples are a prime source of gastrointestinal infections, which can be invasive or toxin-mediated.[4] For example, contaminated milk and cheese is a major route of Staphylococcal food poisoning.[5]

CONCLUSION

Our study is the first such study from this area showing isolation of foodborne bacteria from food samples. More such pilot studies are required, especially from this area, keeping in mind the importance of food safety in preventing illnesses.

ACKNOWLEDGEMENTS

Authors sincerely acknowledge the help of Ravi Kumar, lab. attendant.

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