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ORIGINAL ARTICLE

Prevalence of *Salmonella* in finger swabs and nail cuts of hotel workers

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ABSTRACT

Objectives: Salmonella infections are usually acquired via the food chain as a result of the ability of *Salmonella* serovars to colonize and persist within the gastrointestinal tract of their host. Proper hygiene and enforcement of public health is the key to prevent Salmonella disease. This study was aimed to assess the finger swabs and nail cuts of hotel workers bacteriologically.

Materials and methods: In total various samples were collected from 40 hotel workers and processed to detect the Salmonella carrier. The finger swabs and nail cuts of hotel workers were collected and assessed bacteriologically for salmonella strains.

Results: A total of 35 finger swabs were bacteriologically assessed. Among 35 swabs 27 are male and eight are females. After conformation 23 samples (65.7%) showed positive to Salmonella. Also from a battery of 38 samples from nail cuts 30 (79.0%) showed positive to Salmonella.

Conclusion: The lack of public sanitary facilities can be another hurdle to keep the desirable hands hygiene of the vendors. In our study it is reported that severity of the current scenario among the hotel worker hygiene and they are the unknowingly playing role in spread of diseases like Salmonellosis. *J Microbiol Infect Dis 2012; 2(1): 1-4*

Key words: Salmonella, hotel workers, nail cuts and finger swabs

Otel çalışanlarının el sürüntüleri ve kesilmiş tırnaklarında *Salmonella* prevalansı

ÖZET

Amaç: Salmonella enfeksiyonları genellikle Salmonella serovarlarının gıdalarda kolonize olabilmesi nedeniyle alınır ve konak kişilerin gastrointestinal sistemlerinde varlıklarını sürdürürler. Uygun hijyen ve halk sağlığı düzenlemeleri salmonellaların oluşturduğu hastalıklarından korumada anahtar rolündedir. Bu çalışma otel çalışanlarının el sürüntüsü ve kesilmiş tırnaklarında bakteriyolojik araştırmayı hedefledi.

Gereç ve yöntem: Toplam olarak 40 otel çalışanından değişik örnekler toplandı ve *Salmonella* taşıyıcılığı açısından araştırıldı. Otel çalışanlarının el sürüntüsü ve kesilmiş tırnakları toplantı ve bakteriyolojik açıdan salmonella suşları için incelendi.

Bulgular: Toplam 35 el sürüntüsü bakteriyolojik olarak değerlendirildi. Bu 35 örnekten 27'si erkek sekizi kadınlara aitti. İncelemeler sonucunda 23 örnekten (% 65,7) *Salmonella* izole edildi. Aynı zamanda incelenen 38 kesilmiş tırnak örneğinden 30'unda (% 79,0) Salmonella izolasyonu yapıldı.

Sonuç: Toplumsal hijyen imkanlarının yeterli olmayışı satıcıların yeterince el hijyeni sağlamasında başka bir zorluğu teşkil etmektedir. Bizim çalışmamız otel çalışanları arasında hijyenin mevcut durumunun vahametini ve bunların salmonelloz benzeri hastalıkların yayılımında tanımlanmamış bir rol oynadıklarını gösterdi.

Anahtar kelimeler: Salmonella, otel çalışanları, kesilmiş tırnaklar ve el sürüntüleri

INTRODUCTION

As regards Salmonella, process hygiene criteria have been set down for carcasses and food safety criteria for a number of food categories including minced meat, meat preparations and certain meat products.[1,2] Most of the ~2,600 serovars of *Salmonella enterica* can infect a variety of animal species, leading to pathologies ranging from a self-resolving gastroenteritis to a life-threatening systemic infection, depending on the particular serovars-host interaction.[3] Food contamination with

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antibiotic-resistant bacteria can be a major threat to public health, and the resistance issue may be a challenging task in infection control.[4,5] The over crowed living conditions and inadequate hygiene facilities of the majority of these subjects results in poor sanitary conditions. Vendors of ready-to-eat food constitute a major source of food health risk, especially through fecal-oral transmission of pathogens, and vendor related risk is particularly high in poor resource communities.[6,7]

The World Health Organization estimates 16 million new cases and 600,000 deaths of typhoid fever were estimated each year.[8] The studies suggested that problem associated with safety of street foods are real and need to be addressed to protect consumers. The overcrowded living conditions and inadequate hygiene facilities of the majority of these subjects' results in poor sanitary conditions. These factors contribute toward outbreaks of salmonella infections.[9] Raw fruits and vegetables contaminated during slicing have been implicated in several food borne outbreaks, as have foods contaminated by food handlers who did not adhere to proper hygienic standards and practice proper hand washing techniques.[10]

In this study area there is no previous outbreak observed related to Salmonella infection among the hotel workers (Referred from Thanjavur District Municipality). In India, the working time for hotel workers is not determined properly due to the less salary packages, the hotel workers may continue the work even they have symptoms of Salmonella infection. According to the Salmonella carriers status this is the first work in this area on to check the carrier status among the hotel workers. The prone persons could be responsible for infection spreading.

The Salmonella bacilli are all pathogenic to greater or lesser degree. A wide variety of Salmonella serotypes are found in different geographical regions. Food handlers are cooks who become carriers are particularly dangerous. Carriers occur with Paratyphoid bacilli also. While *S. paratyphi A* occurs only in human beings, *S. paratyphi B* infects animals. The source of infection is a patient, or far more frequently, a carrier. Patients who continue to shed typhoid bacilli for three weeks to three months are called 'Convalescent carriers'. We focused mainly on hotel workers because it is the prone area of contamination of food. For this we collected nail cuts and finger scrapings from hotel workers.

MATERIALS AND METHODS

Sample Collection

The study setting was various hotels and road side restaurants in Thanjavur district in Tamilnadu, India. Samples were collected from total of 4 hotels and 7 road side open restaurants in Thanjavur in small wide mouthed sterile containers from the hotel workers. Before collection of the sample the surface was sterilized by distilled water for preventing the entry of contaminants. The collected samples are processed as soon as possible. Labeling plays a vital role, so the sterile containers should have appropriate label with name, date of collection and age.

Processing of finger swab

A total number of 35 finger swabs were collected and assessed bacteriologically. Sterile cotton swabs was prepared and dipped in saline and dispensed into screw cap tubes. Using the swab finger scrapings was collected from each hotel workers and it was aseptically swabbed on appropriate media like DCA, SS agar and Mac Conkey agar and kept it for incubation and colonies were observed after 2 to 3 days. From the colonies gram staining and motility test was prepared and observed. For further confirmation of Salmonella biochemical tests was performed.

Processing of nail cuts

A battery of 40 nail cuts from hotel workers were collected and processed bacteriologically. Nails of the hotel workers was cut with clean nail cutters and dispensed in screw cap tube containing peptone broth and it was kept for one day incubation. Sterile swabs were prepared and dipped in peptone broth and swabbed in appropriate selective media like SS, DCA and Mac Conkey agar. After 2-3 days colonies were observed. From the colonies gram staining and motility was performed.

RESULTS

No reports identified in this region regarding salmonella outbreaks carrier status, evaluation and antimicrobial assessment in case of hotel workers.

Finger swab assessment

The finger swab obtained from the hotel workers was initially dipped to the Stuart s medium and transferred to laboratory. A total of 35 finger swabs were bacteriologically assessed. After initial conformation the specimen were inoculated into DCA, SS and Mac Conkey agar for understanding the positivity of Salmonella carriers. Among 35 samples 23 showed positive and 12 showed negative to Salmonella.

Nail cut assessment

Among 40 nail cut samples from hotel workers only 38 samples were possible to process, where 2 were unable to process. Among 38 samples 30 showed positive to Salmonella and 8 showed negative to Salmonella. The details of Salmonella assessment among 38 nail cut samples The tables have many unnecessary details. You may erase two of tables and you may transfer the main data from these tables to the text. We do not need the results of chemical test for diagnosis. Give only main data such as the positive number of tests. Please provide the types of Salmonella strains if you have.

Among the 35 finger swabs predominant Salmonella were identified is *S. typhi* and same also observed that in nail cuts among the hotel workers. Out of 35 fingerswabs 23 supported *S. typhi* and 30 supported the same among nail cuts. Study indicates that 78.9% of the samples were positive.

DISCUSSION

Salmonella infections may spread from hotels and restaurants. Enteric fever was acquired by ingestion of faecally contaminated food or water. Enteric fever is endemic in all parts of India. Though there were no reliable information about its incidence in the country, typhoid fever has been estimated to affect 150-300 per 100,000-population. Food handlers in the affected community were instructed to have health check up at least once in a year, and they should be trained.[11] Mostly fresh fruits are being washed with un-chlorinated water and blended without proper cleaning.[12] Some of the investigation have been done in India in kerala region recently reporting the prevalence of Salmonella in eggs and their antibiotic resistance .50% eggs reported as a contaminated with different species of Salmonella.[16]

According to our reports the people those who croses the age 60 may have more salmonellae in their nail cuts and finger tips, thus showed that age related to immunocompromization takes place in more carrier outbreaks. The age incidence is related to the endemicity of the diseases and the level of sanitation. Egg packagers could expose to *S. enteritidis* infection during handling of contaminated egg shells via hand to mouth.

Repeated use of old carton for egg packages may be considered as sources of *S. enteritidis* contamination for Salmonella free eggs.[13] Salmonella can survive on the fingertips for at least three hours. Inoculum of less than 100 organisms per finger can lead to contamination of 90% of handled foods, which is sufficient to cause an explosive outbreak. When food is contaminated with fecal bacteria from hands, the contamination level is usually very low.[14] Several food products kept at room temperature were found to favor the growth of *Salmonella species*.

The spread of typhoid is associated with 20% of the newly identified carriers and also 9% previously identified carriers.[15] Hence the current study was suggested that most of the workers in hotel comes in contact with the food while serving, packaging, preparing, dispatching in case of restaurant, roadside hotels, food shops etc. may responsible for carrying the threat bugs in infected area. The present study was designed to assess the status of the infection carriers among the locality in case of commonly occurring infection and it was proved that the community itself spreading infection unknowingly among themselves. Though study reveals that outbreaks of Salmonella still the research among the community is at nascent stage and need to investigate by area wise different manner. Health authorities should must come forward to aware and prevent infection spread by regularly health checkup of workers who are direct and indirect in contact with the community and responsible for Diseases.

Our study was designed to confirm the hypothesis ‘Prevalence of salmonella among hotel workers’ at a certain district level and was proved. It is really need of an hour to design such works to control and aware public to control infection especially in case of India. Source of support: None

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