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Prevalence of bacterial infections among food-handling workers in 1st district of Kirkuk city

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Abstract

Objective: To determine the prevalence of bacterial infections among food-handling workers in Kirkuk City using throat swab culture and Widal test screening.

Methods: A cross-sectional study was conducted among 15052 food-handling workers. A throat swab culture were used for bacterial pathogens, and Widal tests were used as a serologic screen for Salmonella infection.

Results: A total of 993 (6.597%) throat swabs were positive for bacterial pathogens, and 681 (4.524%) were positive for Widal test.

Conclusion: The findings indicate significant bacterial throat colonization and notable Salmonella seropositivity among workers. Regular medical screening and continuous hygiene education are recommended for prevention of foodborne infections transmission.

Keywords: Bacterial infections, Food-handling workers, Throat swab culture, Widal test, *Salmonella* infection, Kirkuk City, Prevalence study, Public health surveillance

1. Introduction

Food-handling workers can be a reservoirs for bacterial pathogens, transmitting infections to consumers through direct or indirect contamination of food [1]. The role of asymptomatic carriers in spreading *Staphylococcus aureus*, *Streptococcus pyogenes*, and *Salmonella* is well-documented [2, 3]. Routine examination helps detect carriers early, allowing intervention before foodborne outbreaks occur [4]. The aims of this study are to determine the prevalence of bacterial throat infections and *Salmonella* seropositivity using the Widal test among food-handling workers in Kirkuk City, Iraq.

Methods

Study Design: A cross-sectional descriptive study was conducted on a sample of food-handling workers registered in Kirkuk City.

Sample Collection and Laboratory Analysis: Throat swabs were collected using sterile swabs and cultured on blood and MacConkey agar. Organisms were identified through standard biochemical tests. Widal test was performed using agglutination method for detection of *Salmonella typhi* and *S. paratyphi* antibodies. Titers above the diagnostic threshold were considered positive [5].

Data Analysis

Prevalence (%) = (Number of positive cases ÷ Total tested) × 100. Confidence intervals (95% CI) were estimated using the standard normal approximation.

Results

Table 1: Prevalence of bacterial and *Salmonella* infections among food-handling workers in the 1st district of Kirkuk City

Test	Positive (n)	Negative (n)	Total tested (n)	Prevalence (%)	95% CI (%)
Throat swab (bacterial)	993	14059	15052	6.597	6.201 - 6.994
Widal test (<i>Salmonella</i>)	681	14371	15052	4.524	4.192 - 4.856

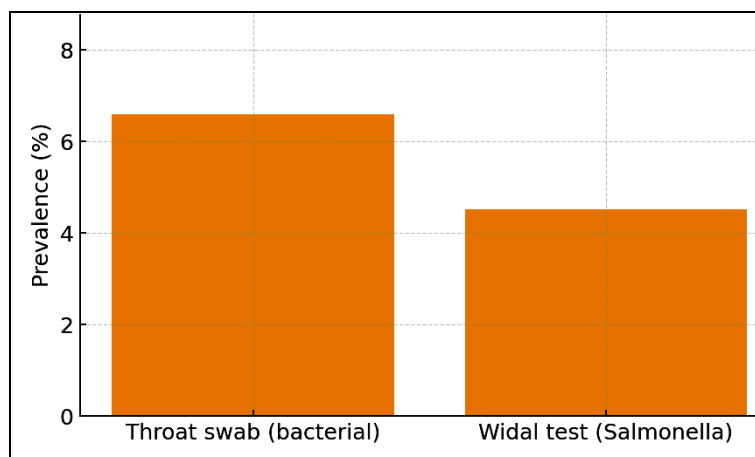


Fig 1: Prevalence of bacterial throat infection and Widal positivity among food handlers in Kirkuk City.

Discussion

This study revealed a 6.597% prevalence of bacterial throat infections among food handlers and a 4.524% Widal positivity. High carriage rates may contribute to increased risk of food contamination, particularly where hygiene practices are suboptimal. Comparisons with regional studies indicate variable carriage rates; differences may reflect sampling methods, lab protocols, and local epidemiology^[6, 7]. Widal positive results are indicative of exposure but require culture confirmation due to limited specificity^[8, 9].

Conclusion

Bacterial throat carriage: 6.597% among screened workers.
Widal seropositivity: 4.524%.

Routine medical screening, proper hygiene practices, and confirmatory testing for Widal-positive individuals are recommended.

Recommendations

Regular bacteriological screening for all food handlers before and during employment.

Health education programs focusing on hand hygiene and safe food handling.

Exclusion and treatment of workers found to be carriers before returning to work.

Further studies on antimicrobial resistance patterns of isolated bacteria.

Continuous monitoring and updating of food safety regulations by health authorities.

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