

Isolation of *Salmonella enterica* serovar typhi from breast abscess: A rare extra-intestinal presentation

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ABSTRACT

Extra-intestinal infections caused by *Salmonella enterica* serovar Typhi are not very common among individuals with the healthy immune system. Breast abscess caused by *Salmonella* Typhi is a rare clinical presentation, especially in non-lactating pregnant females. We are reporting case of a 28-year pregnant female (G4P3) presented with a unilateral breast abscess. She had no significant medical history or any such complains previously. Incision and drainage under aseptic measures was performed, aspirated pus from the breast was sent for culture and sensitivity to the microbiology department. Isolated colonies were non-lactose fermenting, which were biochemically suggestive of *Salmonella* species. *Salmonella enterica* serovar Typhi was finally identified using API 10S as well as VITEK 2 automated system. The patient showed rapid recovery after surgical and medical management and was discharged. This case shows a rare form of extra-intestinal manifestations of *Salmonella Typhi* and draws attention for considering *Salmonella Typhi* as a potential etiological agent of breast abscess in pregnant patients who is from region where typhoid is endemic.

Keywords: Breast abscess, Extra-intestinal salmonellosis, *Salmonella enterica* serovar Typhi, Typhoid fever.

BACKGROUND

Salmonella are ubiquitous, non-spore forming facultative anaerobic Gram-negative rods belonging to Enterobacterales with over 2600 serovar causing illnesses including enteric fever, gastroenteritis, bacteremia, localized infections, and chronic carrier states.¹ Of these serovars, *Salmonella enterica* serovar Typhi is commonly implicated in enteric fever, a systemic febrile disease. These serovars are categorized as typhoidal or non-typhoidal. Human are the only reservoir for Typhoidal serovars are transmitted by person to person contact, causing typhoid. Untreated or inadequately treated infections, particularly those exhibiting antimicrobial resistance, can result in the dissemination of *Salmonella* to diverse organ systems, leading to complications. Globally, *Salmonella* is responsible for an estimated 90 million cases of gastroenteritis annually, leading to approximately 155,000 deaths.²

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CASE REPORT

A 28-years pregnant female, (G4P3), presented to outpatient surgical department Pak-Emirates Military Hospital Rawalpindi. She had complaint of localized breast discomfort and heaviness for one week. No history of trauma, chronic illness. There was no significant past surgical history. She was non-diabetic and non-hypertensive. On examination the lump was soft, tender and warm without any sinus or discharge from nipple. Non-tender and non-palpable lymph nodes. Ultrasound revealed, a localized collection of 2-3 ml of pus in the breast. Patient was 25 weeks pregnant and non-lactating when she was admitted.

Pus drained after incision and drainage from the abscess was sent for culture and sensitivity. Paired blood cultures along with routine base line investigations were carried out of which TLC was $25.5 \times 10^9/L$. Direct Gram staining was performed (Figure-1).

The specimen was processed following standard microbiology guidelines. Overnight incubation revealed a non-lactose fermenting oxidase negative organism. Based on colony morphology and serology *Salmonella Typhi* was finally identified.

API 10S (BioMerieux, France) along with Vitek 2 automated system were used for further confirmation. Sensitivity was applied according to CLSI 2025 by modified Kirby-bauer disc diffusion method.³ The isolate was sensitive to Ampicillin, Chloramphenicol, Co-trimoxazole, Ceftriaxone, Meropenem and Azithromycin whereas isolate was resistant to

Ciprofloxacin. Based on final identification and sensitivity, injection ceftriaxone was given 1gm intravenous twice daily for one week. Blood cultures were reported negative after 7 days of incubation. No workup for immunocompromised state was carried out. Patient responded well with complete resolution of symptoms and discharged after one week.

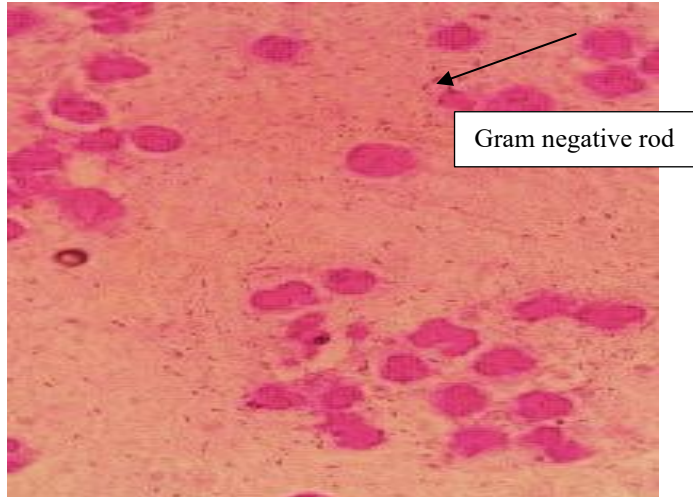


Figure-I: Direct Gram stain of specimen showing Gram negative rods and numerous pus cells.

DISCUSSION

Salmonella species are responsible for a wide spectrum of human diseases, including gastroenteritis, septicaemia, enteric fever, and focal extra-intestinal infections.⁴ The development of extra-intestinal complications in typhoid fever is influenced by several factors, including bacterial load, virulence of the strain, host immune status, prior antimicrobial exposure, and treatment failure.⁵ Conditions such as extremes of age, immunosuppression, underlying malignancy, diabetes mellitus, intravenous drug use, and trauma have been identified as predisposing factors for focal *Salmonella* infections.

Salmonella enterica serovar Typhi is the main cause of enteric fever, but its presentation as a localized breast abscess is rare.⁶ Extra-intestinal spread of salmonellosis is due to hematogenous dissemination during a transient bacteremia.⁷

Localized infections caused by *Salmonella* are more common in immunocompromised individuals, those with extremes of age, malignancy, diabetes mellitus, and pregnancy. In pregnancy cell-mediated immunity is altered,

which maybe one of the cause of invasive and atypical infections, with no presence of gastrointestinal symptoms.⁸ Mostly reported breast abscesses are due to *Salmonella Typhi*, disseminated infections have also been caused by *Salmonella paratyphi* and *Salmonella Typhimurium*. Siddesh and Sumana reported a case of breast abscess due to *Salmonella Paratyphi* in a febrile young female.⁹ Notably, the majority of these patients were non-lactating and non-pregnant, making the present case particularly unusual.

Given that typhoid fever remains endemic in Pakistan, clinicians should remain vigilant for atypical and extra-intestinal manifestations of *Salmonella Typhi*. Early recognition, appropriate microbiological investigation, and timely surgical and medical management are essential to prevent complications, particularly in vulnerable populations such as pregnant women.¹⁰

Breast abscess due to *Salmonella Typhi* has been reported infrequently in the literature, mostly in non-lactating females, and is often diagnosed only after culture of aspirated pus, as blood cultures may remain negative this study goes parallel to ours.¹¹ In the areas where typhoid is endemic such as Pakistan, clinicians should have high suspicion for *Salmonella* species when encounter unusual presentations of breast abscess, particularly in pregnant female.¹² The most probable cause of localized abscess in our case is that she may had developed transient bacteremia in past. In pregnancy weakened immune system caused the organisms to restrict themselves in breast leading to the formation abscess.

CONCLUSION

In typhoid- endemic regions, *Salmonella* should be considered a potential agent causing breast abscesses without typical presentation. Such cases can be early detected treated and reduce complications by accurate microbiological workup, timely surgical intervention, and targeted antimicrobial therapy.

CONFLICT OF INTEREST

None

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Declared none

AUTHOR CONTRIBUTION

Sidra Naveed: Substantial contributions to study design, acquisition of data, manuscript drafting or reviewing it critical for important intellectual Content 3. has given final approval of the version to be published

Luqman Satti: Substantial contributions to concept, study design, manuscript drafting or reviewing it critical for important intellectual content, has given final approval of the version to be published

Warda Furqan: Critical review, has given final approval of the version to be published, substantial contributions to analysis and interpretation of data, has given final approval of the version to be published

Afnan Naeem: Critical review, has given final approval of the version to be published, substantial contributions to analysis and interpretation of data, has given final approval of the version to be published

Inam Ullah Khan: Has given final approval of the version to be published, substantial contributions to analysis and interpretation of data, manuscript drafting or reviewing it critical for important intellectual content, critical review, has given final approval of the version to be published

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