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# Detection of Extended-Spectrum ß-Lactamases (ESBLs), TEM, SHV and CTX-M genes among *Staphylococcus haemolyticus* isolates from cesarean section infections Basrah Government, Iraq

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SUMMARY

**AUTHORS' CONTRIBUTION: (A)** Study Design · **(B)** Data Collection . **(C)** Statistical Analysis · **(D)** Data Interpretation · **(E)** Manuscript Preparation · **(F)** Literature Search · **(G)** No Fund Collection

Background: Cesarean section it regarded crucial risk factor for postpartum inflammatory because of uterine skin rapture, bladder catheterization, and endometritis. The S. haemolyticus is the second most recurrently pathogenic of clinical nosocomial infections, especially with sepsis, on skin and soft tissue infections mainly existing as abscess, paronychia, and serious infections in different the body systems.

Methods: One hundred and fifty swab samples were collected from women who had caesarean sections at Al-Basrah Teaching Hospital between October 2022 to January 2023. The Vitek®2 system test revealed for identify positive bacterial growth. Then double Disk Approximation Method (DAM) was used to tested S. haemolyticus isolates for produce Extended Spectrum β-Lactamase (ESBLs). For the β-lactamase gene amplification, three specific primers were employed: blaTEM, blaSHV and blaCTX-M genes.

Results: From October 2022 to January 2023, 150 swab samples were collected. The samples showed 57 (38%) positive bacterial growth, distributed 51(89. 5%) Gram-positive bacterial isolates, while 6(10. 5%) Gram-negative bacterial isolates, by Using the Vitek® 2 system, various bacterial species were identified, *Staphylococcus haemolyticus* the most predominant. Out of 34 isolates, 31 (91. 2%) were divided *S. haemolyticus* 39 (68. 42%) isolates, *Staphylococcus aureus* 6(10. 53%), *Klebsiella* spp. 4(7. 00%) isolates, *Staphylococcus saprophyticus* 3 (5. 30%) isolates, Escherichia coli 2 (3. 50%) isolates, *Staphylococcus sciuri* 1(1. 75%. ) isolate, *Staphylococcus hominis* 1(1. 75%) isolate, and *Enterococcus faecium* 1 (1. 75%) isolate. Out of (n=34) isolates that distributed to 31 (91. 2%) isolates were divided into S. haemolyticus 25 (74%), and S. aureus 6 (18%) isolates were gave positive results for producing extended-spectrum ß-lactamases (ESBLs). While, 3(8. 8%), isolates of *S. haemolyticus* were shown negative results for producing ESBLs by using of the double approximation method (DAM) The results of the current study revealed from (n=34) *Staphylococci* spp. were distributed to 28 (82%) *S. haemolyticus* and 6(18%), that 33(97. 1%) *Staphylococcus* spp. isolates gave positive results for the detection of TEM and SHV gene. While the 1(2. 9%) isolate was shown negative result for the detection of TEM, SHV and CTX-M genes. While in the present study the results showed that all 34 (100%) *Staphylococcus* spp. were gave positive results for detection of the CTX-M gene

Conclusion: The most isolates of *S. haemolyticus* and *S. aureus* were multi drug-resistant (MDR) were detected by using Vitek®2 compact system and most isolates of *S. haemolyticus* and *S. aureus* were producing extended-spectrum ß – lactamases(ESBLs).

Keywords: Cesarean section infections; *Staphylococcus haemolyticus; ESBLs; TEM; SHV; CTX-M genes*

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## INTRODUCTION

Cesarean section it regarded crucial risk factor for postpartum inflammatory because of uterine skin rapture, bladder catheterization, and endometritis [1,2]. The inappropriate antimicrobial agent, or prolonged used the antibiotics may lead to bacterial resistance and increased SSI rates [3,4]. *S. haemolyticus* it is considered one of the predominantly Coagulase Negative *staphylococci* (CONS). *S. haemolyticus* is non-motile, non-sporulation, Gram-positive and facultative anaerobic. However, the *S. haemolyticus* can be growth in optimal temperature between 30-40 °C with the presence of $O_2$ and 10% of NaCl [5]. *S. haemolyticus* regard as inhabitants of the human and animal microorganisms, has been many reports as a relationship with nosocomial pathogens because biodiversity of microbial and virulence apparatus including resistance to antibiotics [6-8].

The *S. haemolytics* is the second most recurrently pathogenic of clinical nosocomial infections, especially blood cultures of patients with sepsis, on skin and soft tissue infections mainly existing as abscess, paronychia, and serious infections in different the body systems involving endocarditis, meningitis, joint prosthetic infections, peritonitis, otitis media, urinary tract infections, septicemia and it is widespread in the hospital situation also on the hands of workers in the health care [9,10]. Furthermore, the increased of infectious associated with medical implanted and devices were caused by the pathogen interpreting Multi-Drug Resistant (MDR) Profiles [11,12]. Detect of ESBLs-producing organisms is critical for infection control and nosocomial outbreak prevention. The purpose of this study was detect Extended-Spectrum ß-Lactamases (ESBLs) genes *TEM*, *SHV* and *CTX-M* genes in *S. haemolyticus* isolates from cesarean section infections from Al-Basrah governorate, Iraq.

## MATERIALS AND METHODS

### Collection of specimens

One hundred and fifty swab samples were collected from women underwent cesarean section for both emergency cesarean delivery, and elective cesarean delivery during period from Oct. 2022 to Jan. 2023 in Al-Basrah Teaching Hospital were selected depending on their medical history.