The prevalence and antibiotic resistance *methicillin-resistant Staphylococcus aureus* (MRSA) recovered from adult Urinary tract infections in Zakho City, Kurdistan-Iraq

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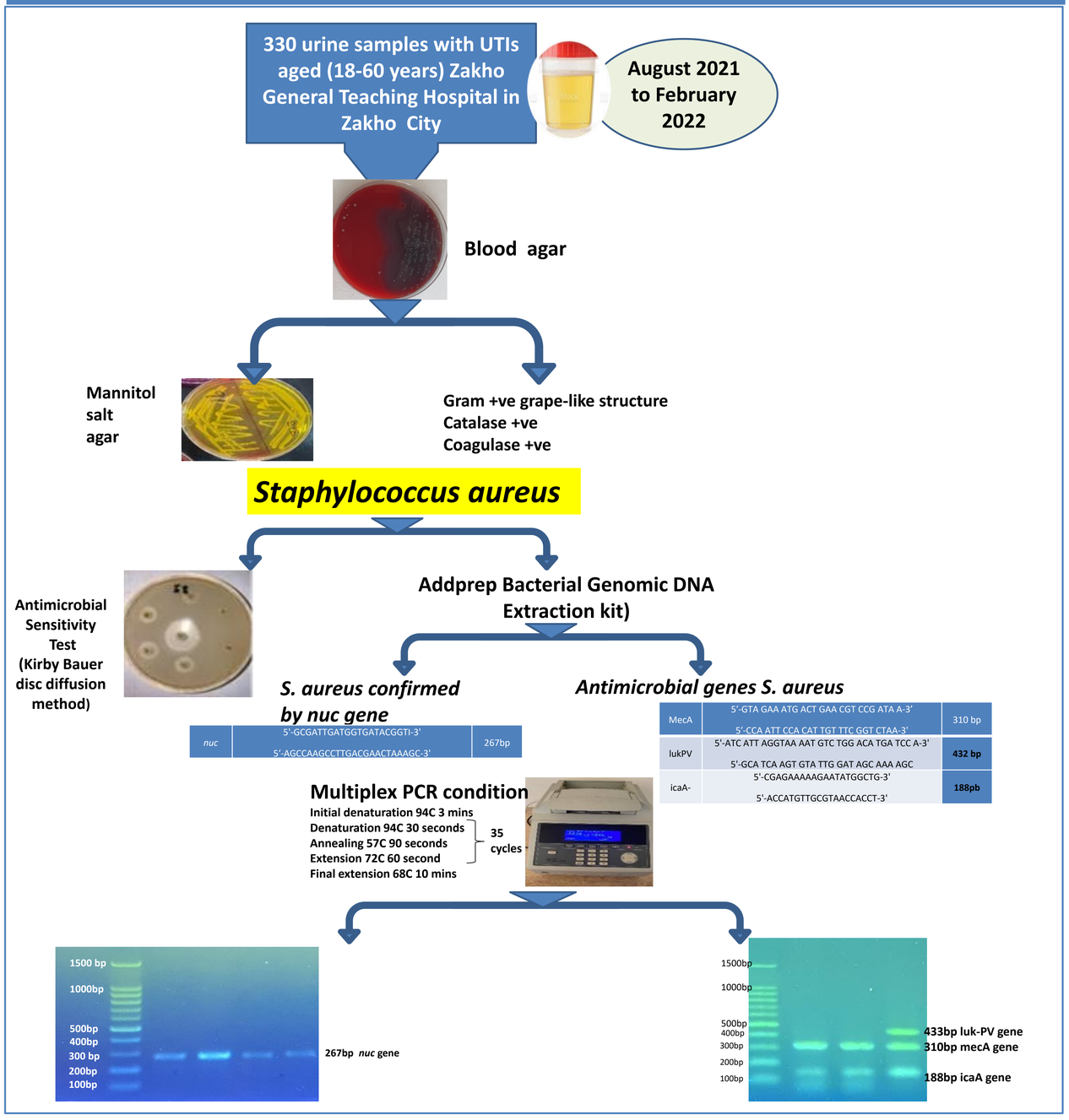
antibiotics

Introduction

Urinary tract infections (UTIs) are one of the most common bacterial infections in outpatients adults (1,2). The prevalence and emergence of methicillin-resistant Staphylococcus aureus (MRSA) among adult outpatients urinary tract pathogens has been reported (1,2).

Aims: this study is undertaken to study the prevalence of MRSA, phylogenetics and molecular diagnosis, along with their antimicrobial susceptibility pattern among out-patients adults diagnosed with UTIs in Zakho city, Kurdistan-Iraq.

Methods



Roughly all *S. aureus* were resistant to both ampicillin and erythromycin and approximately 90% of them were resistant to methicillin and cefotaxime. Additionally, around 85% of *S. aureus* were resistant to vancomycin, cloxacillin, and tetracycline whereas around ¾ were resistant to trimethoprim and oxacillin. In contrast, imipenem is considered highly sensitive to *S. aureus.*

Examples for PCR products of some extracted DNA of *S. aureus* have *mecA, luk-PV and icaA genes* (Fig 2b). Fig 2c shows all isolated *S. aureus* was possess both have *nuc* and *mecA* genes while 9 and 7 of them have non *luk-PV* and *icaA* genes, respectively.

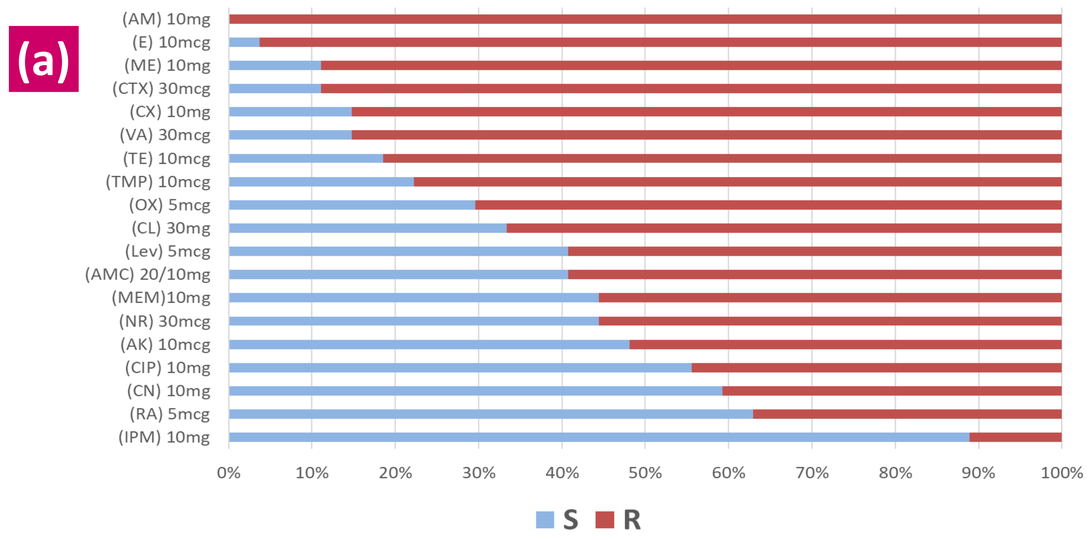


Figure 2: The proportion of S. aureus antimicrobial susceptibility pattern in adults with UTIs (a), Agarose gel electrophoresis of Multiplex PCR reaction for *mecA, luk-PV and icaA of* S. aureus isolates DNA (b) and the number of presence and absent of these genes (c).

Results

A total number of 330 UTIs attended to clinic aged >18 years and from these, 27 *S. aureus* isolates were recovered and from these patients 25 were married and had chronic UITs condition. The number of UTIs infected females (81%) with *S.aureus* was significantly counterpart as compared male (Fig 1a). All these bacteria have molecularly confirmed by *nuc* genes and an example for 16 samples as shown in (Fig 1b).

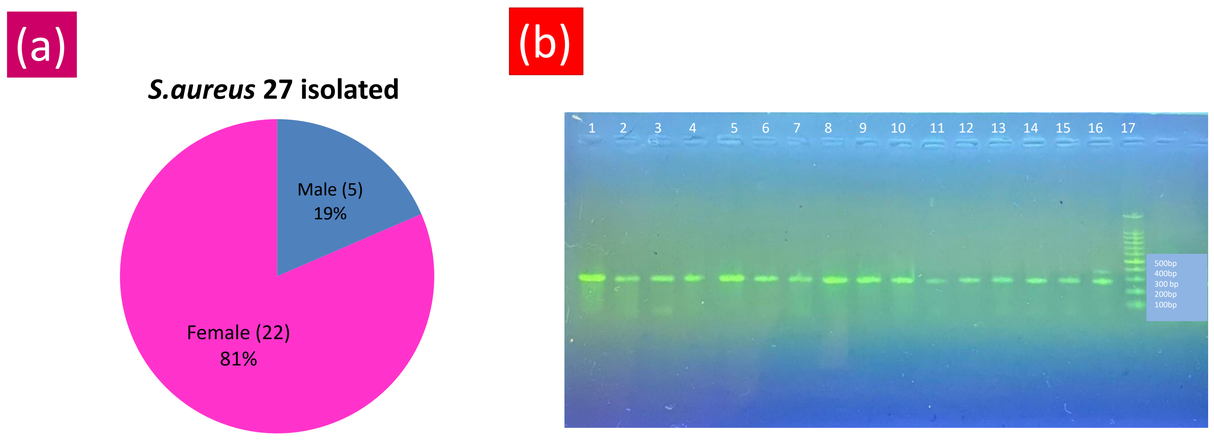


Figure 1: The number and proportion of UTIs in adults in both gender (a). Agarose gel electrophoresis of PCR reaction for *nuc* gene products for isolated *S. aureus* isolates DNA. Lanes (1-16) isolates and Lane (17) 100bp DNA marker, Lanes (b).

Discussion

It is not surprising that females with UTIs are much higher than males and this is due to differences in the anatomical structure of the urogenital system (3,4). Several studies in Iraq particularly Kurdistan region reported that *S.aureus* are the main gram positive bacteria infected adults UTIs and they did not molecularly reported them (5). In this study, almost all *S.aureus* UTIs among married and chronic UTIs, and this is in agreement with previous studies speculates that the high incidence of *S. aureus* occur particularly in high sexually active and child-bearing age group as well with chronic cases (4). Although all *S.aureus* are not all resistant to antibiotics such as methicillin, vancomycin and oxacillin, all these isolated DNA have *mecA* gene. Thus, the molecular diagnosis for the antimicrobial resistant is more accurate than the Antimicrobial Sensitivity Test. The prevalence of MRSA strains obtained from UTIs in this study were highly 100%. MARSA is considered highly sensitive to imipenem.

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