

Short communication***Staphylococcus aureus* Screening: Surveillance Data of Five Years**Ayşe I. Tosun^{1*}, Özlem Güven¹, Canan Sever²¹Department of Medical Microbiology, Istanbul Medipol University, 34214 Istanbul, Turkey²Department of Infectious Diseases, Istanbul Medipol University, 34214 Istanbul, Turkey**Abstract**

The aim of the study is to investigate the status of nasal MRSA colonization in patients admitted to Istanbul Medipol University Hospital over a 5-year period. The MRSA nasal carriage prevalence was found to be 5.32%. The results indicate that there was an increase in 2014 and 2015 but since then there has been a steady decrease.

Keywords: *Staphylococcus aureus*, methicillin-resistant *S. aureus* (MRSA), surveillance data

Резюме

Целта на изследването е да се установи колонизацията на назалните метицилин-резистентни представители на *Staphylococcus aureus* (MRSA) при пациенти, приети в университетската болница «Медипол» в продължение на 5 години. Резултатите показват, че назалните носители на MRSA са 5.32%. Тези данни очертават тенденция на увеличение през 2014 и 2015 г., но след това се наблюдава постоянен спад.

Introduction

Methicillin-resistant *Staphylococcus aureus* (MRSA) carriage has been determined as a risk factor for endogenous infections. MRSA has been an important health issue as being a common nosocomial agent world-wide. Determination of nasal MRSA carriage is considered as helpful for prevention of resistant-bacterial dissemination and the management of patients with higher risk of infection (Glick *et al.*, 2014; Stenehjem *et al.*, 2013).

Material and Methods

A retrospective surveillance study was conducted at Istanbul Medipol University Hospital between July 2012 and August 2017. We collected culture data of *Staphylococcus aureus* colonization of anterior nares in patients. The specimens were obtained within 24 hours of admission of patients to our hospital. All specimens were inoculated using Blood Agar (Beckton Dickinson, USA). After 24 hours beta hemolysed suspicious colonies were identified with coagulase test (Staphylase Test, Oxoid, UK). For all *Staphylococcus aureus* strains

were tested for oxacillin sensitivity with Kirby-Bauer disc diffusion method. Evaluation was based on CLSI (M100 S-24, M100 S-26) criteria.

Results

During the 5 years period a total of 8453 patients were screened for nasal *S. aureus* colonization. Of these 18.31% (1548) were culture positive with *S. aureus*. The prevalence of MRSA colonization was found to be 5.32% (450) among patients. MRSA rates in respect to different years are shown in Fig. 1. The isolation rates of methicillin-resistant and susceptible *S. aureus* strains of all culture positive samples during the surveillance period is given in Fig. 2.

Conclusions

The MRSA nasal carriage prevalence was found to be 5.32% in 5 years period. There was an increase in the rates of isolation MRSA in 2014 and 2015 but since then there has been a steady decrease. The surveillance of MRSA allows implementation of appropriate infection prevention and control policies.

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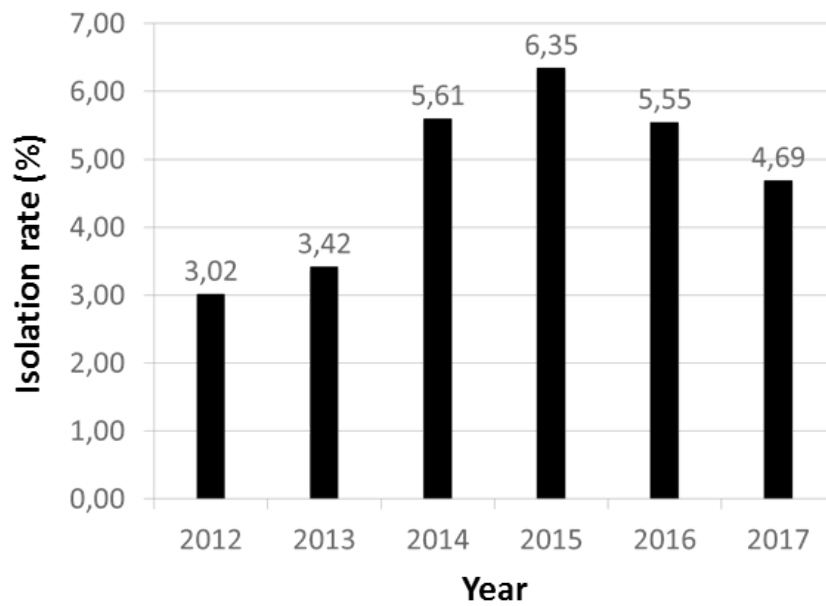


Fig. 1. MRSA positivity rates over years

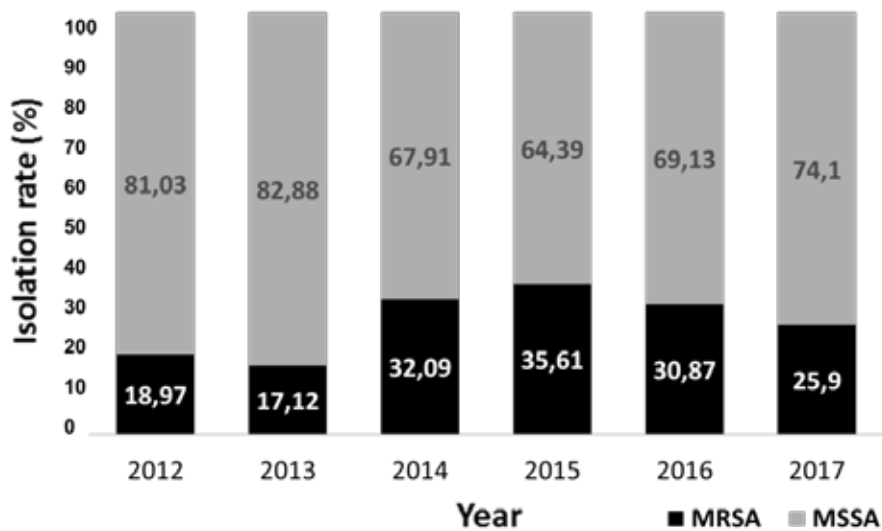


Fig. 2. MRSA and MSSA rates over years

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Letter to the Editor

The Possible Effects of IL-1 β , IL-6 and TNF- α on Growth Rate in Two Different UPEC Strains

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Host factors (hormones, indole, bile salts, vitamins) are known to affect bacterial growth rates, antibiotic susceptibility and various gene expressions (Plotkin *et al.*, 2000; Hirakawa *et al.*, 2005; Clark and Soory, 2006; Freestone *et al.*, 2007; Hamner *et al.*, 2013). During inflammation, cytokines as one of these host factors, act as leader of an orchestra to remove infection. Cytokines are involved in the systemic and local inflammatory response in patients with UTI (Meduri, 1996; Feghali and Wright, 1997). Tumor necrosis factor- α (TNF- α), interleukin-1 β (IL-1 β) and interleukin-6 (IL-6) are the most efficient pro-inflammatory cytokines in patients with urinary tract infections especially during pyelonephritis (Otto *et al.*, 1999; Mohkam *et al.*, 2009; Gokce *et al.*, 2010). In previous studies, it has been shown that the levels of these cytokines in blood and urine are significantly higher in patients with acute pyelonephritis compared to patients with lower UTI (Olszyna *et al.*, 1998; Otto *et al.*, 1999; Mohkam *et al.*, 2009; Gokce *et al.*, 2010). In our study, we aimed to investigate the effects of IL-1 β , IL-6 and TNF- α on the growth rate of two different UPEC strains isolated from patients with cystitis and pyelonephritis.

Two UPEC strains carrying different genes (*cnf*, *sfa/foc*, *iroN*, *ompT*, *usp* and *sfa/foc*, *iroN*, *ompT*, *usp*) were tested to determine the alterations on growth rate. These strains were isolated in our previous study (Uzun *et al.*, 2015).

Strains were grown in Roswell Park Memorial Institute Medium (RPMI) (control) and RPMI containing IL-1 β , IL-6 and TNF- α (10, 100, 1000 and

10.000 pg/mL), which were determined according to their physiological and inflammation levels of blood in humans. We chose RPMI medium because it lacks the complex organic materials that are present in a conventional bacteriologic growth medium, and has no interference with the biologic activities of the tested cytokines (Umberto *et al.*, 1999)

All strains were inoculated into 13 different experimental conditions to an initial turbidity of 10⁷CFU/mL. Organisms were incubated at 37°C. Growth rates were determined by the measurement of changes in absorbance at 600 nm in 4, 6 and 24 –hour periods.

Each assay was performed in duplicate and the results were expressed as the mean of three independent experiments. Growth rates were determined via optical density measurement by a spectrophotometer. Statistical analysis was conducted by two-way ANOVA and Bonferroni post analysis.

Statistical analysis showed no significant difference ($p>0.05$) between the growth rates in RPMI and RPMI with different concentration of cytokines (Figure). Although some studies have reported that prokaryotic cells may use cytokines as growth factors, in our study no differences were detected in the growth of the two UPEC strains in the presence or absence of cytokines. Therefore, we thought that the alteration of growth rate in the presence of different host factors can be variable depending on the characteristics of the strain tested.

This graph shows the growth kinetics of a cystitis isolate with the presence of TNF- α , which shows that the growth rates were found to be statistically not significant. The same results were detected with the presence of IL-1 β , IL-6 in a cystitis

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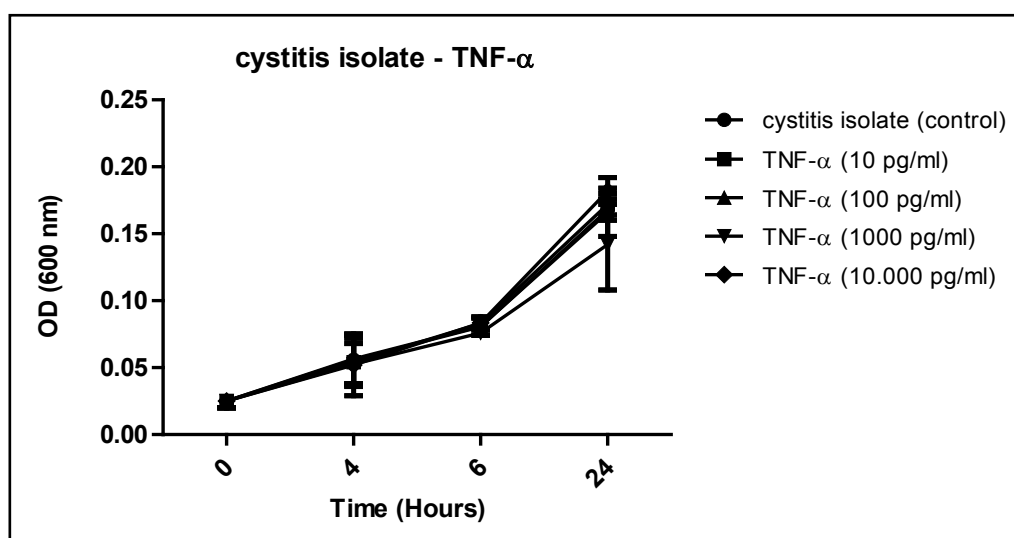


Fig. 1. Effect of different TNF- α concentrations on growth rate in cystitis isolate.

strain. The growth rates of a pyelonephritis strain treated with three different cytokines were found to be the same.

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