



## Fusidic acid resistance in *Staphylococcus aureus* in patients with Head and neck space infections

## KEYWORDS

*Staphylococcus aureus*, Fusidic acid, India

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## ABSTRACT

The prevalence of resistance of *Staphylococcus aureus* to fusidic acid is gradually increasing. However, there is less data regarding the prevalence in clinical strains isolated from deep seated infection. This study found only one MRSA isolate from patient with head and neck space infections exhibiting high level resistance to fusidic acid, however all the MSSA isolates were uniformly sensitive. The susceptibility should be monitored as fusidic acid in combination regimen, might serve as an effective oral alternative to oxazolidinones in multidrug resistance *S aureus*.

## Introduction:

Head and Neck space infections are potentially lethal infections<sup>1</sup> though the incidence is decreasing these days due to the advent of antibiotics and improved oral hygiene and dental care in the recent world<sup>2</sup>. *Staphylococcus aureus* still remained one of the most common bacterial etiology. In the Indian context, very few studies appeared to have been conducted on the incidence of Methicillin Resistant *S aureus* (MRSA) in head and neck space infections. Fusidic acid is an oral antimicrobial agent if used in combination, effective against *S. aureus*<sup>3</sup>. The problem of resistance to fusidic acid is not reported to be very high in Indian scenario<sup>4,5</sup>. The aim of this study was to investigate the presence of fusidic acid resistance among *S. aureus* from clinical isolates from North India.

## MATERIALS AND METHODS

A total of 26 *S aureus* were isolated from pus samples of patients with head and neck space infections, which are identified by conventional methods<sup>6,7</sup>. Methicillin resistance was screened both by Oxacillin Agar Screening<sup>8</sup> and Cefoxitin Disc Method<sup>8</sup>. ATCC 25923 was also put up side by side. Antimicrobial susceptibility against fusidic acid was done by both disc diffusion and E-test. Interpretation of the results was done in accordance with standard literatures<sup>9,10</sup>.

## OBSERVATIONS

Of the 26 isolates of *S aureus* obtained, 3 (11.5%) strains were identified as Methicillin Resistant *S aureus*. Salient features of the 03 MRSA isolates are depicted in table 1.

**Table 1: Salient features of the three patients from whom MRSA strains**

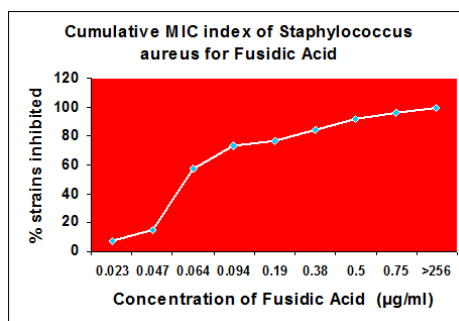
Sl No.	Age / Sex	Space involved	Etiology	Clinical presentation	Organism isolated
1	49 year/ F	Submandibular	Dental infection	Swelling, odynophagia, Trismus	<i>Staphylococcus aureus</i>
2	40 year/ M	Peritonsillar	URTI	Fever, sore throat, odynophagia, neck pain	<i>Staphylococcus aureus</i> + $\beta$ -haemolytic Streptococcus
3	12 year/ F	Submental	Unknown	Fever	<i>Staphylococcus aureus</i> + $\beta$ -haemolytic Streptococcus

All 26 isolates were found to be sensitive to fusidic acid (10 $\mu$ g) by disc diffusion method<sup>11</sup>. The MIC ranges, MIC<sub>50</sub> and MIC<sub>90</sub> values of the isolates of *S aureus* (MSSA and MRSA) to fusidic acid are shown in Table 2.

**Table 2: MICs of MSSA and MRSA strains**

Strain	$\mu$ g/ml		
	MIC Range	MIC <sub>50</sub>	MIC <sub>90</sub>
MSSA	0.023 – 0.75	0.064	0.50
MRSA	0.064 - >256	0.064	>256

**Figure 1**



MIC interpretation<sup>11</sup> showed all the MSSA isolates to be sensitive to fusidic acid. However, 01 MRSA isolate showed high level resistance of >256  $\mu$ g/ml. The cumulative MIC index is depicted in Figure 1.

## DISCUSSION

Fusidic acid is not a new antimicrobial agent and has been in clinical use since 1962. In the Indian scenario, however it is used primarily in dermatological practice. We observed all strains to be sensitive to fusidic acid by the disc diffusion method. However, determination of MIC by the E-Test showed that one strain (3.8%) of *S aureus* to be resistant to fusidic acid. This was incidentally a strain of MRSA showing an MIC value of >256  $\mu$ g/ml. Ayliffe et al also observed high resistant level to this antibiotic in a few centers in his series<sup>12</sup>. All the isolates of *S aureus* were found to be sensitive to fusidic acid with MIC<sub>50</sub> of 0.023 and MIC<sub>90</sub> of 0.047 in a study from New delhi<sup>1</sup>. However, 2.63% of CAMRSA strains were found to be resistant to fusidic acid in Sikkim<sup>5</sup>. Our results on the high MIC of the MRSA isolate is in accordance with the studies.

## Conclusion:

Neither MRSA nor fusidic acid resistance are a significant problem in head and neck infections till now. However, due to heavy use in dermatology as monotherapy, there is risk of increasing resistance to fusidic acid. Oral fusidic acid can serve as a potential component of a combination therapy against MRSA before choosing a oxazolidinone.

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