



Evaluation of fusidic acid susceptibilities of *Staphylococcus aureus* strains

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OBJECTIVES

Decreased susceptibility and resistance to fusidic acid (FA) is in an increasing trend. Although FA has been in clinical use for decades, any information was not reported in CLSI yet, and those recommended by other societies are in routine use. We aimed to determine FA susceptibility rates of *S.aureus* strains recovered from various specimens, and compare the rates according to guidelines, Comité de L'antibiogramme de la Societe Française de Microbiologie (FSM) and European Committee on Antimicrobial Susceptibility Testing (EUCAST).

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METHODS

In vitro activity of FA against 732 *S.aureus* was evaluated using Kirby-Bauer disk diffusion (DD) test method using zone breakpoint interpretations of FSM and EUCAST. Additionally, correlation between DD test and MIC test detected by E-test for FA were analysed in a selected group of strain (n=64).

RESULTS

Of the 732 *S.aureus* 69 (9.4%) were resistant to FA by the proposed zone diameter breakpoints of FSM and EUCAST. Only four discrepant results were detected by DD and E-test. Of the 13 strains susceptible with E-test, three were resistant with DD method. Overall the agreement of E-test and DD were 93.7%. According to the EUCAST/FSM 23 (6.4%) community and 46 (12.4%) nosocomial strains were resistant to FA (OR=2.09;95%CI=1.24-3.53;p=0.005). Additionally, higher resistance rates for FA were detected among MRSA compared to MSSA; 21.2% v 7.2%, respectively (p= 0.001). Of the 64 *S.aureus* isolates tested with FA E-test, 28 (43.8%) were MRSA. MICs of the strains were ranging between 0.19 to >256 mg/L with the observed MIC 50 and MIC 90 of the strains were 32 mg/L and 256 mg/L. FA resistance rate of 64 *S.aureus* was 79.7% (51/64) and 78.1% (50/64) using a MIC breakpoint of > 1 mg/L and a breakpoint of ≥ 2.0 mg/L for resistance determination. Using EUCAST/FSM criteria, three of 13 strains susceptible to FA by E-test were resistant with DD method. Overall the agreement of the two tests were 93.7% with only four discrepant results. Over 70% of the resistant strains to penicillin, cefoxitin, ampicillin-sulbactam, gentamicin, amikacin, erythromycin, clindamycin, ciprofloxacin, rifampicin and chloramphenicol were susceptible to FA. Of 53.7% of co-trimoxazole resistant strains were susceptible to FA.

CONCLUSIONS

We identified that disk diffusion testing results according to FSM/EUCAST correlated well with the MIC interpretive criteria applied by EUCAST (four discrepancy) confirming the strong correlation between DD and MIC regardless of the interpretative criteria used. Studies on comparisons of the different zone diameter breakpoints suggested from the different societies could also help the accurate interpretation for resistance development for further studies.

REFERENCES

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Table. Fusidic acid DD and MIC breakpoint interpretations

Reference	DD (mm)			MIC (mg/L)	
	S	I	R	S	R
FSM [1]	≥ 24	-	<24	≤ 1	>1
EUCAST [2]	≥ 24	-	<24	≤ 1	>1
Skov et al. [3]	≥ 21	19-20	≤ 18	≤ 1	>1
Skov et al. [3]				≤ 0.5	≥ 2
Jones et al. [4]	≥ 22	20-21	≤ 19	≤ 1	≥ 4

Table. Comparison of DD and E-test method

	DD (mm)	E-test MIC (mg/L)		Total
		S (≤ 1)	R (>1)	
EUCAST/FSM	S (≥ 24)	10	1	11
	R (< 24)	3	50	53
Skov et al. [3]	S (≥ 21)	12	1	13
	I (19-20)	1	-	1
	R (≤ 18)	-	50	50
Jones et al.[4]	S (≥ 22)	12	1	13
	I (20-21)	1	-	1
	R (≤ 19)	-	50	50