

Trends in Resistance of *Staphylococcus aureus* from Blood in the UK and Ireland 2001-2005

C2-1143

and Activity of Telavancin in 2005

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BACKGROUND

The BSAC Bacteraemia Resistance Surveillance Programme has monitored antimicrobial resistance in organisms causing bacteraemia since 2001.

Tigecycline has been tested since 2002, ceftobiprole since 2003, and daptomycin in 2003 and 2005. The lipoglycopeptide telavancin was first tested in 2005.

METHODS

Each year, 25 centres in the UK and Ireland contributed up to 10 *S. aureus* isolates from blood for central testing by the BSAC agar dilution method.

Analyses (linear regression of log MICs, and logistic regression for resistance) took account of inter-centre variation and the interval-censored nature of MIC data.

RESULTS: MIC distributions and newer agents

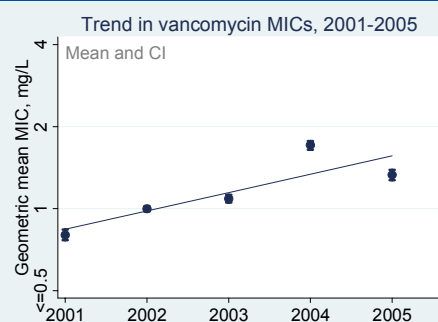
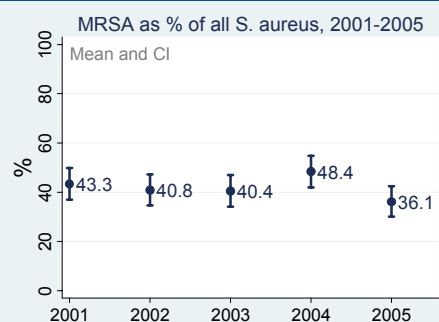
		MIC distributions - % of isolates at each MIC (mg/L)														
group	agent	N	0.06	0.12	0.25	0.5	1	2	4	8	16	32	64	128	256	512
Resistance typical of UK MRSA	oxacillin	1206				54.1	2.8	1.2	0.2	0.2	0.6	0.2	1.4	7.3	31.8	***
	ciprofloxacin	1206	0.7	5.5	26.5	21.6	2.6	0.7	0.4	2.8	2.7	8.4	19.7	8.5	***	
	erythromycin	1206		5.5	42.0	9.7	0.2	3.9	0.2	0.7	0.7	1.1	0.2	35.7	***	
Established anti-MRSA agents	vancomycin	1206			***	7.8	64.7	27.4	0.1							
	teicoplanin	1206			***	24.1	60.3	14.7	0.8	0.1						
	linezolid	1206			***	0.2	2.4	85.7	11.6							
Recent & developmental agents	daptomycin	479				16.1	71.0	12.9								
	tigecycline	968	0.1	16.5	76.3	6.9	0.1									
	ceftobiprole	723				6.9	41.6	20.6	30.4	0.4						
	telavancin	244				13.1	73.4	13.5								

Resistance to ciprofloxacin and erythromycin was more prevalent in MRSA (97 & 83%) than MSSA (9 & 30%).

Both established and newer anti-MRSA agents had narrow unimodal MIC distributions, evidence of a continuing lack of resistance.

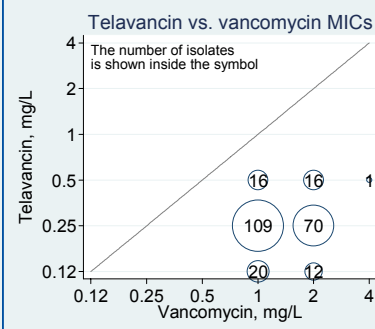
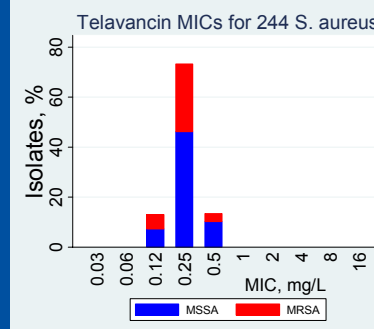
*** indicates censorship of adjacent MICs

RESULTS: Trends in resistance



There were no significant trends in the percentage of isolates resistant to oxacillin (MRSA), ciprofloxacin, erythromycin or other agents tested in all five years. Overall, 41.8% of *S. aureus* from bacteraemia were MRSA. Large-scale mandatory surveillance over the same period in England also shows the MRSA rate to be stable at around 40%.

There was a statistically significant upward trend in vancomycin MICs, equivalent to a doubling of MICs over a 5-year period (CI 2.0 - 2.2, $p < 0.001$). This result should be treated with caution: there is potential for confounding of laboratory variation with year as isolates are batched and tested annually. (Censoring ignored in graph, but considered in regression.)



Telavancin had a very narrow unimodal MIC distribution, similar for MRSA and MSSA. Telavancin MICs were on average 2.4 dilutions lower than vancomycin, (5.4-fold, CI 5.1 - 5.7), but the range was too narrow to show a relationship between telavancin and vancomycin MICs for individual isolates.

CONCLUSIONS

- Resistance rates in *S. aureus* from blood in the UK and Ireland have been high but stable over the last 5 years.
- There was some evidence of upward creep in the MICs of vancomycin, in both MRSA and MSSA, over the same period, but further investigation is required.
- Vancomycin, teicoplanin, linezolid and newer agents including daptomycin, tigecycline, ceftobiprole and telavancin remain consistently active against these resistant *S. aureus*.

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