

Staphylococcus aureus bacteriuria: don't miss the infective endocarditis

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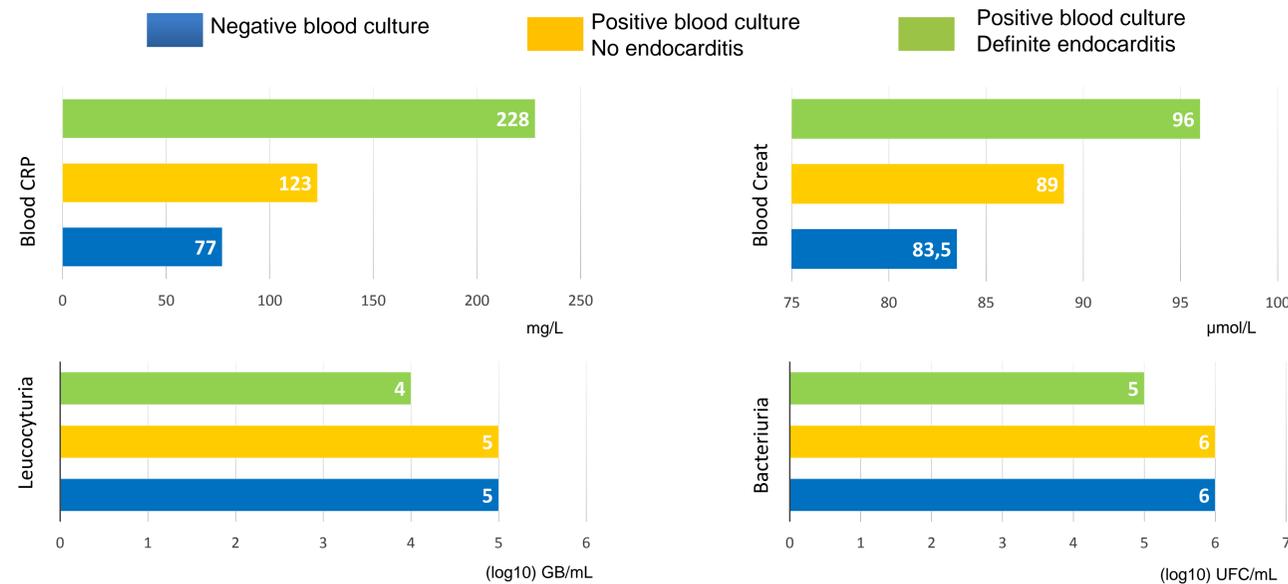
Introduction

The detection of *Staphylococcus aureus* in urine is often interpreted as a "staphylococcal urinary tract infection". However, considering that *S. aureus* has no or weak tropism for the urinary epithelia, a bloodstream infection with secondary renal infection is more likely (except in the case of a recent procedure concerning the urinary tract such as surgery). We aimed to determine among patients presenting with *S. aureus* bacteriuria the proportion who also had i) a bacteremia with the same germ and ii) an infective endocarditis.

Population and Methods

Records of patients with positive urine culture for *S. aureus* culture between 2007 and 2014 were retrospectively reviewed. Among others, results of performed blood culture and echocardiography (transthoracic echocardiography [TTE], transesophageal echocardiography [TOE], if any) were collected. The diagnosis of infective endocarditis was made on Duke modified criteria.

Blood (Reactive C protein, Creatinine) and urine (Bacteriuria and Leucocyturia) parameters in different groups (Median Value):



Results

684 patients (69.1±21 years, 412 men and 272 women) were included. One hundred fifty-six patients had undergone a urinary tract surgical procedure (surgery of either kidney, prostate, bladder, ureteral, urethral, or ureteral stent setting) in the 4 weeks preceding the urine culture.

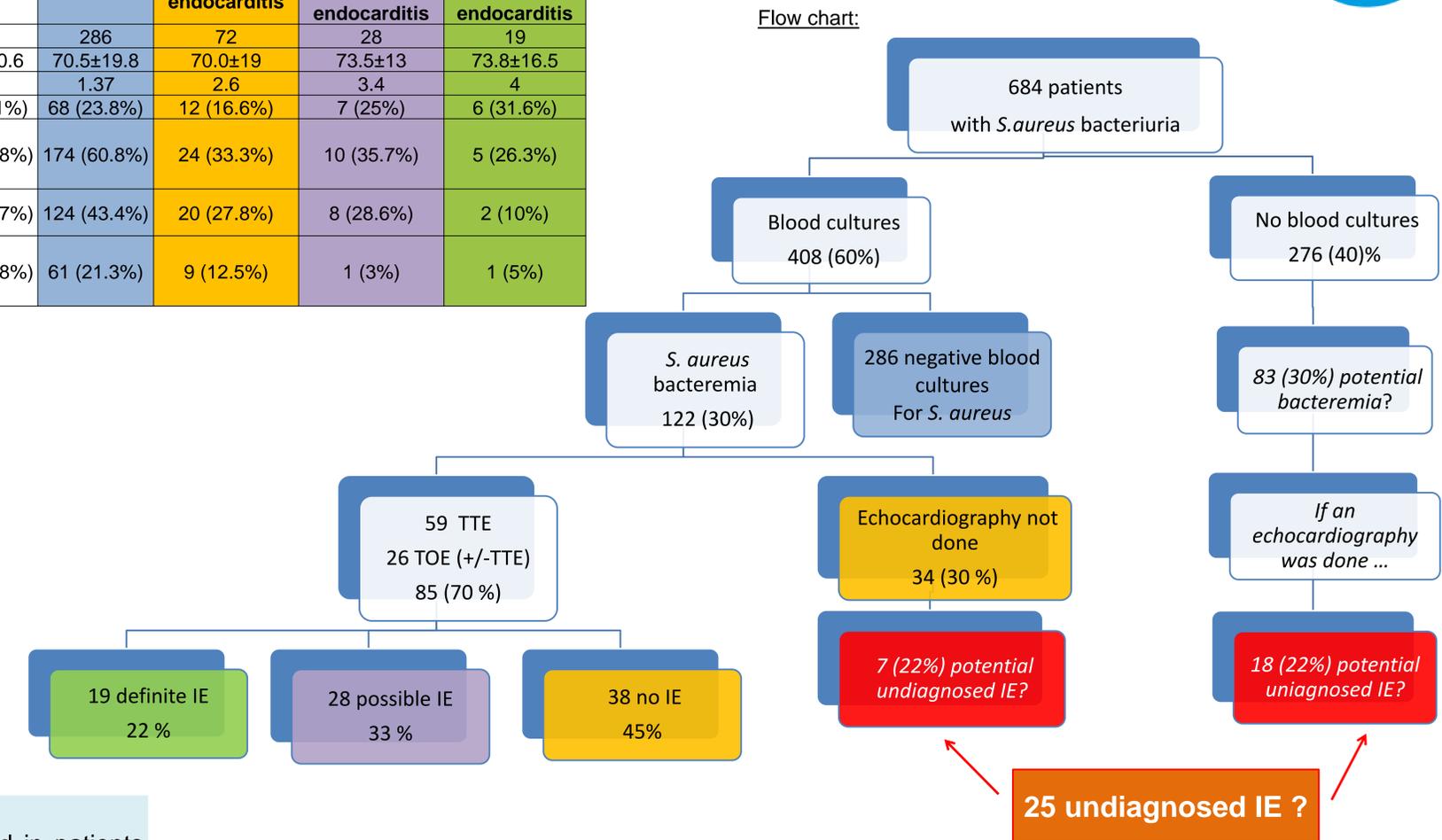
Four hundred and twenty (60%) had blood culture, featuring 122 (30%) with positive blood culture for the same *S. aureus*. For these 122 patients, an echocardiography was performed in 85 cases (70%). In these last population, 19 patients were diagnosed with definite infectious endocarditis, and 28 with a possible infectious endocarditis. Only one of the first patients had a recent urologic procedure.

C-reactive protein blood concentration was higher in patients with positive vs

negative blood culture (172.4±117 vs 96±84 mg/L, p<0.0001) and in patients with definite/possible endocarditis vs no definite/possible endocarditis after echocardiography (214.3±130 vs 140.7±97 mg/L, p=0.006); no significant difference was observed with age, creatinine, leucocyte urinary count or *S. aureus* urinary count.

If we assume that the patients who had blood culture (either positive or negative) were not different from the patients who had not, and that the patients with positive blood culture who received an echocardiography were not different than the ones who did not, 25 endocarditis cases may have been underdiagnosed in our population.

Population	Total	Negative blood cultures	Positive blood culture, TTE/TOE : no endocarditis	Positive blood culture, TTE/TOE : Possible endocarditis	Positive blood culture, TTE/TOE : definite endocarditis
Patients (n)	684	286	72	28	19
Age (years)	69.1±20.6	70.5±19.8	70.0±19	73.5±13	73.8±16.5
Sex ratio (M/F)	1.5	1.37	2.6	3.4	4
Diabetes	145 (21%)	68 (23.8%)	12 (16.6%)	7 (25%)	6 (31.6%)
Nosocomial bacteriuria (>48h hospitalization)	361 (52.8%)	174 (60.8%)	24 (33.3%)	10 (35.7%)	5 (26.3%)
Urological comorbidities	299 (43.7%)	124 (43.4%)	20 (27.8%)	8 (28.6%)	2 (10%)
Urological procedures (< 4 week before urine culture)	156 (22.8%)	61 (21.3%)	9 (12.5%)	1 (3%)	1 (5%)



Conclusion

Among the patients with *S. aureus* bacteriuria, bacteremia is detected in 30% of patients who had blood culture, and diagnosis of definite/probable infective endocarditis is made in 55% of cases if sought. An haematogenic mechanism must be therefore suspected in this situation; blood cultures and (if positive) echocardiography should be systematically performed in case of *S. aureus* bacteriuria.

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Conflict of interest: Aucun Key Word: Staphylococcus aureus, endocarditis, bacteriuria

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