Salvage strategy for long-term central venous catheter-related *Staphylococcus aureus* infections in children

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Background

- The use of long-term central venous catheter (CVC) in children is associated with serious complications such as central-line associated bloodstream infection (CLABSI) (1)
- Current international guidelines strongly recommend catheter removal in case of *S. aureus* CLABSI, as it is associated with high risk of failure or complications (2)
- Pediatricians are however often tempted to have a catheter salvage strategy (CSS) because of the inconvenience of catheter replacement in children
- No data is available regarding the outcome of CSS in children

Methods

- Retrospective observational study from 2010 to 2014 in a tertiary care teaching hospital
- Inclusion of all children <18 years having a probable or proven *S. aureus* CLABSI on a long-term CVC
- **CSS was defined** as CVC left in place ≥ 3 days after initiation of empiric treatment for suspected bacteremia
- **Failure was defined** as persistence or relapse of bacteremia with the same microbial species, or the occurrence or the worsening of local or systemic infectious complication between 72 hours and 28 days after the first positive blood culture

Results

- 49 *S. aureus* CLABSI were observed in 41 children (Figure), sex ratio (M/F) was 0.70, and median age at the time of infection 1.4 years [0.1-16.9]
- 44 patients (59%) had a digestive pathology requiring parenteral nutrition, 14 (34%) had an immune deficiency
- **CSS was chosen in 37 (76%) cases and failed in 12 (32%)** due to persistence/relapse of bacteremia, thrombophlebitis, endocarditis or tunnel infection
- Initial presence of bloodstream co-infection, serum concentration of vancomycin under the targeted value, and inadequate empiric treatment were statistically significantly associated with CSS failure ($p < 0.05$) (Table)

Figure. Flow chart of *S. aureus* CLABSI

	Failure (%) n=12	Success (%) n=25	P value
General characteristics			
Age, year; median [range]	1.5 [0.3-6.9]	1.6 [0.2-16.9]	0.81
Male	5 (42)	9 (36)	0.74
Immunosuppression	4 (33)	7 (28)	0.74
Tunneled $\pm$ sleeved catheter	10 (83)	22 (88)	0.70
Days of catheter use; median [range]	28 [2-548]	15 [0-468]	0.25
Infectious episode			
Local symptoms at onset	4 (33)	7 (28)	0.74
Severe sepsis at onset	4 (33)	2 (8)	0.05
CRP at onset (mg/L) median; [range]	57 [7-165]	73 [6-245]	0.76
Polymicrobial infection	5 (42)	3 (12)	0.04
<i>S. aureus</i> methicillin resistant strain*	2 (17)	4 (16)	0.96
Empiric treatment			
Cloxacillin	0 (0)	1 (4)	0.51
Adapted vancomycin serum concentration	2 (29)	13 (72)	0.04
Combined therapy	4 (33)	10 (40)	0.69
Antibiotic locks	2 (17)	2 (8)	0.43
Repair kit	3 (25)	2 (8)	0.16
Inadequate empiric treatment	2 (17)	0 (0)	0.04

* Pathogen susceptible to the administered antibiotics on antibiogram (EUCAST); # anti-staphylococcal antibiotic combined with rifampicin or an aminoglycosid

Table. Factors associated with the failure of a conservative therapy

Conclusion

- This is the first observational study focusing on long-term *S. aureus* CLABSI management in children.
- We reported that CSS for long-term CVC-related *S. aureus* infections was frequent (76%) in a French university hospital and frequently successful

Références: 1. Raad I, J. Infect. Dis. 1993; 2. Mermel LA, Clin Infect Dis. 2009

Conflicts of interests: none; Funding: None