Significant Reduction of Blood Culture Contamination in the Emergency Department (ED) Using the Steripath® Blood Diversion Device

2035

[1]Chawat Tongma, [1]Ka Yeon Lee, [1]Ajay Bhasin, [1]Marites B. Gonzaga-Reardon, [1]Edward Ward, [1]Pamela Hagen, [2]Kamaljit Singh
[1]Rush University Medical Center, Chicago, IL, [2]NorthShore University Health System, IL

Chawat Tongma, MD
Rush University Medical Center
600 S. Paulina St. Suite 143
Chicago, IL 60612
Tel: 312-942-5865
tchawat@gmail.com

Background

- Contaminated blood cultures are a particular problem in Emergency Departments (EDs) and often lead to unnecessary antibiotic treatment.
- A potential approach to reduce blood culture contamination is to discard the initial aliquot of blood which is contaminated with skin plugs and bacteria.
- To test this approach, we performed a study using the Steripath® (SP) device (Magnolia Medical Technologies, WA) a pre-assembled, sterile blood culture system designed to divert the initial 1.5-2.0 mL of blood prior to bottle inoculation.

Methods

- This was a pre-post intervention study conducted in the ED at Rush University Medical Center, Chicago.
- During the pre-intervention phase (1 September to 30 November 2015), 2 sets of peripheral blood cultures were collected using standard aseptic technique by nurses in the ED. Skin antisepsis was performed with ChloraPrep® and 5-10 mLs of blood was inoculated into BacT Alert FAN bottles (Biomerieux).
- During the intervention phase (1 February to 1 May 2016), blood cultures were collected using the SP device. All bottles were incubated for 5 days and rates of contamination were compared between the control and intervention periods.

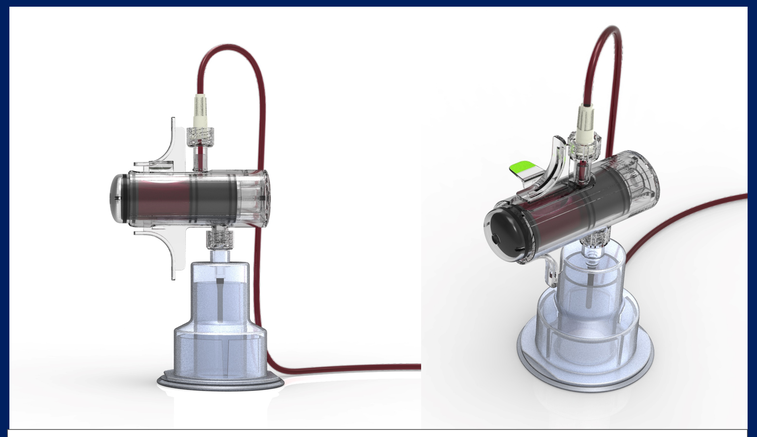

Figure.1 Steripath® (SP) device, a pre-assembled, sterile blood culture system designed to divert the initial 1.5-2.0 mL of blood prior to bottle inoculation.

Control phase contaminants	Coag-neg Staphylococcus	29	72.5%
	Micrococcus	4	10.0%
	Corynebacterium	3	7.5%
	Viridans Streptococcus	2	5.0%
	Bacillus non-anthracis	1	2.5%
	E. faecium	1	2.5%
Intervention phase contaminants	Coag-neg Staphylococcus	1	33.3%
	Alpha-hemolytic Streptococcus	1	33.3%
	Corynebacterium non-jeikeium	1	33.3%

Table. 1 Blood culture contaminants during control and intervention phases.

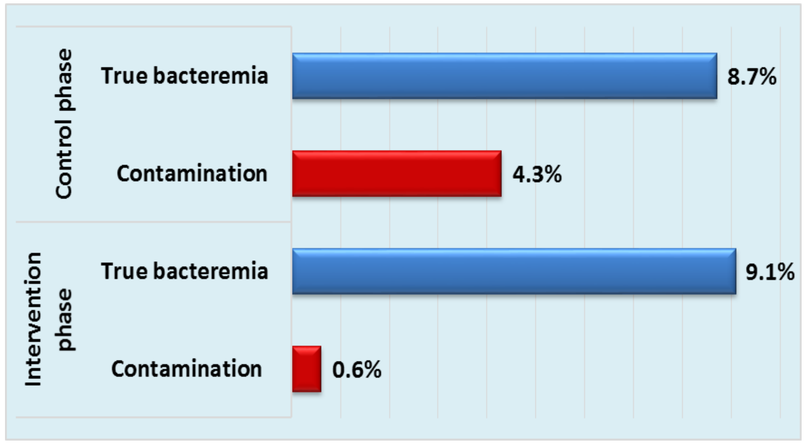

Figure. 2 Comparison of the rates of true bacteremia and blood culture contamination during control and intervention phases.

Conclusion

- The use of the SP device in the ED over a 3-month period significantly reduced the rate of blood culture contamination from 4.3% to 0.6% while the rates of true bacteremia remain unchanged.
- The SP device represents a simple and effective method for reducing blood culture contamination

Results

Control phase:

- There were 929 sets of blood cultures collected in the ED during the pre-intervention phase.
- A total of 40/929 sets (4.3%) from 36 patients were identified as contaminations. The list of blood culture contaminants are shown in Table 1
- 81 sets (8.7%) from 51 patients were identified as true bacteremia.

Intervention phase:

- During the intervention phase, 3/539 (0.6%) sets of blood cultures from 3 patients were contaminated ($p<0.001$).
- The 3 contaminants included: 1 CoNS, 1 alpha-hemolytic Streptococcus spp. and 1 Corynebacterium spp.
- 49 sets (from 35 patients) were identified as true bacteremia (9.1%).

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