



Impact of an interventional bundle on complications associated with peripheral venous catheters in elderly patients

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INTRODUCTION

- Elderly patients admitted to geriatrics departments often require peripheral venous catheters (PVC), which should be inserted and maintained following a series of preventive recommendations.
- Our **objective** was to evaluate the impact of a training **bundle** comprising measures aimed at reducing complications associated with the use of PVC in elderly patients admitted to a tertiary teaching hospital.

MATERIAL AND METHODS

- Observational, pre-post-intervention study to analyze the impact of an interventional bundle on the reduction of complications associated with the use of PVCs.
- We included 344 adult patients hospitalized in the Geriatrics Department whose 475 PVC were inserted anywhere in the hospital <24 h after insertion, whose life expectancy was >48–72 h, and whose PVC had an expected indwelling time of >24 h. In addition, there could be no evidence or suspicion of PL-RBSI at enrolment.
- Intervention:** use of saline solution (PosiFlush™, Becton Dickinson) for catheter maintenance, use of sterile gloves for PVC insertion, use of 2% alcoholic chlorhexidine wipes in single-dose format for skin disinfection prior to insertion of the PVC, passive disinfection with 70% alcohol–impregnated caps (Curos™, 3 M, Minnesota, USA).

CONCLUSIONS

- The implementation of a bundle **slightly** reduces phlebitis and colonization rates, albeit not significantly.
- It is necessary to carry out **randomized** studies including all the risk factors to evaluate the most cost-effective measures for reducing complications associated with PVCs.

RESULTS

- No statistically significant differences in demographic characteristics were observed between the study periods.
- The **colonization** and **phlebitis** rates per 1,000 admissions in both periods were, respectively: 36.7 vs. 24.3 (p=0.198), and 81.5 vs. 65.1 (p=0.457).
- The main reason for catheter **withdrawal** was obstruction/malfunctioning.
- Obstruction** rate was higher for those inserted in the hand than for those inserted at other sites (55.7% vs. 44.3%, p=0.045).
- Microorganisms’ distribution in colonized catheters were as follows: Gram-positive, 93.2%; Gram-negative, 2.7%; and yeasts, 4.1%. *S. epidermidis* and other CoNS were the most frequent (67.6%). *S. aureus* was not isolated.

Characteristic of PVCs	Overall, N=475	Pre-intervention period N=285 (60.0%)	Post-intervention period N=190 (40.0%)	p
Median (IQR) catheter indwelling time, days	3.0 (2.0-6.0)	3.0 (2.0-6.0)	3.0 (2.0-5.3)	0.164
Catheter duration, N (%)				0.708
0-3 days	242 (50.9)	143 (50.2)	99 (52.1)	
>3 days	233 (49.1)	142 (49.8)	91 (47.9)	
Insertion at, N (%)				0.003
Geriatric department	349 (73.5)	194 (68.1)	155 (81.6)	0.001
Emergency room	113 (23.8)	83 (29.1)	30 (15.8)	0.001
Other	13 (2.7)	8 (2.8)	5 (2.6)	0.909
Site of insertion, N (%)				0.825
Hand	295 (62.1)	176 (61.8)	119 (62.6)	0.847
Forearm	70 (14.7)	40 (14.0)	30 (15.8)	0.597
Antecubital fosse	44 (9.3)	29 (10.2)	15 (7.9)	0.401
Arm	66 (13.9)	40 (14.0)	26 (13.7)	0.914
Indication use, N (%)				0.001
Antimicrobial therapy	235 (49.5)	131 (46.0)	104 (54.7)	0.061
Serum therapy	81 (17.1)	65 (22.8)	16 (8.4)	<0.001
Parenteral nutrition	6 (1.3)	3 (1.1)	3 (1.6)	0.615
Other	153 (32.2)	86 (30.2)	67 (35.3)	0.245
Reason for catheter withdrawal, N (%)				0.012
Obstruction/malfunctioning	158 (33.3)	100 (35.1)	58 (30.5)	0.277
End of use	137 (28.8)	81 (28.4)	56 (29.5)	0.804
Suspicion of infection	84 (17.7)	50 (17.5)	34 (17.9)	0.922
Accidental	55 (11.6)	39 (13.7)	16 (8.4)	0.079
Pulled out by the patient	1 (0.2)	1 (0.4)	0 (0.0)	0.414
Extravasation	40 (8.4)	14 (4.9)	26 (13.7)	0.001
Appearance of site of infection, N (%)				
Phlebitis	124 (26.1)	69 (24.2)	55 (28.9)	0.250
Pain	74 (15.6)	42 (14.7)	38 (16.8)	0.535
Erythema	84 (17.7)	42 (14.7)	42 (22.1)	0.039
Induration	70 (14.7)	37 (13.0)	33 (17.4)	0.186
Pus	1 (0.2)	0 (0.0)	1 (0.5)	0.220
Phlebitis per 1,000 admissions	76.3	81.5	65.1	0.457
PCV colonization, N (%)	50 (10.5)	31 (10.9)	19 (10.0)	0.760
PVC colonization per 1,000 admissions	30.8	36.7	24.3	0.198
Infection, N (%)	18 (3.8)	5 (1.8)	13 (6.8)	0.652
Respiratory	4 (0.8)	1 (0.4)	3 (1.6)	
Urinary	5 (1.1)	2 (0.7)	3 (1.6)	
Abdominal	3 (0.6)	0 (0.0)	3 (1.6)	
Other	6 (1.3)	2 (0.7)	4 (2.1)	