The implementation of a surveillance program to prevent catheter-related bloodstream infections in Intensive Care Units

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INTRODUCTION

Vascular catheter related bloodstream infections (VCR-BSI) are one of the most severe complications of vascular catheterization (VC). Multimodal strategies, including educational programs, implementation of preventive measures and continuous surveillance of VCR-BSI have demonstrated great effectiveness.

STUDY AIM

Determine the efficacy of a VCR-BSI prevention program implemented in our Intensive Care Units (ICUs).

METHODS

Setting: Bellvitge University Hospital, a tertiary 700-beds medical centre, with a 34 ICU-beds.

Design: quasi-experimental design; before-and-after intervention study.

Main outcome: VCR-BSI according to CDC definition.

Study period: from January 2012 to December 2017. The preventive program was implemented in mid-2014

Rates of VCR-BSI were compared between **pre-intervention period** (Pre-IP: 2012-2014) and **intervention period** (IP: 2015-2017).

PREVENTIVE VCR-BSI PROGRAM

Prospective surveillance of episodes of VCR-BSIs through daily **meetings** with members of the microbiology department

Training of preventive measures among ICUs healthcare workers

Daily round wards: monitoring VC condition performed by a member of the infection control team (ICT)

Introduction of a central line insertion **checklist**

Feed-back: All episodes of VCR-BSIs were **reported** to the ICU team by an ICT member

RESULTS

During the study period **150 episodes of VCR-BSI** were diagnosed; among them 92 during the Pre-IP and 58 during the IP.

Demographic and clinical characteristics of patients between both periods were similar.

CONCLUSION

The **intervention program was effective** in decreasing the rate of VCR-BSI in ICU, although this reduction was not observed among PICVC. **Better strategies to prevent PICV-BSI are needed.**

Demographic and Clinical Characteristics

Age (median, years)	63 (SD +/- 13)
Male sex, n (%)	102 (68%)
Basal Disease	
Medical	50 (33.3%)
Surgical	95 (63.3%)
Traumatology	5 (3.3%)

Catheter Characteristics

Average insertion days	9 (SD +/- 6)
Arterial, n (%)	20 (13.3%)
CVC ¹ , n (%)	81 (54%)
Subclavian	28 (34.6%)
Jugular	42 (51.8%)
Femoral	11 (13.6%)
PICVC ² , n (%)	32 (21.3%)
Shaldon, n (%)	17 (11.3%)

¹ CVC: Central Venous Catheter

² Peripherally Inserted Central Venous Catheter

Aetiology

Coagulase Negative Staphylococci	35 (23.3%)
<i>K.pneumoniae</i>	26 (17.3%)
<i>P.aeruginosa</i>	23 (15.3%)
<i>A.baumannii</i>	10 (6.6%)
<i>S.aureus</i>	9 (6%)

Outcomes Rates (n° of episodes/1,000 catheter-days)

	Pre-IP (n=109)	IP (n=41)	pValue
Global	1.62	0.61	<0.001
CVC	3.21	1.08	<0.001
Subclavian	3.09	0.73	<0.001
Jugular	2.96	1.46	0.05
Femoral	3.34	0.39	<0.001
PICVC	1.72	1.20	NS
Shaldon	4.07	0.30	<0.001
Arterial	0.41	0.18	0.05

ICU VCR-BSI Rates