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Nationwide study on peripheral venous catheter-related bloodstream infections in internal medicine departments

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Background: During last years, the use of peripheral venous catheters (PVCs) has increased outside the intensive care unit, with a consequent increase of the peripheral catheter-related bloodstream infections (PC-RBSI). In Spain, rates up to 0.18 episodes of PC-RBSI/1,000 patient-day have been described in patients admitted to teaching institutions. Internal medicine departments (IMD) are one of the main wards in which PVC are widely used. However, data regarding the incidence of PC-RBSI and its characteristics in IMD are scarce. Our objective was to assess the incidence of PC-RBSI episodes detected in IMD in Spain.

Material/methods: This was a multi-center prospective observational cohort study performed in 14 Spanish IMD from June 2015 to June 2016. We included adult patients (>18 years) admitted to IMD with at least one PVC and bacteraemia. Demographic and clinical data were obtained from local coordinators.

Results: During the study period, the 14 institutions received an overall of 302,779 admissions, 42,577 of them corresponded to IMD. We collected a total of 70 episodes of PC-RBSI from 70 patients which represented an overall rate of 1.64 PC-RBSI episodes/1,000 IMD admissions. We estimated that this represented a PC-RBSI rate of 0.28 episodes/1,000 catheter days, based on previous studies of our group. Patients had a mean (SD) age of 67.44 (16.72) years and 60.0% were male. The crude mortality and the attributable mortality rates were 12.9% and 5.7%, respectively. The median (IQR) catheter indwelling time was 6 (4-12) days. Twenty six PVC (37.1%) were inserted in emergency departments, and only 21 (30.3%) were inserted in medical or surgical wards. It was estimated that 25.7% of the PVCs in place were no longer necessary at the inclusion day. *Staphylococcus aureus* was the most frequently isolated microorganism (41.7%). Out of the 70 episodes, phlebitis was clinically evident in 44 (62.9%) episodes. A multivariate analysis showed phlebitis as an independent predictor of catheter insertion in emergency departments (OR=5.44, 95% CI, 1.54-19.30; p=0.009).

Conclusions: Our study shows that PVCs have a significant risk for bacteraemia. Clinically evident phlebitis is not always present among patients with bacteraemia. PVCs inserted in emergency departments should be particularly surveyed. Our findings support that it is necessary to introduce educational and interventional preventive measures both in IMD and emergency departments to reduce PC-RBSI rates and its associated comorbidities and costs.