

Temporal evolution of vascular access devices in an intensive care unit : an observational time series study

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Introduction

The selection and proper care of vascular access devices (VADs) in critically ill patients are key given their direct impact on safety, morbidity and mortality, and the efficacy of intravenous treatments administered. The latest scientific evidence has incorporated new VADs, securement systems, and intravenous therapy materials into clinical practice, aimed at reducing adverse events.

Objective

The aim of this study is to analyse the temporal progression of vascular access devices, securement/dressing materials and intravenous systems used in the intensive care unit of a secondary-level hospital, as well as to describe changes in their use throughout the study period.

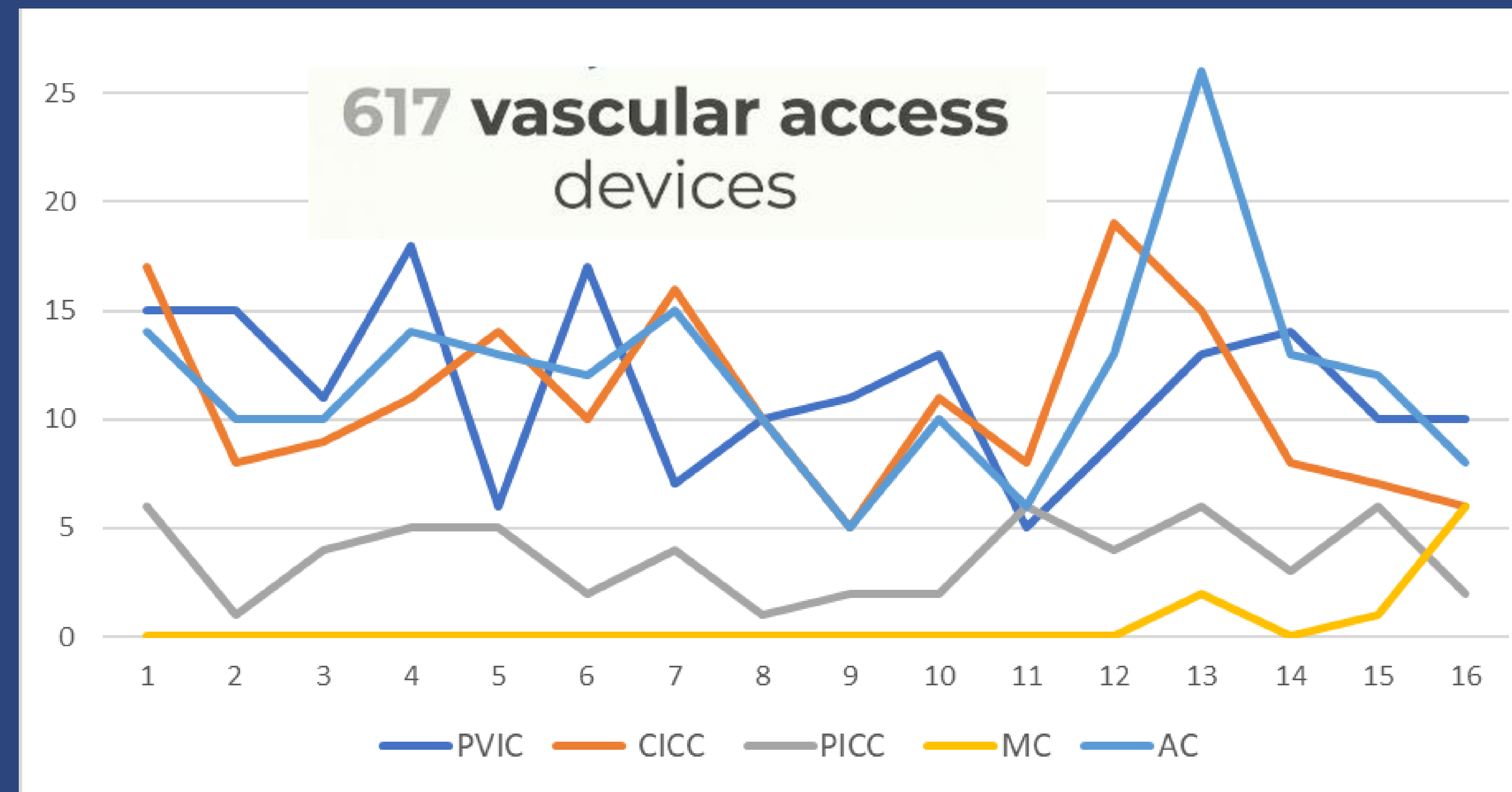
Methodology

Observational, retrospective time series study conducted in a secondary hospital. The study tool was a database obtained through 16 cross-sectional samples taken in the ICU. The type of VAD, dressing used, usability of vascular access, location and post-catheter access were analysed. The progression of an Intravenous Therapy Quality Index was analysed. The study period was from February 2017 to October 2024.

Conclusion

CICC, arterial catheters, and PVIC were the most prevalent devices. There is a trend toward increased use of PICC and Midline and a consolidation of closed systems and advanced dressings. These findings reflect the result of implementing a vascular access strategy focused on safety and quality of care.

Results



Arterial Catheter(n: 191-31%), PIVC (n: 184-29.8%) and CICC (n: 174-28.2%) were the most prevalent. The use of PICCs was irregular, reaching a maximum of 16.7% in the cross-section 15. MC are described from cut 13 onwards, with a progressive increase to 18.8% in the cross-section 16 (p=0,01).

Closed systems were described in 81,0% of cases. The trifurcated extension tube with CLA was incorporated from cross-section 9 (34.8%) (p=0,001).

The mean quality indicator was **9.50** (SD 0.972)

Time Point	Mean	Standard Deviation (SD)	CI 95%	
			Lower Limit	Upper Limit
1	9.46	0.852	9.22	9.69
2	9.34	1.41	8.85	9.83
3	9.46	0.979	9.11	9.80
4	9.54	0.949	9.26	9.82
5	9.30	1.08	8.95	9.65
6	9.33	1.25	8.94	9.73
7	9.14	1.25	8.75	9.54
8	9.96	0.195	9.89	10.0
9	9.28	1.24	8.75	9.82
10	9.60	0.853	9.31	9.89
11	9.89	0.393	9.73	10.1
12	9.61	0.838	9.36	9.86
13	9.77	0.446	9.66	9.89
14	9.71	0.665	9.49	9.93
15	9.29	1.08	8.93	9.66
16	9.15	1.11	8.75	9.55

