

Abstract:

Background: Peripherally inserted central catheters (PICCs) and totally implanted vascular access ports (PORTs) have been widely used for medium- to long-term chemotherapy. PICCs are associated with lower insertion cost, but higher complication rates than PORTs. However, there is a paucity of cost-effectiveness comparisons between the devices. We aimed to compare the cost-effectiveness of PICCs and PORTs for medium- to long-term chemotherapy from catheter insertion to removal.

Methods: A cost-effectiveness analysis was conducted based on propensity score matching (PSM) from the hospital perspective. Data were collected from a retrospective cohort study. The total cost outcome comprised insertion, maintenance, removal and complication costs. The effectiveness outcome was the complication-free rate. The primary and supplemental outcomes were cost-effectiveness ratios (CERs) and incremental cost-effectiveness ratios (ICERs).

Results: A total of 1050 patients (after PSM for 417 patients) were included. The average total cost for 3-6 month ($\$603.55 \pm 78.68$ vs $\$1270.21 \pm 128.84$), 6-9 month ($\731.40 ± 42.97 vs $\$1414.48 \pm 155.43$), and 9-12 month ($\966.83 ± 53.78 vs $\$1587.76 \pm 160.56$) dwell times were all significantly lower for PICCs than for PORTs ($p < 0.001$). PICCs were associated with significantly lower complication-free rates than PORTs during the 3-6 month (65.22% vs 90.58%, $p < 0.001$), 6-9 month (53.33% vs 91.80%, $p < 0.001$), and 9-12 month (44.44% vs 88.46%, $p = 0.015$) dwell times. Ultimately, PICCs were associated with lower CERs than PORTs for the 3-6 month (928.54 vs 1395.84) and 6-9 month (1380.00 vs 1537.48) but higher CER for the 9-12 month (2197.34 vs 1804.27) dwell times. ICERs were 2564.08 and 1751.49 with dwell times of 3-6 months and 6-9 months, respectively.

Conclusion: This study provided economic evidence that informs vascular access device choice for medium- to long-term chemotherapy. For 3-9 month dwell times, PICCs were more cost-effective than PORTs. Furthermore, ICERs were applied and the choice was determined by willingness-to-pay. For 9-12 month dwell times, PORTs might be more cost-effective than PICCs, and studies with larger sample size would be needed to verify this finding in the future.

Reference:

Wang K, Zhou Y, Huang N, Lu Z, Zhang X. Peripherally inserted central catheter versus totally implanted venous port for delivering medium- to long-term chemotherapy: A cost-effectiveness analysis based on propensity score matching. *J Vasc Access*. 2021 Feb

12:1129729821991360. doi: 10.1177/1129729821991360. Epub ahead of print. PMID: 33579176.