Peripheral Intravenous Cannula Usage in the Emergency Department

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Abstract

Over a billion Peripheral Intravenous Cannulas (PIVC) are used globally every year with at least 25 million sold annually in the UK.1,2 The NHS spends an estimated £29m of its annual acute sector budget on PIVC procurement3 and around 70% of all hospitalised patients require at least one PIVC during their stay.4 Despite their extensive and routine use, PIVC failure rates are reported as high as 50-69%.5,7 In addition, many PIVCs remain unused following insertion, particularly in the Emergency Department (ED).5,9 The risk factors for PIVC failure are not well understood and the literature has found extensive regional variation in practice when it comes to PIVC insertion and management.1,7,10 While various technologies have been developed to address these issues, there remains a need for standardised, evidence-based guidelines.

Introduction

We conducted a semi-structured healthcare questionnaire survey in the Royal Infirmary of Edinburgh ED which aimed to evaluate the failure rate of PIVCs inserted pre-hospital and in the ED and identify factors associated with failure. Failure was defined as loss of PIVC function due to extravasation, phlebitis or occlusion.

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Conclusions

In conclusion, we found a high PIVC failure rate (43%) in admitted patients. Dominant arm and pre-hospital insertion were significantly associated with PIVC failure and this is consistent with previous research.6 Based on these results, we would suggest...
that dominant arm insertion should be avoided where possible. Pre-hospital insertion should only be undertaken if deemed necessary rather than routine, whilst acknowledging that patients are often undifferentiated and at high risk of deterioration, meaning a lower threshold for PIVC insertion is not unreasonably common practice. While guidance suggests that PIVCs should last at least 3 to 4 days if clean and not infected, our results show earlier drops in PIVC survival. The largest drop was observed on day 2, by which time patients had all been transferred to the Acute Medical Unit and/or downstream wards. Further research is needed to investigate PIVC management on the wards and the effects of patient transfer on PIVC survival. PIVC failure was not significantly associated with admission to any specific downstream ward or specialty. However, we were unable to determine whether specific pathologies amongst patients contributed towards PIVC failure. Therefore, further research investigating the relationship between disease and PIVC survival would be useful. Overall, our findings highlight the prominence of PIVC failure and together with other published research can begin to inform the development of standardised guidelines, essential to control the extensive variance in practice and high PIVC failure rates.

References

Figure 1. PIVC Kaplan-Meier survival curves by insertion arm (a) and procedure location (b).