



Vascular accesses: Which choice? Less is more, more or less

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Abstract

In the context of in-hospital care management, the need for infusion therapies involves the choice of appropriate devices. Historically, there is no consensus about the preference for vascular accesses, although the data present in the literature would seem to favor peripheral ones due to fearful complications and a non-negligible rate of bloodstream infections. It is also true the decision for central routes is sometimes dictated by the patient’s general clinical conditions (especially as a result of surgery) or by the need to establish continuous short or long-term support therapies. Therefore, it would seem anachronistic to favor one strategy rather than another. Probably data should be reviewed, considering and evaluating the correct application of indications and guidelines for both positioning and management of venous accesses, without facing methodological biases that could lead to scarcity and inconclusive results; although it is undeniable that some conditions promote the onset of complications.

Keywords

Vascular access devices, sepsis, bundles, nosocomial infections

Venous availability is a crucial aspect of patients’ management in an in-hospital care setting. Historically, several devices have been adopted, including both peripheral and central catheters, whose daily use relies upon patients’ general clinical conditions, the need for continuous treatments or supports, and the extent of any previous surgical procedure. However, it is not possible to disregard or underestimate catheter-related complications, such as devices’ displacement, cellulitis, or infections claiming prompt revision or removal as far as life-threatening complications, such as pneumothorax, haemothorax, and vascular injury which could result in some cases even in the need for emergency surgery [1]. In common clinical practice, indications and infusions’ properties as well as concomitant patients’ disabilities should guide for the most appropriate device. However, intravascular devices are not free from infectious risks both in the short and long-term periods [2].



Recently, Ruiz-Giardin et al. [3] in a recent retrospective population study investigating catheter-related bloodstream infections and comparing central and peripheral devices over 101,690 hospital admissions, reported a significant increase in cumulative incidence per 1,000 patient-day of hospital stay risk for central venous devices compared to peripheral ones (0.36 vs. 0.11). However, central venous catheter patients had a higher index of comorbidities (malignancies, immunosuppression, need for surgery) and results might have been influenced by such enrollment disparities.

Tatsuno et al. [4], in a retrospective observational cohort study enrolling 234 matched bloodstream infection-cases (124 peripheral vs. 110 central catheters), reported similar incidences between cohorts (0.17 vs. 0.15 per 1,000 patient-day) with shorter hospitalization and catheter indwelling times in the peripheral group. Although a comparable safety profile, the authors concluded the absolute contribution to nosocomial infections of peripheral catheters was hardly definable in absolute terms as they were more frequently used in the hospital setting.

However, beyond mere technical dissertations, nosocomial related infections still remain an unsolved issue claiming debate and a crucial aspect for patients' safety in hospital settings because they are not only associated with increased hospital stay and mortality but also with extra attendant and social costs.

Reduction of catheter-related bloodstream infections could be achieved through education and implementation of care bundles in the effort to standardize practices and ensure preventions strategies for placement and maintenance [2]. Moreover, lack of consistency across bundle components and end points has made this aspect still unsolved and, as reported in a recent statement [3], most limitations would seem to derive from lack of strong evidences for specific bundle components among guidelines.

The choice of vascular access should be aprioristically evaluated from a presumptive assessment based on comorbidities, general clinical conditions, and estimation of the need for infusion therapies. The issue of bloodstream infections, on the other hand, would require epidemiological surveillance and trials to ensure stronger and less discretionary evidences.

Declarations

Author contributions

RF and MB: Conceptualization, Data Curation, Writing—original draft, Writing—review & editing. All authors contributed to manuscript revision, read and approved the submitted version.

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The authors declare that they have no conflicts of interest.

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