

Catheterisation of the brachial artery in children: should we be so concerned?

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TO THE EDITOR: Arterial catheterisation is often indicated for critical care patients to allow continuous haemodynamic monitoring and to facilitate blood sampling. However, it is associated with complications, with some considered minor (eg, bleeding, haematoma, local infection and temporary occlusion) and others considered major, requiring urgent limb- and/or life-saving treatment (eg, permanent occlusion, acute limb ischaemia, pseudoaneurysm and sepsis).

The general acceptance in both adult and paediatric patients is to preferentially catheterise the radial artery. It is easily accessible and considered relatively safe, as it normally has good collateral blood flow to the distal tissues. In reality, radial artery catheterisation in children is often not straightforward, particularly when performed in neonates, in pathological low-flow states, or if there have been preceding multiple attempts at the same site. Alternative arterial sites are more controversial due to a perceived increased risk of major complications; for example, the femoral artery has a higher infection risk, the brachial artery is an end artery with a risk of acute distal tissue ischaemia, and the axillary artery has a cerebral embolic risk due to its close proximity to the ipsilateral carotid artery.

The literature on the relative risks of different arterial catheterisation sites in adult and paediatric patients is hampered by being observational, composed of a heterogeneous patient and catheter mix, and with generally low complication rates giving relatively fragile data.

The salient conclusions from several publications on adult patients (one systematic review of 78 studies¹ and three large case series²⁻⁴) are that the catheterisation of the radial or femoral arteries is the most common. Most complications are minor and usually associated with radial and femoral artery catheterisation, while major complications are very rare and are predominantly associated with femoral and brachial artery catheterisation. In addition, the aforementioned specific concerns regarding the femoral, brachial and axillary artery sites are not borne out in the literature.

A large single-centre paediatric case series from Germany⁵ reported their experience of radial and brachial artery catheterisation in three body weight groups: less than 5 kg, 5–10 kg and 10–20 kg. Across these groups, most had radial artery catheterisation, which was less successfully performed with decreasing body weight. All complications were rare and none were major. There was also neither a significant

difference in the incidence of complications between the two catheterisation sites nor a large increment in the complications rate with multiple attempts at the same site.

Catheterisation of the radial artery has been the institutionalised primary choice, with sometimes considerable anxiety about the risks associated with other sites, especially in the paediatric population. However the theoretical risks associated with these other sites, in particular the brachial artery, seem to be unsupported. Perhaps we should be more comfortable to consider these as suitable alternatives when radial artery catheterisation is more challenging.

Competing interests

None declared.

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