

Optimizing Tourniquet Pressure to Improve Peripheral Intravenous Cannulation (PIVC) Insertion in Children

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Conclusion

- Tourniquets enlarge pediatric veins and reduce their compliance
- These effects may influence the likelihood of successful PIVC) insertion
- Group-level patterns were observed, but substantial interindividual variation suggests cautious interpretation

Background

- Most hospitalized children require an PIVC
- ~ 50% of all PIVC insertions fail on the first attempt
- 2/3 of all hospitalized children regard it as the most distressing experience
- Vein size and compliance affect the conditions for insertion
- Tourniquets are used to optimize these factors
- No previous studies in children

Methods

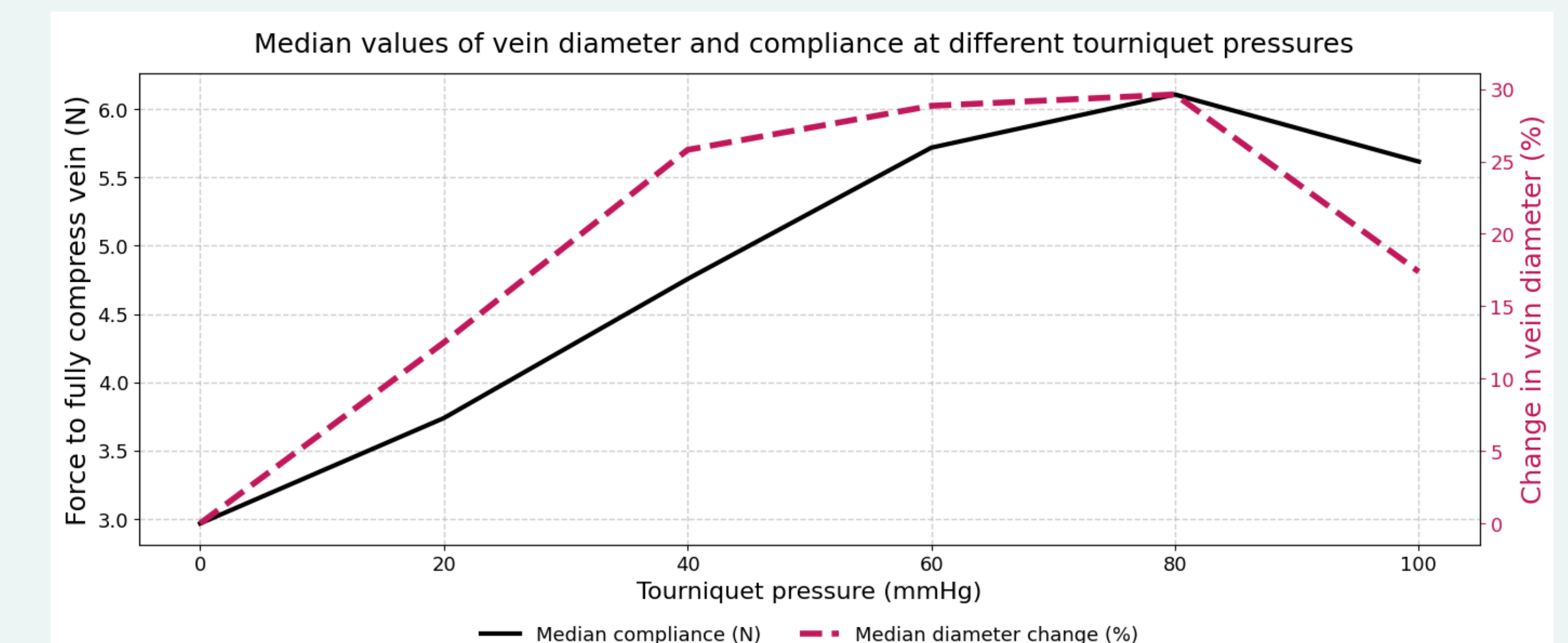
- 21 healthy children (6–10 years)
- Tourniquet pressures of 20–100 mmHg each applied for 60 seconds
- Vein diameter and compliance measured by ultrasound
- Novel pressure-sensing device developed with KTH Royal Institute of Technology



Picture from the data collection.
The pressure-sensing device is attached to the ultrasound transducer.

Results

- Both vein diameter and compliance changed significantly over time at all pressure levels
- Considerable interindividual variation was seen in the pressure and timing yielding optimal venous conditions



Group-level vein diameter change and venous compliance across different tourniquet pressures.



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