

Intraoperative Utility of Continuous Non-invasive Finger Arterial Pressure - A Feasibility Study in the Pediatric General Anesthesia Setting

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Introduction

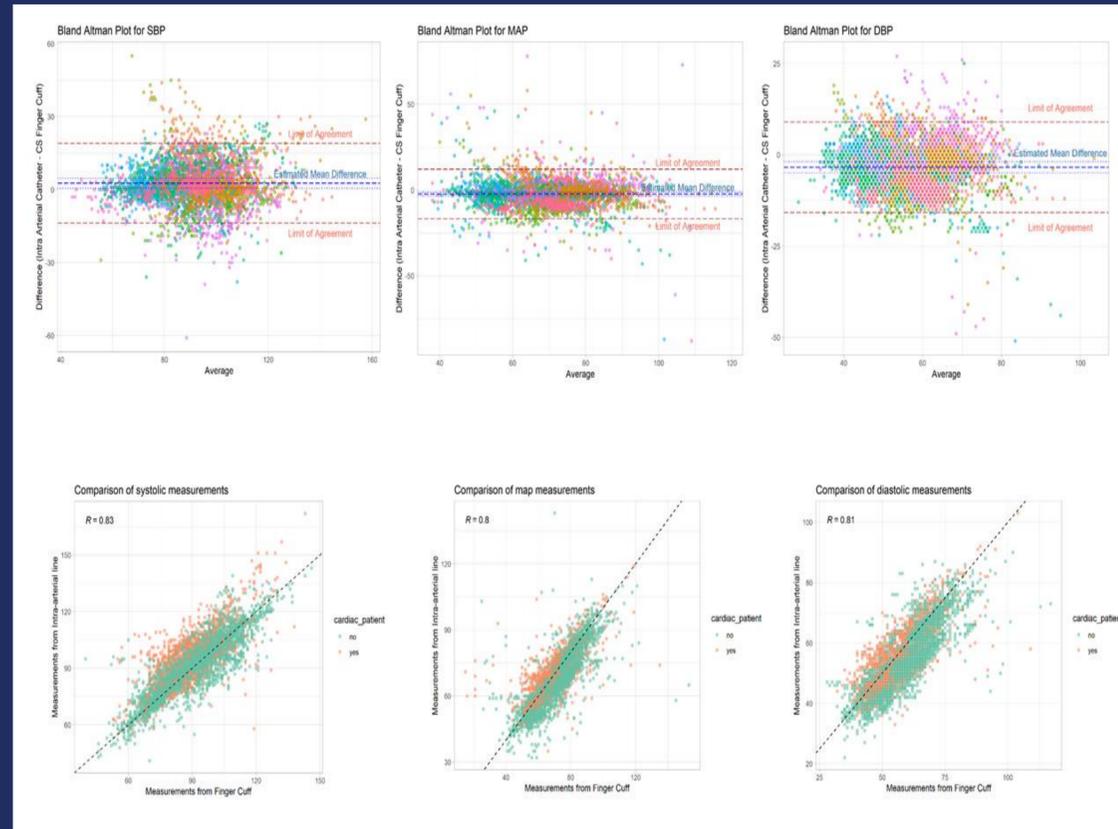
- Continuous arterial blood pressure monitoring is crucial in pediatric anesthesia
- Invasive arterial lines are the gold standard and have known complications and difficulty of placement in pediatric patients
- Non-invasive continuous finger arterial pressure (FAP) monitors are FDA approved for adults, but not for children
- Previous studies have not evaluated FAP devices for full anesthesia cases in pediatric patients
- Existing literature on pediatric patients evaluated very small periods of time; this does not give pediatric anesthesiologists feasibility data for the duration of an anesthetic care
- This study evaluated feasibility of a finger arterial pressure device for clinically reliable use in pediatric general anesthesia cases

Materials and Methods

- IRB approved study at Wolfson Children's Hospital, Jacksonville FL
- 25 patients, children's specialty hospital
- Age: 3 months – 17 years: Mean age: 6.5 years
- Anesthesia team education prior to study; data from FAP not used clinically
- Equipment: EV 1000 with ClearSight Cuff – Edward Lifesciences, Irvine CA
- Invasive arterial pressure at radial or femoral artery
- Measurement from each device recorded at 1 minute intervals for entire case in electronic medical record

Results

- 5271 Measurements from each monitor system
- Device Correlation R values: SBP: 0.83, MAP: 0.80, DBP:0.80
- Mean Difference Between Devices: SBP: 2.597 MAP: -2.437, DBP: -3.44
- P value for Mean Difference: SBP: 0.019 MAP: 0.001, DBP: <0.001



Top graphs- estimated bias with limits of agreement. Bottom graphs – linear association between invasive and FAP devices

Discussion

- FAP underestimated SBP compared to invasive arterial monitor with statistical significance
- FAP overestimated DBP and MAP compared to invasive arterial monitor with statistical significance
- FAP was clinically accurate with no mean difference greater than 3.5 mmHg; we conclude the small overestimation and underestimation that was noted is not clinically significant
- This study agrees with previous studies: FAP shows acceptable accuracy in infants and children
- Limitations: study required team member dedicated to set up and capture of data with FAP monitor- time consuming
- No pediatric sized cuffs currently for FAP machine that was used
- Because measurements were only recorded once per minute, acute changes may not have been captured
- This study points towards the feasibility of using the FAP devices for full anesthetic cases in pediatric patients
- Studies with greater patient numbers and FAP cuffs fitted for pediatric patients are needed

References

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