Furosemide Does Not Decrease Central Blood Volume in Hemodynamically Stable Pediatric Patients

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OBJECTIVE
To study the effect of furosemide infusion on cardiac index (CI), blood volume index (CBVI) and systemic vascular resistance index (SVRI) in PICU patients receiving diuresis.

STUDY
- 7 PICU patients (2 weeks to 17 years; 2.8-60 kg) with indwelling arterial and Central Venous catheters were infused with furosemide (0.5-1 mg/kg. 20 mg maximum).
- Ultrasound Flow/Dilution Measurements: Two to three discrete measurements were performed by injecting body temperature isotonic saline (1.0 ml/kg up to 30 ml) into the venous limb of an extracorporeal AV loop connected between indwelling arterial and venous catheters. A roller pump circulated blood (10–12 ml/min) from the artery to the vein.
- COstatus® measurements were performed before diuretic infusion and 30 and 60 minutes after infusion.
- Urine output was also measured.

RESULTS
- Urine output increased 3-4 times (mean: 3.4 cc/kg/hour)
- After furosemide infusion there was no statistically significant changes in CI, CBVI and SVRI, although there was a trend toward increased CI and CBVI.

STUDY’S CONCLUSIONS
- Despite brisk urine output, cardiac output and central blood volume did not decrease with furosemide. Cardiac index and central blood volume index seemed to increase with infusion.
- Cardiac function seemed to improve and central blood volume was preserved after furosemide infusion.
- Additional studies in more patients are needed to confirm these results.

TRANSONIC OBSERVATIONS
Reliable, non-invasive methods to measure cardiac output and blood volumes in pediatric ICU (PICU) patients are inadequate. Ultrasound dilution technology (COstatus®, Transonic Systems, Ithaca, NY) can measure hemodynamic parameters in PICU patients.

REFERENCES

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>PRE-FUROSEMIDE</th>
<th>30 MIN POST-FUROSEMIDE</th>
<th>P VALUE</th>
<th>60 MIN POST-FUROSEMIDE</th>
<th>P VALUE</th>
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<tbody>
<tr>
<td>CI ml/min</td>
<td>3.82 ± 0.26</td>
<td>3.99 ± 0.37</td>
<td>0.383</td>
<td>4.51 ± 0.63</td>
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<td>CBVI ml/kg</td>
<td>26.33 ± 2.49</td>
<td>29.14 ± 1.92</td>
<td>0.073</td>
<td>31.99 ± 4.35</td>
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<td>SVRI (dynes/cm5)/m2</td>
<td>1355 ± 138.41</td>
<td>1309.05 ± 118.11</td>
<td>0.609</td>
<td>1119.72 ± 124.32</td>
<td>0.424</td>
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