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Utilization of Angiotensin II for Catecholamine-Resistant Shock in Children: A Single Center Descriptive Case Series

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Purpose: Catecholamine-resistant shock (CRS) is associated with high rates of morbidity and mortality in children, and no evidence-based recommendations exist for management. Angiotensin II (Ang II) is a novel vasoactive agent for CRS that has been demonstrated to be efficacious in adults, particularly in those with acute kidney injury (AKI) and presumed reninangiotensin system (RAS) derangement as evidenced by increased serum renin. No data regarding the use of Ang II in children has been published. We aimed to describe the clinical characteristics and outcomes of children with CRS receiving Ang II.

Methods: We performed a single center (CCHMC) retrospective study of all children and young adults (0-25 years) who received Ang II for CRS from 01/2018-11/2022. Demographic, clinical and outcome data were assessed for each subject. Vasoactive inotropic scores (VIS) were examined pre- and post-initiation of Ang II to assess response to therapy.

Results: Among 20 patients, 19 (95%) had sepsis at initiation of Ang II, 18 (90%) had severe AKI, and 15 (75%) were requiring continuous renal replacement therapy (CRRT) (75%). Table 1 outlines clinical and outcome data. The median age was 10.2 years (range: 1 month-23 years). Median time from initiation of vasoactives to Ang II was 142 hours (IQR 18,350) and the median VIS at initiation was 64 (IQR 38,90). Median duration of Ang II therapy was 26.9 hours (IQR 4,73), with a decrease in VIS noted at 6 hours (-24.4%, IQR [-46,-1.4]) and at discontinuation (-19.6%, IQR [-82,14.4]). Subjects who initiated Ang II earlier (before median 142 hours) had greater decrease in VIS by discontinuation compared to those who started later (-50% [IQR -90, 4.5] vs. -3.7% [-46%,119%], p=0.15). 8 subjects had renin levels sent prior to initiation (median 3527 pg/ml, range: 918-6000). 16 (70%) suffered ICU mortality; those who died started Ang II later than those who survived (median time to Ang II 161 hours [IQR 28.9-387] vs. 109 hours [IQR 5.7-276], p=0.36).

Conclusions: Ang II appears to reduce vasoactive burden in children with refractory CRS, though outcomes remain poor. In this cohort, Ang II was initiated late in vasoactive course, and commonly in children with severe AKI and evidence of RAS derangement by serum renin. It appears earlier initiation of Ang II may be beneficial, and further study is needed to determine when and in whom its use is warranted

Biography

Oguzhan Tezel, he is a senior pediatric residency student in Marmara University Medical School Pediatrics Department, Turkey. He has been in Cincinnati Children's Hospital Medical Center critical care nephrology department, and He has done this study with my mentors there. He certain that sharing this study with his colleagues will be beneficial for everybody. He is planning to continue his training and following fellowship in USA preferably in CCHMC

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