

Category : **Renal: failure**

A149 - Renin kinetics in cardiac surgery patients with postoperative administration of angiotensin-II

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Introduction:

Hyperreninemia after cardiac surgery may contribute to the development of acute kidney injury (AKI). [1] Through biofeedback, Angiotensin-II (AT-II) may potentially attenuate hyperreninemia, whilst maintaining target mean arterial blood pressure (MAP >65mmHg). This trial assesses the association between administration of AT-II and plasma renin levels in cardiac surgery patients with postoperative vasoplegia and hyperreninemia.

Methods:

A cohort of 40 patients after cardiopulmonary bypass (CPB) and high D-renin levels (baseline vs. 4h after CPB, cut-off >3.7µU/ml, [1]) received vasopressor therapy with either norepinephrine (NE) and AT-II or standalone NE. The primary outcome was the renin plasma level at 12h after surgery, adjusted by baseline renin plasma level at 4h after surgery.

Results:

Overall, the median renin plasma concentration increased from a median baseline (quartiles) of 44.3µU/ml (14.6, 155.5) to 188.6µU/ml (29.8, 379.0) 4h after CPB. Patients with high D-renin were then treated with either NE alone [median (quartiles) dose of 3.25mg (1.00, 4.75)] or with NE with additional AT-II [NE dose: 1.33mg (0.78, 2.04)]; [AT-II dose: 0.34mg (0.29, 0.78)]. At 12h after surgery, renin levels were lower in patients who received AT-II, compared to patients that did not receive AT-II 71.7µU/ml (21.9, 211.4) vs. 130.6µU/ml (62.9, 317.0; P=0.034 adjusted for baseline renin plasma level at 4h after surgery). AT-II effects on renin levels were particularly pronounced in patients without ACEi or ARB premedication. Finally, AT-II significantly decreased the dose of NE required to maintain the target MAP.

Conclusion:

In cardiac surgery patients with post-OP vasoplegia and high D-renin levels, AT-II reduced renin plasma levels at 12h compared to NE alone, which was associated with increased renin levels. Furthermore, AT-II significantly decreased the NE dose required to maintain target MAP.

References:

[1] Küllmar M et al. Am J Resp Crit Care Med. 203(9):1119-26, 2021.

Table:

Renin	Total (n=40)	AT-II (n=20)	No AT-II (n=20)	p-value
Pre-OP levels, median (Q1, Q3), µU/ml	44 (15, 156)	45 (9, 156)	44 (17, 231)	0.745
Levels 4h post-OP, median (Q1, Q3), µU/ml	189 (30, 379)	214 (28, 461)	126 (33, 353)	0.457
Levels 12h post-OP, median (Q1, Q3), µU/ml	107 (32, 291)	72 (22, 221)	131 (63, 317)	0.213
Change, median (Q1, Q3), % (12h/4h post-OP)		-48 (-73, 40)	+14 (-42, 131)	0.023
Predicted 12h levels adjusted by 4h levels post-OP		55.7	118.0	0.034

Change without prior ACEi/ARBs premedication, %	-52 (-74, -10)	+45 (-38, 147)	0.028
Change with prior ACEi/ARBs premedication, %	-53 (-78, 84)	-8 (-46, 61)	0.336

Renin characteristics, AT-II, angiotensin-II; ACEi = angiotensin converting enzyme inhibitors; ARB = angiotensin receptor blockers