Introduction:
Vasoplegia is commonly observed after cardiopulmonary bypass surgery (CPB) and associated with high mortality. Chronic use of renin-angiotensin aldosterone system inhibitors (RAASi) is associated with its incidence and ensuing need for vasopressor support after CPB. Renin serves as marker of tissue perfusion. We examined the role of renin in the setting of RAASi exposure and vasopressor needs in the peri-CPB period.

Methods:
Prospective observational study of 31 adult patients undergoing CPB, aged 66.0±10.5 years (22 men, 9 women). Blood was collected 1) post induction, pre-CPB; 2) 30 min post cardioplegia, and 3) immediately post bypass. Vital signs and perioperative medications were recorded. As control, blood was collected from 5 men and 4 women aged 53.5±10.7, not diagnosed with lung disease and not prescribed any RAASi.

Results:
Baseline plasma renin in CPB patients tended to be higher than in control subjects (mean=38.5pg/ml±9.2 vs. 17.1 pg/ml±3.5, respectively, p=0.670). 30 minutes into CPB, mean renin was increased from baseline (77.6 pg/ml±17.5, p=0.211), and remained elevated immediately post CPB (74.6 pg/ml±19.1). Patients using RAASi prior to CPB tended to have a larger increase in renin post CPB (delta=55.3pg/ml±30.9) vs. those not previously on RAASi (26.9 pg/ml±9.5, p=0.092). Renin was elevated in patients requiring vasopressor support in the 24 hours post CPB vs. those not requiring pressors (41.4 pg/ml±15.7 vs. 25.1 pg/ml±16.1 p=0.0246). In those prescribed RAASi and requiring pressors post CPB, there was a tendency toward greater renin increase than those not requiring pressors postoperatively (49.9 pg/ml±49.7 vs. 8.5 pg/ml±3.9, p=0.036).

Conclusion:
This study suggests a trend toward higher renin levels, particularly during CPB, in patients prescribed RAASi, and a positive association between renin and postoperative vasopressor needs. We speculate that increased renin levels may predict postoperative vasoplegia.

References:
1. Gleeson, PJ et al. Critical Care Medicine, 47;2:152-158, 2019