Improvement in echocardiographic and biomarkers after glucocorticoid therapy in infants with pulmonary hypertension

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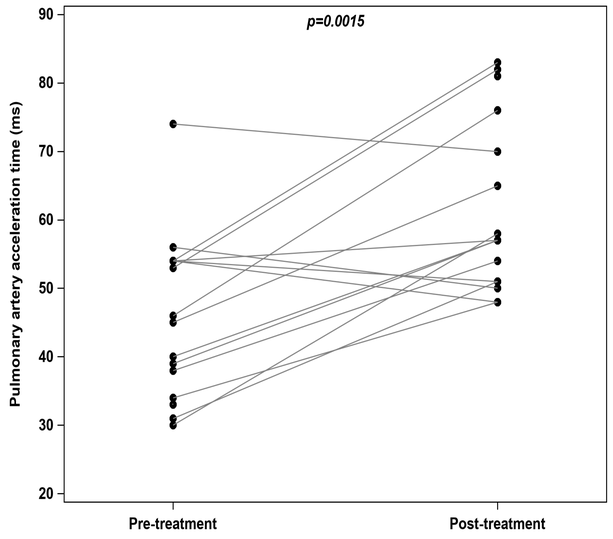
Background

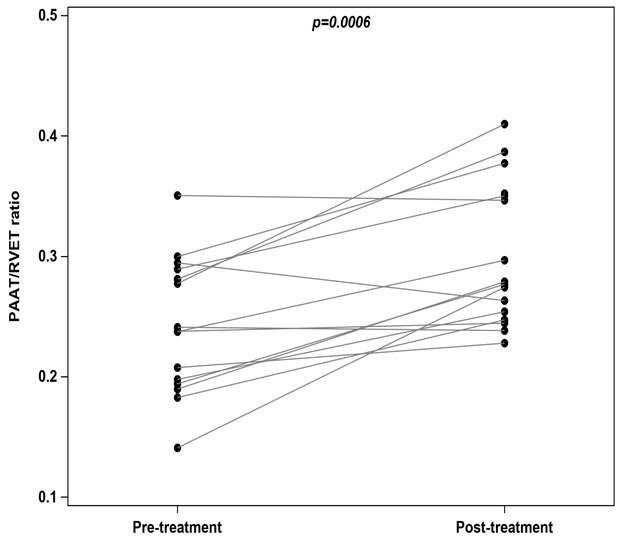
- Pulmonary hypertension (PH) in children is often associated with significant morbidity and mortality.
- Data in animal and human studies have shown the important role inflammation may have in the pathogenesis of PH.
- Limited evidence exists on the utilization of anti-inflammatory treatment in PH management.
- We assessed the effect of treating PH in infants with glucocorticoids using echocardiographic changes and diagnostic biomarkers as measures of efficacy.

Materials & Methods

- Retrospective chart review at St. Louis Children's Hospital.
- Hospitalized infants <1 year of age with no significant intracardiac shunt
- 12 (70%) WHO Group 3 PH and 5 (30%) WHO Group 1 PH.
- 5-7 day course of systemic glucocorticoid treatment from January 1, 2017 to December 31, 2021.
- Quantitative echocardiographic indices for PH, N-terminal prohormone brain natriuretic peptide (NT-proBNP) or BNP levels were collected pre & post glucocorticoid treatment.

Results





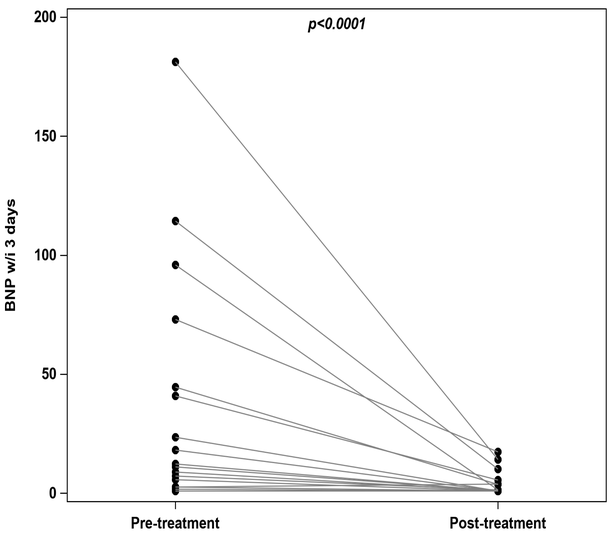


Table 2. Comparison of continuous clinical factors between pre and post-treatment

Factor	N[a]	Pre-treatment	Post-treatment	Difference[b]	p-value
BNP, median (IQR)	17	12.3 (5.7, 44.7)	1.1 (1.0, 3.8)	-11.3 (-41.0, -4.7)	<0.0001[c]
PCO2, mean ± SD	12	56.7 ± 15.7	52.8 ± 10.9	-3.8 ± 12.7	0.3197[d]
EI, mean ± SD	17	1.49 ± 0.31	1.31 ± 0.27	-0.18 ± 0.35	0.0546[d]
TAPSE, mean ± SD	16	0.53 ± 0.18	0.67 ± 0.30	0.14 ± 0.29	0.0743[d]
PAAT, mean ± SD	15	46.8 ± 11.8	60.5 ± 12.0	13.7 ± 13.5	0.0015[d]
RVET, mean ± SD	15	196.1 ± 36.4	203.9 ± 21.0	7.8 ± 38.3	0.4430[d]
PAAT/RVET, mean ± SD	15	0.24 ± 0.06	0.30 ± 0.06	0.06 ± 0.05	0.0006[d]

[a]N is the number of subjects in the analysis. The subjects with both pre and post data were included in the analysis.
[b]Difference was calculated by post data minus pre data.
[c]P-value was associated with Wilcoxon signed rank test.
[d]P-value was associated with paired t-test
BNP (B-type natriuretic peptide), PCO2 (partial pressure carbon dioxide), EI (eccentricity index), TAPSE (Tricuspid annular plane systolic excursion), PAAT (pulmonary artery acceleration time), RVET (right ventricular ejection time)

Conclusions

- In this retrospective study, systemic glucocorticoid therapy was associated with significant improvement in BNP levels, PAAT, and PAAT/RVET ratio in infants with WHO Group 1 and 3 PH.
- These results provide impetus for further prospective studies to determine how glucocorticoids may provide benefit to this population of affected children.