



POSTER PRESENTATION

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# Association of neutrophil gelatinase-associated lipocalin (NGAL) and blood pressure in children with Henoch Schönlein Purpura

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## Purpose

Renal disease often occurs with Henoch Schönlein Purpura (HSP). NGAL is a non-invasive, urinary biomarker that is predictive of renal flares in SLE1 and associated with elevated SBP and DBP in subjects with preeclampsia<sup>2</sup> or early atherosclerosis<sup>3</sup>. We hypothesized that elevated NGAL is associated with elevated BP and proteinuria in children with HSP.

## Methods

We conducted a 6-month prospective cohort study of subjects <18 years who were evaluated for new-onset HSP between February 2009 and June 2010. Weight, height, and casual BP were recorded at 0-7, 60 and 180 days and first-morning urine samples were collected at 0-7, 14, 28, 60, and 180 days after diagnosis. Twenty-four-hour ABPM was completed 6 months after diagnosis. BP measurements were standardized using body mass index and BP Z-scores (casual) and BP index (ABPM). Mixed effects regression models with pre-specified individual level covariates (age and gender) as fixed effects and subject as a random effect were used to examine the relationship between urinary NGAL and the following: 1) casual SBP and DBP over time, 2) ABPM at 6 months after diagnosis, and 3) urine protein to creatinine ratio over time.

## Results

21 subjects with new-onset HSP were enrolled in the cohort. Median age was 5 years (IQR: 4, 8). Fifty-two percent of subjects were male. Sixty-three percent and 16% had a urine protein to creatinine ratio >0.2 and >0.5, respectively, during the study. Thirteen percent and 13%

had 24-hour SBP or DBP >95th% on ABPM. Thirty-six percent, 7%, and 36% had abnormal systolic, diastolic, and MAP nocturnal dipping on ABPM, respectively. Thirty-seven percent and 26% had standardized casual SBP and DBP >95th% during the study. Urinary NGAL on the log-scale was not significantly associated with casual SBP over time, ABPM SBP or DBP, or the urine protein to creatinine ratio. Increased urinary NGAL levels on the log-scale were significantly associated with increased casual DBP over time (coefficient: 3.7, 95% CI: 1.8, 5.7) and abnormal nocturnal systolic dipping (coefficient -1.68, 95% CI: -3.05, -0.32). Increased urinary NGAL was also associated with abnormal nocturnal diastolic and MAP dipping, albeit statistically insignificant.

## Conclusion

In this pilot investigation of the relationship between urinary NGAL and BP and proteinuria in children with HSP, in a relative small sample of patients we found a significant association between 1) urinary NGAL and DBP over time, and 2) urinary NGAL and abnormal nocturnal dipping using 24-hour ABPM 6 months after diagnosis. Larger investigations and investigations over more time are needed to better define the relationship of NGAL with both BP and other renal outcomes in children with HSP.

## Disclosure

Pamela Weiss: None; Andrew J. Klink: None; Kevin Meyers: None; Russell Localio: None; Mary B. Leonard: None; Chris Feudtner: None.

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