

Vesicoureteral reflux in newborn boys with Posterior Urethral Valves is associated with lower serum creatinine nadir in the first year of life, suggesting decreased baseline functional renal mass



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Disclosures

- None

Background

- Posterior Urethral Valves (PUV) remains a frequent cause of pediatric End Stage Renal Disease (ESRD)
- Prior research identified serum nadir creatinine in the first year of life (SNC1) as a leading predictor of early and late progression to ESRD
- Given that SNC1 represents the lowest value of creatinine a child experiences in early life, it is thought to reflect baseline functional renal mass
- Vesicoureteral Reflux (VUR) on initial Voiding Cystourethrogram (VCUG) has been identified as a possible risk for ESRD
 - Abnormal nephrogenesis vs. recurrent kidney infection risk?

Aim

- We aimed to investigate the association between VUR status, pre- and post-valve ablation in newborns with PUV and functional renal mass, estimated by SNC1

Methods

- Clinical data was extracted from the Pediatric Urology Midwest Alliance (PUMA) multi-institutional PUV cohort
- The total cohort is comprised of 274 patients born between 1995 and 2015 with the diagnosis of PUV confirmed on VCUG or cystoscopy in the first 3 months of life
- Only boys initially treated with cystoscopic valve ablation, who underwent pre- and post-valve ablation VCUG and for which SNC1 data was available were included

Results

	N	%
Patients	177	100.0
VUR at diagnosis		
No	70	39.6
Yes	107	60.5
VUR laterality at diagnosis (n=107)		
Unilateral	51	47.7
Bilateral	52	48.6
Unknown	4	3.7
Worst degree of VUR at diagnosis (n=107)		
Non dilating (grades 1-2)	5	4.7
Dilating (grades 3-5)	98	91.6
Unknown	4	3.7
VUR downgraded or resolved after resection (n=107)		
Yes	29	27.1
No	77	72.0
Unknown	1	0.9

Results

		Nadir SCN1		
VUR at diagnosis	N	Mean	P (Wilcoxon)	
Yes	107	0.5	0.002	
No	70	0.3	Reference	
VUR laterality at diagnosis			Pairwise P-values	
Bilateral	52	0.6	0.88	
Unilateral	51	0.5	Reference	
Worst degree of VUR at diagnosis			Pairwise P-values	
Dilating (grades 3-5)	98	0.5	0.01	1.00
Non dilating (grades 1-2)	5	0.4	0.61	Reference
No VUR at diagnosis	70	0.3	Reference	0.61
VUR downgraded or resolved after resection			Pairwise P-values	
No	77	0.6	0.70	
Yes	29	0.5	Reference	

Conclusions

- This study confirms the relationship between grades 3-5 VUR on pre-valve ablation VCUG in children with PUV and increased SNC1
- SNC1 is a surrogate for functional renal mass at birth, and has shown to be highly predictive of ESRD progression risk
- Further research is necessary to investigate the mechanism by which early high grade VUR influences nephrogenesis and determine if continued VUR throughout childhood provides additive risk for ESRD