KSN 2021
FULLY VIRTUAL MEETING
September 02 (Thu) - 05 (Sun)

Abstract Submission No. : 2184

Assessment of decision making ability of Ultrasonography for conducting Micturating Cystourethrogram in children with Urinary tract infection

Saumil Gaur, Rani KN, Jyoti Singh, Mounika Motamarri, Partha Pratim Paul, Kishore Phadke
Department of Pediatric Nephrology, Rainbow Children's Hospital, Bangalore, India

Objectives: Assess the decision making ability of Ultrasonography (USG) to conduct Micturating Cystourethrography (MCUG) by evaluating sensitivity, specificity and predictive values in children with complicated urinary tract infection(UTI) and determine the prevalence of vesicoureteral reflux (VUR)

Methods: Prospective analytical study in children below 12 years of age with complicated and recurrent UTI requiring hospitalisation between April 2018 to December 2020. Abnormal USG findings like pelvicalyceal/ureteral dilatation, hypoechoic renal echotexture, edematous kidneys and focal nephronia were correlated statistically with gold standard MCUG.

Results: Prevalence of VUR is 35% in 685 subjects who underwent MCUG. 597 subjects with both MCUG and USG at our centre were analysed for correlation among both. Among children below 1 year, USG has sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) of 61.5%, 44.1%, 33.3%, 61.7% respectively ; among 1-5 years the sensitivity, specificity, PPV, NPV of 56.6%, 40%, 41.8%, 54.7% respectively and > 5 years sensitivity , specificity ,PPV,NPV 80%, 41.5%, 40%, 80.9% respectively. All age groups combined Sensitivity is 60.9%, low Specificity of 42.4%, significantly lower Positive predictive and Negative predictive values of 37.3% and 65.9% respectively with meagre diagnostic accuracy of 49.1%. Assessment of strength of agreement between both modalities was AUC = 0.51 suggesting failed agreement and Spearman's correlation revealed a *rho* value of 0.03 inferring a very weak correlation

Conclusions: Ultrasonography has diminished statistical significance as a decision making tool for ordering MCUG in children with UTI. The lack of correlation is evident among all age groups hence the suggestion of current guidelines on conducting MCUG based on USG needs revaluation. Owing to higher prevalence of VUR (1 in 3 children with UTI) MCU can be considered irrespective of normal / abnormal USG findings

Sensitivity & Specificity Analysis for estimating the accuracy of USG findings as compared to MCU diagnosis in detecting VUR

Sensitivity & Specificity Analysis for estimating the accuracy of USG findings as compared to MCU diagnosis in detecting VUR

AGE	SENSITIVITY	SPECIFICITY	PPV	NPV	ACCURACY	AUC
0-12YEARS (Total)	**60.9% (Total)**	**42.4% (Total)**	**37.3% (Total)**	**65.9% (Total)**	**49.1% (Total)**	**0.51 (Total)**
<1YEAR	61.5%	44.1%	33.3%	61.7%	49.5%	0.53
1-5YEARS	56.6%	40%	41.8%	54.7%	47.2%	0.47
>5 YEARS	80%	41.5%	40%	80.9%	54.1%	0.61

PPV- positive predictive value, NPV- negative predictive value, AUC- area under curveA guide for classifying the accuracy of a diagnostic test is the traditional academic point system:

.90-1 = excellent (A) , .80-.90 = good (B) , .70-.80 = fair (C) ,.60-.70 = poor (D) , .50-.60 = fail (F).

Spearman's correlation test to assess the relationship between USB and presence of VUR and ROC curve

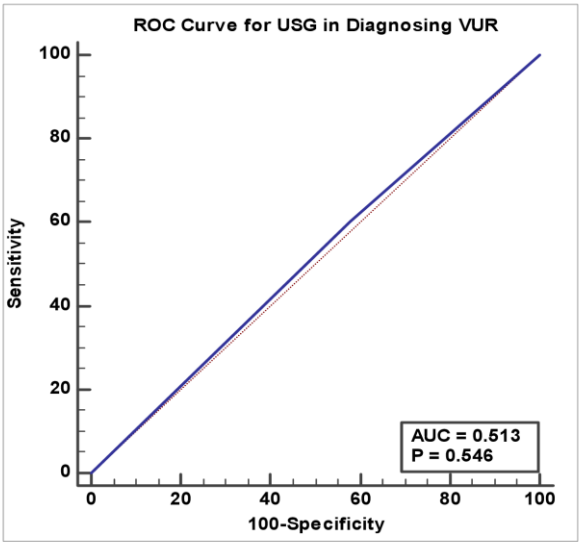
Spearman's correlation test to assess the relationship between USB and presence of VUR (rho Value = 0.31)			
USG	VUR		Total
	Present	Absent	
APD 5-10 mm	40	89	129
APD >10 mm	53	68	121
Others	34	60	94
Normal	88	165	253
Total	215	382	597

The correlation coefficients are denoted by 'rho'

Correlation coefficient range

0.0 - No Correlation ,0.01 - 0.20 - Very Weak Correlation , 0.21 - 0.40 - Weak Correlation ,0.41 - 0.60 - Moderate Correlation

0.61 - 0.80 - Strong Correlation , 0.81 - 1.00 - Very Strong Correlation



Area Under Curve	Std. Error	P-Value	95% Cl	
			Lower	Upper
0.51	0.03	0.55	0.47	0.58