ORIGINAL ARTICLE

Accuracy of Intra Renal Arterial Doppler Duplex Ultrasonography in Obstructive Uropathy by Comparing With IVU

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ABSTRACT

Aim: To determine accuracy of intrarenal arterial Doppler duplex ultrasonography in obstructive uropathy by comparing with IVU.

Methods: This cross sectional study was conducted on 79 patients from July 2012 to December 2012 of both genders with age ranging from 20 to 70 years and in whom pain alone or pain with oliguria, haematuria, urgency and frequency are the major complaints at Department of Radiology, Shaikh Zayed Hospital Lahore Then colour flow Doppler to detect the presence or absence of urinary obstruction. A RI of >0.70 was considered as suggestive of obstruction. All patients were prepared two days prior to IVU by administering laxatives. X ray KUB was performed initially to know about the preparation, exposure and any radio-opaque density if present taken after by infusing Sodium ditrizoate intravenously in a measurement of 1ml/kg body weight.

Results: There were 68.4% male and 31.6% female patients with mean age was 44.7±12.4 years. The sensitivity of Doppler Duplex ultrasonography by taking IVU finding as gold standard was 85%, specificity 69% and diagnostic accuracy was 81%. The positive predictive value of Doppler Duplex ultrasonography by taking IVU finding as gold standard was 87% and negative predictive value was 65%.

Conclusion: Use of duplex Doppler sonography improved the specificity, and thus the accuracy, of sonography in the diagnosis of obstruction uropathy.

Keywords: Obstructive uropathy, Doppler Duplex ultrasonography, intravenous urography, sensitivity

INTRODUCTION

Intense obstructive uropathy is a usually experienced condition, in intense block, the weights inside the gathering framework and ureters over the purpose of check can increment drastically prompting dynamic renal disability despite proceeded with impediment. Obstructive Uropathy is a genuine urological crisis. Upper urinary tract check when it is two-sided or in singular working kidney can prompt renal impedance**[1].**

Excretory urography, is a tedious, exorbitant and intrusive examination with reactions contraindicated in specific conditions i.e. pregnancy, differentiate affectability, renal disappointment, and so forth. Duplex Doppler sonography is proposed in situations where intravenous urography is contraindicated. Intrarenal Doppler ultrasonography speaks to a touchy and exceptionally particular test that can fundamentally add to the determination of deterrent in patients with intense renal colic. It ought to be utilized as the principal line imaging strategy in presumed intense renal colic, and for patients with renal inadequacy, pregnant ladies or for patients with antagonistic responses to differentiate media[2].

The intrarenal resistive file is a physiological parameter that in a roundabout way mirrors the level of protection in the intrarenal vasculature. Resistive record estimations have been pushed for the demonstrative assessment of a few renal pathologies, including obstructive uropathy[3].

Urinary tract block brings about expanded intrarenal vascular protection and that vascular protection falls following the arrival of deterrent. DDUSG permits the assurance of this intrarenal RI. Creature ponders have demonstrated that renal impediment changes the renal blood vessel waveform. DDUSG is helpful for distinguishing these progressions in light of the fact that expanded vascular protection brings about more stamped diminishment in diastolic stream than in systolic stream. Duplex Doppler hence separates amongst obstructive and non-obstructive uropathy[4]. Intrarenal RI differs specifically with changes in renal vascular resistance.**[5]** Intrarenal RI of 0.70 to be a decent biased level for obstacle, bringing about an affectability of 92%**[6].**

METHODOLOGY

This cross sectional study was conducted on 79 patients from July 2012 to December 2012 of both genders with age ranging from 20 to 70 years and in whom have only pain or pain with oliguria, haematuria, urgency and frequency are the main complaints at Department of Radiology, Shaikh Zayed Hospital Lahore Then colour flow Doppler to detect the presence or absence of urinary obstruction. A RI of >0.70 was considered as suggestive of block. All patients were readied two days before IVU by regulating intestinal medicines. X beam KUB was performed at first to think about the arrangement, presentation and any radio-hazy thickness if exhibit took after by infusing Sodium ditrizoate intravenously in a measurements of 1ml/kg body weight. Post-differentiate films were taken instantly and afterward at 5, 15 and 30-minute interims.

RESULTS

There were 68.4% male and 31.6% female patients with mean age was 44.7±12.4 years. In the comparison of Doppler Duplex ultrasonography versus IVU finding for obstructive uropathy, there were 70 (61.4%) patients true

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positive, 10(8.8%) patients false positive, 12(10.5%) patients false negative and 22(19.3%) patients true negative. The sensitivity of Doppler Duplex ultrasonography by taken IVU finding as gold standard was 85%, specificity 69%, positive predictive value was 87%, negative predictive value was 65% and diagnostic accuracy was 81% (Table 1).

Table 1: Comparison of Doppler Duplex ultrasonography versus IVU finding for obstructive uropathy

Doppler duplex USG	**IVU finding (Gold Standard)**		**Total**
	Positive	**Negative**	
Positive	70 (TP)	10 (FP)	80
Negative	12 (FN)	22 (TN)	34
Total	82	32	114

Sensitivity	85%
Specificity	69%
Positive predictive value	87%
Negative predictive value	65%
Diagnostic accuracy	81%

DISCUSSION

Earlier reports have shown that sonography is sensitive (≥90%), but not specific (65-84**%,** depending on patient population), in the diagnosis of renal obstruction[7-14]**.** When pyelocaliectasis is identified, further studies often are needed to establish the presence of obstruction. The results of this and our earlier study suggest that duplex Doppler sonography is a valuable noninvasive aid for distinguishing obstructive from nonobstructive dilatation of the renal collecting system[14].

Animal studies that used direct pressure measurements have shown that renal obstruction causes an increase in renal vascular resistance that falls after release of the obstruction[15]. In a small group of patients, we previously found that renal obstruction elevated the resistive index, which fell after relief of the obstruction[16]. However, the relatively small number of patients limited our ability to establish reliable Doppler criteria for distinguishing the obstructed from the non-obstructed, dilated renal collecting system. In addition, our previous report did not include normal patients or patients with medical diseases of the kidney, so the limitations of duplex Doppler analysis could not be determined[16,17]**.**

In present study the mean age was 44.7±12.4 years. While mean age in the study of Ashraf et al[18] was 40 years, that is comparable with present study.

In our study 68.4% male and 31.6% female patients. As compared by Ashraf et al[18] 70.4% male and 29.6% female patients, that is compared with our study.

In present study the sensitivity of Doppler Duplex ultrasonography in obstructive uropathy was 85%, specificity, 69% and diagnostic accuracy 81%. As compared with the study of Ashraf et al[18] the sensitivity of Doppler Duplex ultrasonography in obstructive uropathy was 87.5%, specificity 85% and diagnostic accuracy 90%, which is comparable with our study.

In other study conducted by Platt et al[6] the sensitivity of Doppler Duplex ultrasonography in obstructive uropathy was 92%, specificity 88% and diagnostic accuracy 90%, which is also comparable with our study.

CONCLUSION

The use of duplex Doppler sonography improved the specificity, and thus the accuracy, of sonography in the diagnosis of obstruction uropathy.

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