ABSTRACT

AIM:

- To evaluate the diagnostic utility of intrarenal arterial Doppler study in ureteric obstruction.
- To compare intrarenal arterial doppler in patients with obstructed and non obstructed kidneys.

MATERIALS AND METHODS:

Prospective study of 54 patients presenting to the emergency medical division within 24 hrs of onset of symptoms of unilateral acute renal colic. The kidney on the side of obstruction was treated as the case kidney and the contralateral normal(unobstructed) kidney served as the control.

- All patients will undergo ultrasonography and Doppler ultrasonography using 2-5 mHz convex probe.
- Presence or absence of pelvicalyceal system dilatation will be assessed in each kidney on the gray-scale images.
- At least three Doppler spectra will be obtained from interlobar arteries along the border of the medullary pyramids and their mean will be taken.
- The Doppler sample width will be set at 2-5 mm.
- The renal RI will be calculated as follows:

\[ \text{RI} = \frac{\text{peak systolic velocity} - \text{end diastolic velocity}}{\text{peak systolic velocity}} \]

- The RI difference (delta RI) will be determined as the difference in RI of the corresponding and contralateral kidney.

- Mean RI value will be calculated for each kidney.

- RI of 0.70 is the upper limit of normal intrarenal resistance.

- The mean Resistivity Index (RI) in obstructed kidneys will be measured and compared with the normal kidney.

- Obstruction will be confirmed with ultrasound. If ultrasonography is equivocal CT scan will be done for confirmation of obstruction.

- The site of obstruction will be considered to be proximal, if it is up to or proximal to the L3 vertebral level and distal, if beyond.

**RESULTS:**

Resistivity Index (RI) in segmental arteries of all the 54 patients with obstructed kidney was significantly higher than in unobstructed kidney (0.75 vs 0.56; \( p < 0.001 \)) with a sensitivity of 85% and specificity of 93%.
CONCLUSIONS:

We conclude that Doppler ultrasound is a useful diagnostic tool in evaluation of acute renal obstruction, thus avoiding unnecessary CT and minimizing the exposure of patients to ionizing radiation. RI value > 0.7 have a very high level of specificity and sensitivity in our study. The results obtained in the study were comparable to pioneer studies conducted worldwide.