

“THE ROLE OF CT PERFUSION IN THE CHARACTERISATION OF SOLITARY RENAL LESIONS – AN ADDED VALUE TO MULTIPHASIC CT”

ABSTRACT

INTRODUCTION:

Although imaging by CT and MRI for detection and evaluation of renal lesions has increased in recent years, the accuracy rate on preoperative characterisation of their nature remains low. CT perfusion allows a quantitative evaluation of tissue perfusion and may aid in renal lesion characterisation, differentiating benign and malignant lesions and in subtyping of renal cell carcinomas.

AIM AND OBJECTIVES:

- 1) To acquire CT perfusion parameters within the renal lesion and in the normal renal parenchyma.
- 2) To study the differences among the CT perfusion parameters obtained from various renal lesions and to correlate with the histopathological diagnosis, and grading.
- 3) To find out the sensitivity and specificity of the CT perfusion parameters that can be used to differentiate malignant tumours like renal cell carcinoma from other benign tumours of the kidney.

MATERIALS AND METHODS:

- 1) STUDY DESIGN : Prospective observational study.
- 2) SAMPLE SIZE: 40 cases
- 3) METHODS:

This study was carried from January 2017 – June 2017 in Rajiv Gandhi Government General Hospital. Patients diagnosed as having renal lesion were subjected to CT perfusion studies, done using 16 SLICE CT scanner (SOMATOM EMOTION, SIEMENS HEALTHINEERS). Various CT perfusion parameters namely, Blood flow(BF), Blood volume(BV), Permeability(PMB) were obtained from renal lesion and in the normal renal cortex.

RESULTS:

Out of the 40 renal lesions, 32 were RCCs (80%), 5 were Oncocytomas (13%), and 3 were AML with minimal fat(7%). Significant differences existed between RCC and Oncocytoma in all three parameters (BF, BV, PMB). Angiomyolipoma and Oncocytoma showed significant differences in BV and PMB. Significant differences were found in both BF and BV between clear cell RCC and AML, whereas significant difference was seen only in BF values between other subtypes of RCC and AML. There were significant differences noted in BF, BV and PMB values between subtypes of RCC. BF and BV values were found to be significantly higher in High grade RCC than low grade RCC. Permeability was found to be most helpful in differentiating between RCC and oncocytoma with sensitivity of 93.8% and specificity of 100%.

CONCLUSION:

This study showed the feasibility of CT Perfusion in discriminating between the malignant from benign renal lesions, and also in subtyping which can aid in further management.

KEY WORDS:

CT Perfusion, Renal cell carcinoma, Oncocytoma, Angiomyolipoma, Blood Flow, Blood Volume, Permeability