“ANALYSIS OF MULTIPARAMETRIC MRI DATA IN PROSTATIC CARCINOMA- PI-RADS AND CORRELATION WITH GLEASON SCORE IN A 3T MRI”

Introduction:

Carcinoma of prostate is one of the leading causes of cancer death among aged men. Most of the prostate cancers are slow-growing and indolent rather than being aggressive. Hence, early diagnosis of prostate cancer can lead to improved treatment outcomes. MP-MRI aids in pre-biopsy diagnosis of cancer prostate. It also helps in characterizing the extent of disease involvement which can aid in minimally-invasive procedures.

Aim & Objectives:

Aim

- To evaluate the efficacy of Multiparametric MRI as a noninvasive investigation in detection of carcinoma prostate in patients with raised PSA level and to correlate PI-RADS with Gleason’s score.

Objectives

- To correlate apparent diffusion coefficient (ADC) values with Gleason’s score of prostate cancer.
- To determine mean ADC values for low risk (Gleason’s score <6), intermediate risk (Gleason’s score = 7) and high risk (Gleason’s score >7) prostate cancer.

Materials & Methods:

Study design: Prospective observational study.

Sample size: 25 males, age between 50 and 78 years with raised PSA levels.

Methods: All 25 patients were subjected for the MP-MRI sequences. The machine used in this study is SIEMENS 3.0 Tesla MRI (Skyra, Erlangen Germany). The prostate imaging-reporting and data system (PI-RADS) scoring involves 4 components- T2w-MRI, DWI-MRI, DCE-MRI and MR spectroscopy to classify the risk of malignancy. The total score is 20. Gleason’s score was obtained by histopathologic analysis.
Results:

According to MP-MRI based PI-RADS scoring, 44% of patients had highly suspicious malignancy, 44% had probably malignant lesion while 12% had indeterminate lesions. Out of 25 patients subjected for TRUS biopsy, 6 patients reported a Gleason score of 6, 8 reported a Gleason score of 7 and 11 patients reported a Gleason score of 8 & above indicating in favor of Malignancy. There was a positive linear correlation between PIRADS and Gleason score (+0.790), p value <0.001. There was a significant negative correlation between mean tumor ADC values and Gleason’s score, – 0.912, p value <0.001.

Conclusion:

Based on the findings of this study, it can be concluded that there is a significant positive correlation between PI-RADS and Gleason’s score & a negative correlation between mean tumor ADC value and Gleason’s score. Thereby, PI-RADS can non-invasively assess the aggressiveness of prostate cancer. Also, the mean tumor ADC value could differentiate between low, intermediate and high grade tumors. Thus incorporation of ADC values in MP-MRI could avoid surgery in patients with indolent tumor, for whom the potential risk of surgery outweighs the survival benefit.

Key words: Multi-parametric MRI, Prostatic carcinoma, Prostate-specific antigen (PSA), PI-RADS, Gleason’s score, Apparent diffusion coefficient (ADC) values, TRUS guided biopsy.