INTRODUCTION AND AIMS: The kidney is the most vulnerable visceral organ afflicted by SLE. Although it carries potential risks and limitations, renal biopsy is still the golden standard method for evaluation of lupus nephritis (LN). Renal Doppler derived resistive index (RRI) is an appealing method for exploration of renal affliction. However its role in lupus nephritis is still a matter of controversy. The objectives of the present research is to study the role of RRI in the diagnosis of LN in comparison to renal biopsy findings and activity markers of the disease.

METHODS: This is a cross sectional study that was carried out on 88 subjects; 70 cases of SLE and 18 healthy control. Patients were divided into 2 groups, 46 lupus nephritis (LN) and 24 SLE patients without nephritis (LNN). All patients underwent a thorough clinical evaluation, as well as laboratory tests and immunological profile. An informed consent was obtained from all the participants. Renal biopsy was performed and appropriate treatment was given according to the local institutional policies. RRI was assessed immediately before renal biopsy and the operator was blinded to the study design. RRI values were compared to biopsy findings (Activity and chronicity indices and degree of tubulointerstitial fibrosis), Activity markers of the disease (Anti-ds DNA, Anti-C1q antibody, C3, C4, degree of proteinuria), and renal function (serum creatinine, and eGFR).

RESULTS: The study included 70 SLE patients (13 M, and 57 F) and 18 healthy control subjects (6 M, and 12 F). The mean age values in the 3 groups (LN, LNN, healthy control) were 27.8±8.3, 30.2±9.2, and 29.8±6.7 respectively. RRI was found to be significantly higher in LN than lupus non nephritis and healthy control groups (p=0.007, and 0.026, respectively). The mean±SD of RRI values among (LN, LNN, and healthy control) groups were, (0.59±0.059, 0.55±0.058, and 0.35±0.063) respectively. No significant difference of RRI values were observed among different International Society of Nephrology/ Renal Pathology Society (ISN/RPS) renal biopsy classes. RRI was significantly correlated with serum creatinine and eGFR in LN patients (rho=0.447, p=0.002) and (rho=0.435, p=0.002) respectively. However, RRI was not correlated with any of the activity markers of LN disease. RRI was significantly correlated with both chronicity index and degree of tubulointerstitial fibrosis (rho=0.625, p=0.0001) respectively. Patients with higher 50-percentile of RRI showed higher serum creatinine, lower eGFR, and higher chronicity and TIF scores than those with lower 50-percentile (p=0.024, 0.029, 0.001, and 0.01) respectively. Using regression analysis, serum creatinine and RRI were significant predictors of both chronicity index and tubulointerstitial fibrosis (R²=0.645, P=0.003,0.0001 respectively). The ROC curve was performed to determine RRI accuracy for detection of greater than 75% of tubulointerstitial fibrosis. It showed an area under the curve (AUC) of 0.88 with 100% sensitivity and 74% specificity.

CONCLUSIONS: RRI may act as a marker of chronic renal parenchymal changes in patients with LN. On appropriate clinical scenarios, higher values of RRI might possibly disqualify patients for more aggressive immunosuppression or invasive diagnostic techniques.