SUMMARY AND CONCLUSION

In this study the aim was to evaluate the neuropsychiatric manifestation in SLE patients using magnetic resonance spectroscopy (MRS). All patients were scheduled for single voxel proton brain examination (PROBE/SV) for measuring level of NAA ,Cr, Cho, and evaluate the NAA/Cr and Cho/ Cr ratios to get an idea about the changes in metabolites levels and ratios between patients with and without neuropsychiatric manifestations and healthy controls.

This study was carried out on twenty patients with SLE diagnosed according to the American College of Rheumatology (ACR) criteria ***(Tan et al., 1982)*** . All patients admitted in the in-patients and attending the out-patient clinic of the Rheumatology and Rehabilitation Department, Benha University Hospital.

They were 19 females (95%) and 1 males (5%), their age ranged between 18 and 50 years with a mean of 27.6±9.7 years and their disease duration ranged between 1 and 19 years with a mean of 3.5±1.7years.

Ten cross matched apparently healthy individuals were also included in this study as a control group.

All patients were subjected to the following:

- Full history taking.
- Clinical examination**:** General examination and local examination .
- Assessment of disease activity is evaluated by Systemic Lupus Activity Measure (SLAM) ***(Liang et al., 1989).***

- Laboratory investigations:

Eythrocyte sedimentation rate (ESR) ,complete blood picture for RBCs count, reticulocytic count, Hb level, haemotocrite value, WBCs count, (total and differential count) and platelet count ,complete urine analysis for proteinuria, RBCs ,casts , estimation of anticardiolipin antibodies IgG using the ELISA technique ,estimation of total albumin in 24 hours urine ,renal function test for serum creatinine and blood urea ,antinuclear antibodies (ANA) by immunoflourescence technique and anti-DNA antibodies.

- **Imaging study:**

All patients and controls underwent diagnostic MR brain imaging .

As regards MRS all patients were scheduled for single voxel proton, brain examination (PROBE/SV)

The findings of this study were as follow:

- The healthy subjects were comparable with the SLE patients as regard to age and sex with the mean age in SLE patients was 27.6 ± 9.7 years old and in healthy controls was 24.4 ± 7.6 years old, sex was 1 : 19 male to female in SLE patients and 1 : 9 male to female in healthy controls with no statistical significant difference between both groups in age and sex (P > 0.05).The mean disease duration in SLE patients was 3.5 ± 1.7 years .

- The frequency of different clinical manifestations in SLE patients were :55% of patients had fever, 80% had skin manifestations, 85% had arthritis, 55% had renal manifestations, 5% suffered from cardiac problems, 35% with pulmonary symptoms and 30% had CNS manifestations.

- The laboratory findings in both SLE patients and healthy controls were: the mean value of ESR in SLE patients was 45.3 ± 38.8 mm/1st h and in healthy controls was 16.8 ± 6.48 mm/1st h ,heamoglobin (Hb) was 10.48 ± 1.36 gm/dl in SLE patient and 11.3 ± 0.95 gm/dl in healthy controls, WBCs was 5570 ± 1170/cmm in SLE patients and 5300 ± 1680/cmm in healthy controls .There was no statistical significant difference in these variables (P > 0.05) between

both SLE patients and healthy controls except in ESR where a statistical significant difference was found ($P < 0.05$).

- The immunological findings in SLE groups, were in the neuropsychiatric SLE patients (NPSLE) 66.6% had anti-DNA Ab and anti-cardiolipin Ab and in SLE patient without neuropsychiatric manifestation 71.9% had anti-DNA antibodies and 7.1% had anticardiolipin Ab .All SLE patients had ANA (anti-nuclear antibodies).

- As regards to disease activity grading in SLE patients, 5% had severe, 40% had moderate and 55% had mild disease activity.

- As regard to the radiological studies 50% from the NPSLE patients had abnormal MRI findings as partial atrophy, white matter hyperintensities in T_2, some showed areas of infarctions, only 14.2% patients without neuropsychiatric manifestation had white matter hyperintensities in T_2 weight images.

- As regard to MRS findings, abnormal MRS findings found in 83.3% of NPSLE patients and 28.5% in patients without neuropsychiatric manifestation , there is neither MRS nor MRI abnormality in healthy controls.

- A highly significant difference in NAA/Cr ratios in basal ganglia between SLE patients and healthy controls ($P < 0.001$), but no statistical significant difference in NAA/Cr ratios in white matter between SLE patients and healthy controls ($P > 0.05$).

- A statistical significant difference ($P < 0.05$) in Cho/Cr ratios in both basal ganglia and white matter between both SLE patients and healthy controls.

- No statistical significant difference in NAA/Cr and Cho/Cr ratios in white matter and basal ganglia between patients with and without neuropsyciatric manifestations ($P > 0.05$)this can be an indicator that MRS may be considered as predictor for detection of early changes in brain inspite the absence of MRI findings and absence of the neuropsychiatric manifestationsas there is no statistical significant difference between patients with and without neuropsyciatric manifestations but there is statistical significant difference between NPSLE patients and healthy controls.

- The disease activity grading showed a statistical significant difference between patients with and without neuropsychiatric manifestations ($P < 0.05$).

- Also in SLE patients a statistical significant difference found between disease activity grading and abnormal MRS findings ($P < 0.05$) ,but no significant difference found between abnormal MRI findings and disease activity grading($P > 0.05$).

- In NPSLE patients there was positive statistical significant correlation found between abnormal MRI findings and sex, disease activity and abnormal MRS findings ,and a positive statistical significant correlation found between abnormal MRS findings and disease activity and abnormal MRI findings ($P < 0.05$).

- In patients without neuropsyciatric manifestations there was positive statistical significant correlation between abnormal MRI findings and disease activity and between abnormal MRS findings and disease activity ($P < 0.05$).

In conclusion, the decreased NAA/Cr ratio and increased Cho/Cr ratio in the basal ganglia and the periventricular white matter of patients with SLE examined at MR spectroscopy directly correlate with the presence of neuropsychiatric manifestations and bear no relation to the presence of abnormal MR imaging findings.

A substantial population of patients with SLE do not have abnormal brain MR images and have only neuropsychiatric changes, which cannot be detected at conventional MR imaging. MR spectroscopic (MRS) examination in patients with SLE could reflect the area where the metabolic changes might precede the morphologic changes. This preliminary results point to a putative relevance MRS in SLE patients, specifically concerning CNS involvement.