SUMMARY AND CONCLUSION

The term schizophrenia is used for a group of mental illness characterized by specific psychological symptoms and leading in the majority of cases to disorganization of the personality of the patient. These psychological symptoms are classified together because they show a similar and a characteristic disturbance of thinking- emotion- volition- perception and behavior.

Schizophrenia is a chronic, debilitating psychotic mental disorder that affects about 1 percent of people. A new generation of medications and recent developments in neuropathology, brain imaging, and molecular genetics have led to a greater understanding of the pathophysiology of schizophrenia and to improved treatment. Nonetheless, it remains an enigmatic illness that places a substantial burden on patients, their families, and society.

The clinical presentation of schizophrenia is characterized by marked variability in age and type of onset, premorbid adjustment, signs and symptoms, treatment response and course of illness.

Schizophrenia has diffrent subtypes; Catatonic, Disorganized (hebephrenic), paranoid, undifferentiated and residual. The disease has also different course pattern; Continuous, episodic with progressive deficit, episodic with stable deficit, episodic remittent, complete or virtually complete remissions between psychotic episodes, incomplete remission and complete remission pattern.

The imaging modalities used for the diagnosis of the disease includes: Computed tomography, magnetic resonance imaging, positron emission tomography and magnetic resonance spectroscopy.

Magnetic resonance spectroscopy (MRS) had been recognized by the American Medical Association and Medicare as a safe diagnostic technique that can be used to monitor serially biochemical and metabolic changes in the disease processes. In addition, MR spectroscopy coupled with MR imaging techniques allows for the correlation of anatomic and physiologic with changes in the metabolic and biochemical processes occurring within tissue.

The technique of MRS is based on the chemical shift property of atoms. MRS defines neurochemistry on regional basis by acquiring a radiofrequency signal with chemical shift from one or many voxels or volumes previously selected on MRI. From the resulting spectrum, up to 80 brain metabolites can be distinguished. Each neurometabolite is localized on a horizontal scale (chemical shift), and their relative metabolite concentration is determined from the metabolite's peak height.

In vivo MRS is capable of providing information on the functioning or viability of neurons, axons and astrocytes as well as on the energy status and membrane constituents. In vivo ^{1}H spectroscopy has been the most popular approach to MRS. N-acetyl

aspartate (NAA), the most abundant signal, is considered as a marker of functioning neuroaxonal tissue that includes functional aspects of the formation and/or maintenance of myelin. In vivo ^{31}P spectroscopy offers information on metabolites that are part of the anabolic and catabolic pathway of membrane phospholipids (MPLs).

Several studies using low magnetic field devices reported a change in NAA levels in chronic schizophrenia patients, while studies using high magnetic MR devices did not have results consistent with these findings**.**

According to the glutamatergic hypothesis of schizophrenia, the glutamatergic system becomes hyperactive in the acute stage and causes neuroinflammation and apoptosis of neurons through excitotoxity. This hypothesis suggests that the Glu concentration may become higher in the acute stage and lower in the chronic stage.

The mI concentration was significantly lower in schizophrenic patients as compared to the healthy subjects. Previous ^{1}H-MRS studies with schizophrenic patients did not show consistent results regarding mI concentration.

Several lines of biochemical evidence suggest that membrane phospholipid metabolism may be impaired in some patients with schizophrenia. This evidence is consistent with the membrane phospholipid hypothesis of schizophrenia, which proposes a change in brain membrane phospholipids leading in turn to changes in the

functioning of membrane associated proteins and of cell signaling system. 31-phosphorus magnetic resonance spectroscopy of the brain has been used to study membrane phospholipids metabolism, by assessing the ratio of phosphomonoesters (PME), which index phospholipids anabolism, to phosphodiesters (PDE), which index phospholipids catabolism, with inconsistent results in schizophrenia.

Total creatine (Cr) levels are widely used as an internal reference for the quantification of other metabolites in ^{1}H magnetic resonance spectroscopy (MRS). Several recent studies have found reduced Cr levels in the anterior cingulate cortex in schizophrenia and dorsolateral prefrontal cortex of individuals at high risk of psychosis**.** Cr levels have also been variably reported to increase or decrease with advancing age.

MRS studies have revealed reductions in neuronal and membrane integrity in early schizophrenia and in those at risk for the disorder in brain regions where structural and functional alterations are also observed. Future prospective ^{31}P and ^{1}H spectroscopy studies at high-field of children and adolescents at risk for and those already presenting with schizophrenia are needed to identify the point in time regional deviations occur at the early stage of illness with respect to the normal course of development. Many questions remain in regard to the precise pathophysiological significance of NAA and PME alterations in schizophrenia.