عنوان مقاله:

Magnetic Resonance Spectroscopy (Mrs) & Its Role in the Investigation And Diagnosis Of Brain Disorders

محل انتشار:

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خلاصه مقاله:

Magnetic resonance spectroscopy (MRS) is a unique and useful methode for evaluating biochemical metabolisms in human organs and tissues. Brain MRS is a noninvasive diagnostic method for assessing neurological abnormalities at the microscopic level and measuring in vivo brain metabolites and biochemical changes. While MRI identifies the anatomical location of a tumor, MRS compares the chemical composition of normal brain tissue with abnormal tumor tissue. On the other hands, Conventional MRI cannot depict changes in cell types or biochemical compositions, whereas magnetic resonance spectroscopy has this capability. MRS analyzes molecules such as hydrogen ions or protons and Proton spectroscopy is more commonly used. As a matter of fact, There are several different matabolites, or products of matabolism, that can be measured to differentiate between tumor types that includes N-acetyl aspartate, Glutamate, myo-inositol, Choline, Alanine, Creatine, Lactate, etc. MR Spectroscopy can be used to determine tumor type and aggressiveness, and distinguish between tumor recurrence and radiation necrosis. Additionally, this test can be used to detect tissue changes in stroke and epilepsy, and will help to dignosis infectious and demyelinaing lesions, neurodegenerative diseases, traumatic brain injuries, cerebral metabolic disorders, etc. It should be pointed out that there are two classes of spatial localization techniques which include single voxel (SV) and multi-voxel (MRSI). SV-MRS is usually performed using STEAM or PRESS sequences. Furthermore, correct choice of protocol (SV or MRSI, short or long TE) depends on many factors. It should be noticed that Shimming, water and fat suppression are vital. Consequently, this article seeks to provide an overview of physics and techniques of MRS and its clinical implementation for the assessment of prognostification, diagnosis and monitoring of various brain disorders.

کلمات کلیدی:

Magnetic resonance spectroscopy, metabolites, brain tumors