ABSTRACT

Accuracy of magnetic resonance spectroscopy in discrimination of neoplastic and non-neoplastic brain lesions.

Alshammari QT(1), Salih M(1), Gameraddin M(2), Malik BA(1), Yousef M(3), Loaz O(4).

Author information:
(1)Diagnostic Radiology Department, College of Applied Medical Sciences, University of Hail, Hai'l . Saudi Arabia.
(2)Taibah University, Diagnostic Radiology Department, College of Applied Medical Sciences, Al-Madinah. Saudi Arabia.
(3)Radiological sciences Department, Batterjee Medical College, Jeddah. Saudi Arabia.
(4)Diagnostic Radiology Department, College of Medical Applied Sciences, King Khalid University, Abha. Saudi Arabia.

BACKGROUND: Differentiation of brain lesions by conventional MRI alone is not enough. The introduction of sophisticated imaging methods, such as MR spectroscopy (MRS), will have considered contribution and accuracy to the differentiation.
OBJECTIVE: To determine the diagnostic accuracy of MRS in differentiating neoplasm and non-neoplastic brain lesion.
METHODOLOGY: This is a cross-sectional descriptive study conducted at Khartoum State from the period of 2015 to 2017. Thirty cases with brain lesions were included in the study investigated with MRS (Single-voxel spectroscopy) and conventional MRI. A comparison of MRS findings and histopathologic analysis was performed. The ratios of Cho/Cr and Cho/NAA were analyzed and compared between neoplastic and non-neoplastic brain masses. Data were analyzed using SPSS version 23.
RESULTS: Out of the 30 patients affected with brain lesions, there were 16 females and 14 males with a mean age of 44 +- 18 years. The ratios of Cho/Cr and Cho/NAA were higher in gliomas, astrocytoma, and meningioma than non-neoplastic lesions. Kappa statistical value (K) showed a good agreement between MRS and histopathological analysis (K= 0.60). The diagnostic accuracy of MRS was 100%, with 82.60% sensitivity, 85.71% specificity, 95% PPV, and 60% NPV.
CONCLUSION: MRS has high diagnostic accuracy in differentiating neoplasm from non-neoplastic brain tumors. The elevation ratios of Choline-to- N-acetyl aspartate and choline-to- creatine can help Neurosurgeons and clinicians differentiate benign from malignant masses.