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Title: Value of proton magnetic resonance spectroscopy of brain to study the cerebral metabolic abnormalities in COPD: Initial experience

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Body: Background: Proton magnetic resonance spectroscopy (1H MRS) is technique that detects metabolic changes of the brain in chronic obstructive pulmonary disease (COPD). Objective: To study the cerebral metabolic changes in (COPD) patients using (1H MRS). Methods: This study was carried out on 20 COPD patients and 20 healthy controls. Pulmonary function, arterial blood gases, and 1H MRS of brain had undergone. The metabolic ratios of N-acetyl aspartate to creatine (NAA/Cr) and choline to creatine (Cho/Cr) were calculated by single voxel technique. Results: in COPD patients the mean value of NAA/Cr and Cho/Cr in parieto-temporal area were (1.82 ± 0.35) and (0.99 ± 0.21), respectively, while in occipital area were (1.59 ± 0.31) and (0.81 ± 0.26), respectively. Compared with healthy control subjects, the mean values of Cho/Cr in COPD patients were lower in parieto-temporal (0.99 ± 0.21 vs. 1.10 ± 0.31 ; $p=0.22$) and occipital areas (0.81 ± 0.26 vs 0.88 ± 0.21 ; $p=0.37$). While, the mean values of NAA/Cr in COPD patients were higher in both parieto-temporal (1.82 ± 0.35 vs 1.68 ± 0.22 ; $p=0.14$) and occipital areas (1.59 ± 0.31 vs. 1.39 ± 0.39 ; $p=0.08$) of the brain. There was positive correlation between the concentration of brain metabolites and PCO₂ in COPD patients. Conclusions: 1H MRS is noninvasive technique that detects cerebral metabolic changes in COPD patients.