Short Communication

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MR DSC perfusion and multivoxel spectroscopy in intracranial lesions: Practical applications

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Abstract

With advancement in surgical treatment and chemotherapy options, imaging modalities also need to incorporate advanced neuroimaging modalities for more accurate diagnosis and grading of intracranial masses. This prospective study aims to distinguish intracranial space occupying lesions using dynamic susceptibility MR perfusion and multi voxel spectroscopy techniques. It also attempts to distinguish between progression, pseudo progression and morphologically similar appearing pathologies. The main purpose of chemotherapy is to kill cancer cells. It usually is used to treat patients with cancer that has spread from the place in the body where it originated (metastasized). Chemotherapy destroys cancer cells anywhere in the body. It even kills cells that have broken off from the main tumor and travelled through the blood or lymph systems to other parts of the body.

Chemotherapy can cure some types of cancer. In some cases, it is used to slow the growth of cancer cells or to keep the cancer from spreading to other parts of the body. Chemotherapy may be given before surgery or radiation therapy to shrink the tumor (neoadjuvant therapy). When a cancer has been removed by surgery or treated with radiation therapy, chemotherapy may be used to keep the cancer from coming back (adjuvant therapy).

Once a remission is achieved, consolidation chemotherapy, also called intensification chemotherapy, is given to sustain a remission. Maintenance chemotherapy is chemotherapy given in lower doses as a treatment to prolong a remission in certain types of cancer. Chemotherapy also can ease the symptoms of cancer (palliative chemotherapy), helping some patients have a better quality of life.

Materials & Methods:

150 Patients including all age groups, intra and extra axial, supratentorial and posterior fossa lesions were grouped and subjected to perfusion and/or spectroscopy in addition to conventional sequences. Histopathology was considered as gold standard and clinical follow up with reimaging was done in cases where biopsy was not performed. Data was analyzed and cut off values for rCBV, Cho/NAA and Cho/Cr were obtained.

Results:

An intracranial lesion could be said to be high grade if rCBV value was greater than or equal to 2.5(sensitivity- 85%, specificity- 88%) while cut off value for Cho/NAA was 2.5 for high grade gliomas (sensitivity 91%, specificity 87%) with Cho/Cr cut off 1.7 (sensitivity 75 %, specificity 62 %).For the follow up cases with known HPE, perfusion was superior compared to spectroscopy (Sensitivity- 84.2%, specificity- 100%, PPV- 100% and NPV- 78.6 % with higher accuracy for perfusion versus Sensitivity- 81.8 %, specificity- 100%, PPV- 94.7 % and NPV- 50 % for spectroscopy).

Conclusion:

MR perfusion and spectroscopy if used wisely, can improve diagnostic performance especially where conventional MRI is doubtful. The lower specificity of Cho/Cr can be attributed to high level of choline in some low-grade gliomas. Lipid lactate is another metabolite which yielded low specificity as it was elevated in necrotic high-grade tumors as well as post treatment changes. Further studies may be required for better standardization of these methods so they can be incorporated in imaging protocol on a larger scale.

Biography:

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