Evidence Table

Clinical Area: MRS for cerebral tumors

Study Type: Comparison of diagnostic tests
Study Aim: To evaluate the usefulness of Magnetic Resonance Spectroscopy (MRS) in differentiating neoplastic brain tumors from other tumor-like processes.

Outcomes
• Primary: MRS-based diagnosis, consistency of diagnosis.

Design
• Number of subjects: n=29 patients, n=15 healthy volunteers.
• Description of study population: Patients: 14 men/15 women, age range 21-72. Healthy volunteers: 8 men/7 women, age range 21-59.
• Eligibility criteria: Patients: Initial diagnosis of brain tumor on basis of clinical examination or CT; Ambiguous CT.
• Procedure: All study participants received both a brain MRI and MRS. Brain tumor patients received biopsy or surgery to remove the tumor. Lesion types according to MRI and MRS combined were compared to postoperative pathology or biopsy findings.
• Source of outcome data: MRI, MRS.

Validity
• Independent blind comparison with a gold standard or follow-up of those not receiving the gold standard test? Yes.
• Appropriate spectrum of disease? There were only two non-tumor patients.
• Consecutive patients? Not reported.
• Methods described in enough detail to enable you to replicate the test? Yes.
• Reproducible results? Yes.

• Conclusions regarding validity of methods: The overall sample size was small. There were an insufficient number of non-tumor patients to evaluate whether MRS could distinguish these from tumors.
Results

Comparison of the MRI/MRS and pathology results in the differential diagnosis of tumor type

<table>
<thead>
<tr>
<th>Pathology result</th>
<th>No. MRI/MRS diagnoses consistent with pathology/No. cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor</td>
<td>22/27</td>
</tr>
<tr>
<td>Astrocytoma G2</td>
<td>5/5</td>
</tr>
<tr>
<td>Oligodendrogioma</td>
<td>2/5</td>
</tr>
<tr>
<td>Glioblastoma G4</td>
<td>7/7</td>
</tr>
<tr>
<td>Meningioma</td>
<td>5/5</td>
</tr>
<tr>
<td>Metastases</td>
<td>3/5</td>
</tr>
<tr>
<td>Non-tumor</td>
<td>2/2</td>
</tr>
</tbody>
</table>

Accuracy of MRI/MRS for diagnosing tumors (calculated by reviewer):
Sensitivity=22/27=81%
Specificity=2/2 (100%--but sample too small for reliable statistics)

Note: An eligibility criterion was an ambiguous CT scan suggestive of brain tumors. 27/29 (93%) did have brain tumors according to pathology/biopsy findings.

Authors’ Conclusions

“1H MRS proved to be a useful tool in establishing tumor type and differentiating between neoplastic and large inflammatory tumor-like lesions.”

Reviewer’s Conclusions

Only two patients did not have tumors—this is an insufficient number for establishing the ability of MRS to distinguish between tumors and non-tumors. MRS findings were consistent with pathology/biopsy for 22 out of 27 (81%) of the patients with tumors.