Purpose: MPS IVa is a lysosomal storage disorder caused by a deficiency of N-acetylglucosamine-6-sulfatase. Main symptom is systemic skeletal dysplasia. Affection of the vascular system has not been described yet. Goal of this study is the analysis of the vascular system in patients with MPS IVa, based on the example of the aorta.

Methods: In a retrospective study, 32 patients with MPS IVa aged 10-49 years (μ: 22, 5; m: 21) were included. All patients were of small stature (length 106 ±19 cm). The aorta in its course from 4th thoracic vertebra to 10th was analyzed on the basis of 49 craniospinal axial plane MR and 4 axial plane CT examinations. To describe the course of the aorta, we divided the area around the vertebral body into 5 equal parts, each at an angle of 36°. Therefore, we connected the processes transversi with a straight line and numbered the segments from right (segment 1) to left (segment 5). High buckled arteries in relation to the length of the affected aortic part were indicated as aortic kinking, and a moderate twist in relation to the length of the affected aortic part as aortic coiling.

Result: 12 of 32 patients had an aortic kinking, 10 of 32 patients an aortic coiling, 4 of these had moderate and 3 strongly coiled aorta. 7 patients had a normal aortic course, 4 couldn’t be analyzed. One patient revealed both, aortic kinking and coiling.

Conclusion: This study reveals for the first time the occurrence of aortic tortuosity in patients with MPS IVa. Although the etiology is still unknown, we suggest, that this complication could be due to glycosaminoglycan deposition in the aortic intima respectively media, which may be associated with an increased vulnerability of the vascular wall and a rupture of the elastic fibers. Therefore, we conclude that the examination of the vascular system should be included in regular follow-up protocols of MPS IVa patients.

EPO:166
RELATIONSHIP BETWEEN BRAIN ATROPHY AND NATALIZUMAB THERAPY IN THE TREATMENT OF MULTIPLE SCLEROSIS

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Purpose: To assess global brain volume changes during natalizumab therapy in patients affected by multiple sclerosis (MS).

Methods: Magnetic Resonance Imaging (MRI) scans of 20 MS patients on natalizumab therapy were retrospectively estimated to assess the percentage of brain volume change (PBVC) at baseline, 6 and 12 months by using a SPM-SIENA software.

Result: There was a significant (p = 0.5) PBVC decrease during the first year. Differences were more marked in patients with gadolinium-enhancing MS lesions (p = 0.05). Mean GMF and WMF changes during the first year of treatment were significant (p < 0.5).

There were a significant (p < 0.5) correlation between the presence of active lesions and PBVC changes with a more significant (p < 0.1) correlation with WMF change during the first year of treatment.

No predictors were found for GMF volume changes.

Conclusion: Global brain volume loss during natalizumab therapy is mainly due to WMF volume loss and it is related to the inflammatory activity present at the onset of therapy.

Multiple sclerosis, brain atrophy, natalizumab

EPO:167
ASSESSMENT OF WHITE MATTER LESIONS AND WHITE MATTER TRACTS INTEGRITY IN OLDER FALLS USING ADVANCED MRI TECHNIQUES

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Purpose: To assess the severity of white matter lesions, WML (as determined by conventional MRI parameters i.e. WML grades and volume) and microstructural integrity of specific white matter tracts (as determined by diffusion tensor imaging, DTI i.e. fractional anisotropy, FA axial diffusivity, AD and radial diffusivity, RD values) among older individuals with a history of falls compared to non-faller controls.

Methods: 88 participants, aged 64-87 years, (46 fallers and 42 non-fallers) were recruited from the Malaysian Falls Assessment and Intervention Trial (MYFAT) cohort. T1-weighted FSPGR, T2-weighted, FLAIR and DTI sequences of the brain were obtained using a 3-Tesla MRI. Severity of WML was graded from 0 to 3 using the modified Fazekas scale. WML volume was calculated using Lesion Segmentation Tool in SPM8. FA, AD and RD values were obtained from selected WM tracts using combined tract-based spatial statistics (TBSS) and region-of-interest (ROI) methods.

The threshold for significant clusters in TBSS was adopted as 0.05 and for significant fraction of voxels of TBSS in each ROI as 30%.

Result: The percentage of fallers compared to non-fallers was significantly higher in the group of high WML grades i.e. Fazekas Scale of 2-3, than in the group of low WML grades i.e. Fazekas Scale of 0-1 (85.2% vs. 37.7%, OR = 9.5, 95% CI 2.92-30.96, p<0.001).

The WML volume of the fallers group (median = 18.41 cm3) was also significantly higher than the non-fallers group (median = 2.87 cm3) (p<0.001). AD was identified as the most affected marker of microstructural integrity for specific WM tracts in the fallers. The AD values of middle cerebellar peduncle, genu of corpus callosum, (both) anterior limb, (right) posterior limb and (left) retrotemporal part of the internal capsules, posterior left corona radiata, both external capsules and right temporal part were significantly higher among fallers compared to non-fallers (p < 0.05). Both FA and RD values of these tracts were not significant.

Conclusion: Our data suggests fallers have significantly higher WML burden than non-fallers in the older population. DTI data suggests loss of integrity of various WM tracts in the older population with falls with AD as the most sensitive marker.

Geriatric, Fazekas, tractography

EPO:168
A LONGITUDINAL STUDY OF DIFFUSION TENSOR IMAGING IN MILD TRAUMATIC BRAIN INJURY: COMPLICATED VERSUS NON-COMPLICATED

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Purpose: To document the longitudinal changes in the microstructural integrity of white matter (WM) tracts in the mild-complicated traumatic brain injury and mild- uncomplicated traumatic brain injury patients using diffusion tensor imaging (DTI),

<table>
<thead>
<tr>
<th>Tract</th>
<th>FA</th>
<th>MD</th>
<th>AD</th>
<th>RD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middle Cerebellar Peduncle</td>
<td>0.75</td>
<td>0.46</td>
<td>0.64</td>
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</tr>
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<td>0.38</td>
<td>0.56</td>
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<td>Anterior Limb of Internal Capsule</td>
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<td>0.32</td>
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<td>0.35</td>
<td>0.51</td>
<td>0.26</td>
</tr>
<tr>
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<td>0.70</td>
<td>0.38</td>
<td>0.56</td>
<td>0.29</td>
</tr>
<tr>
<td>Superior Longitudinal Fasciculus</td>
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<td>0.39</td>
<td>0.55</td>
<td>0.28</td>
</tr>
<tr>
<td>Posterior Periventricular White Matter</td>
<td>0.69</td>
<td>0.38</td>
<td>0.54</td>
<td>0.27</td>
</tr>
<tr>
<td>Genu of Corpus Callosum</td>
<td>0.70</td>
<td>0.38</td>
<td>0.55</td>
<td>0.27</td>
</tr>
<tr>
<td>Splenium of Corpus Callosum</td>
<td>0.70</td>
<td>0.38</td>
<td>0.55</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Table 1: Longitudinal changes in the TDI of WM tracts using Whole Brain Mask Test

*significant difference with α < 0.05