**Viability of MiSFIT in Migraine clinical studies using single shell acquisitions (P.02.17)**

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### Introduction

**White matter** (WM) changes have been identified in **migraine** patients using DTI but are insufficient [1].

**Goal:** Evaluate the viability of the transverse diffusivity (**\(\lambda_\perp\)**) [2,3], calculated using **MiSFIT** [2], from DTI single-shell acquisitions.

\(\lambda_\perp\): effective diffusion perpendicular to a small fiber section.

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### Methods

**Acquisition:** dMRI, single-shell (\(b=1000 \text{ s/mm}^2\))

<table>
<thead>
<tr>
<th>Group</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Controls (HC)</td>
<td>50</td>
</tr>
<tr>
<td>Episodic Migraine (EM)</td>
<td>51</td>
</tr>
<tr>
<td>Chronic Migraine (CM)</td>
<td>56</td>
</tr>
</tbody>
</table>

**Processing**

- \(\lambda_\perp\) measure using MiSFIT
  - Free water is not considered
  - Constant Parallel diffusivity (**\(\lambda_\parallel\)**)
- TBSS analysis
- Statistically significant results: \(p<0.05\) and regions > 30mm\(^3\)

### Results

- **HC**
  - \(\lambda_\perp\) : EM > HC
  - 1 ROI

- **EM**
  - AD: EM > CM - 40 ROIs
  - MD: EM > CM - 38 ROIs
  - \(\lambda_\perp\): EM > CM - 7 ROIs

- **CM**
  - AD: EM > CM
  - MD: EM > CM

### Discussion

**MiSFIT** can detect alterations using standard single-shell DTI acquisitions, with constant \(\lambda_\parallel\).

\(\lambda_\perp\) is able to provide **complementary information** to traditional DTI measures, especially in areas with complex fiber configurations.

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**References:**


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