Value and difficulties of standardized examinations in Multiple Sclerosis

KO Lövblad
Introduction

MS in inflammatory disease of CNS of unknown origin
Introduction

Clinical and radiological criteria important
Value and difficulties of standardized examinations in Multiple Sclerosis
Value and difficulties of standardized examinations in Multiple Sclerosis

Value: high for follow-up and studies
Value and difficulties of standardized examinations in Multiple Sclerosis

Difficulties: originate in technical disagreements
Since lesion count and lesion enhancement play a role

Extreme importance of examination standardization

For diagnosis, follow-up and treatment
Day to day problems

Different examination planes
Different sequences
Different MR machines

Different radiologist
Different neurologist

Multiples causes of variability!
Imaging parameters

Axial T1-WI

Axial FLAIR or Dual-echo

Sag FLAIR or Dual-echo, optional

Contrast-enhanced T1-WI

Diffusion, optional
Imaging parameters

Axial FLAIR or Dual-echo

Contrast-enhanced T1-WI
Multiple Sclerosis
Multiple Sclerosis
McDonald criteria

Original
At least one enhancing lesion or 9 T2 hyperintense lesions
At least one infratentorial lesion
At least one juxtacortical lesion
At least 3 periventricular lesions

A spinal cord lesion can be considered equivalent to a brain infratentorial lesion; an enhancing spinal lesion is equivalent to an enhancing brain lesion and spinal lesions can contribute to the total T2 lesions.


Revised Mc Donald Criteria

Two separate MRI scans

Dissemination in time: enhancement or new T2 lesion

Dissemination in space
# Barkhof Criteria

<table>
<thead>
<tr>
<th>Lesion Type</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juxtacortical lesion</td>
<td>one or more</td>
</tr>
<tr>
<td>Enhancing lesions</td>
<td>one or more</td>
</tr>
<tr>
<td>Infratentorial lesions</td>
<td>one or more</td>
</tr>
<tr>
<td>Periventricular lesions</td>
<td>three or more</td>
</tr>
</tbody>
</table>

At least three criteria necessary


Mc Donald ?
Mc Donald!
Other possible regions

Orbit

Spine
T V, 19 yo female
Gadovist

Gadovist MS

3 6 9 12
3D imaging

Allows secondary re-slicing

Lower quality

Gradient echo-images

Good for studies, average for routine
3D FLAIR
3D vs 2D
3D vs 2D
Conclusions 1

Standardization is necessary for MS
- For diagnosis
- For follow-up studies

T2 and post Gd T1 are mainstay approaches

At least try to repeat same protocol

Try to perform 3D studies (post-processing)
Conclusions 2

Dual-echo better than FLAIR

To gain time, may be performed after Gd

Automatic repositioning (provided by MR manufacturer)
Proposed reading


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