What are the test performance parameters of MRI for diagnosis of multiple sclerosis?

Hypothetical Case:

35 year old white male with no pmhx who presents with 6 week history of monocular blurry vision with painful EOMs. This is the first time he’s experienced anything like this. He takes no medications and has never been hospitalized before. No family hx of neurological disorders. He asks you, “Doc, is there any test you can run to test me for the MS?”.

Why is this patient’s question a good one?

- There are disease modifying drugs (interferon beta; glatirameracetae) that delay 2nd MS flare by up to a year
- There is no true unequivocal gold standard for MS diagnosis

Article to answer this question?


How I found the article?

The Article:

- At the time of publication, poser criteria (originally a research tool) was used as the best available reference standard, which has pretty much been supplanted now, at least clinically, by McDonald MRI Criteria
- Systematic review
- Seeks to compile articles that compare MRI, CSF +/- EVOP combinations to traditional clinical criteria (poser, mcdonald); included studies with at least 40 patient followed for 2 years
- MRIs performed in London, Barcelona, and Amsterdam
- 42 studies included by two independent screeners, out of 2125 hits on PubMed/MeSH search
- Included studies were retrospective, prospective cohort, and RCT of CIS (clinically isolated syndrome) patients
- Excluded studies were those that solely focused on clinically definite MS and those that only compared lab techniques
- Diagnostic Odds Ratios created for each study;
  -positive among diseased/positive among non-diseased
  -combines sensitivity and specificity
  -1 is no better than chance
  <-5 is arbitrarily considered a poor test
  -the higher the DOR, the better the test performance

Valid?

- Researchers faced uncertainty; a lot of uncertainty; exception may be in retrospective studies
- The reference standard was used regardless of which other criteria was studied
- There was no gold standard
- Overall, somewhat equivocal but seem to be valid

Results:

MRI alone – sensitivity 35-100%; specificity 36-92%; DORs ranged widely from 1 to 90
MRI + CSF – sensitivity 56-100%; specificity 59-96%

Drawbacks of this systematic review:

- Only 2 years of follow up required, whereas general consensus is that 10 years needed to rule out most MS cases
- Lack of clear definition for CIS creates study heterogeneity; 39 of final 42 studies had CIS groups/subgroups
- A minor point is that no other databases were searched

Does this article influence how I workup patients suspected of having MS?

- I think that it confirms my propensity to order brain/spinal MRI in this type of patient
- Awareness that MRI is not to be used alone for diagnosis; most neurologists now use McDonald criteria; Poser would posit that McDonald criteria yields too many false positives