

# Pilot study examining internal jugular vein stenosis in MS, CIS, and healthy controls with a blinded MRV protocol

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# Objective

- To evaluate the presence of venous stenosis of >50% in at least one of the internal jugular veins on MRV in people with MS, clinically isolated syndrome (CIS), and age- and gender-matched healthy controls using blinded and independent reads; and to examine inter-reader correspondence.
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# Background

- The prevalence and significance of venous stenosis on MRV are unknown. MRV has been proposed as a screening modality for evaluating venous stenosis.<sup>1</sup>
  - Stenosis is proposed to be associated with MS <sup>2</sup> and stenosis >50% on catheter venography has been suggested as a threshold for venoplasty in people with MS.<sup>3</sup>
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# Methods - Subjects

- 5 subjects with MS
  - 10 subjects with CIS
  - 15 age- and gender-matched healthy controls
- } Disease group
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# Methods - Procedures

- Time-of-flight MRV with contrast was performed on 1.5T scanners (Vision; Siemens, Erlangen, Germany)
  - Images were independently read by two experienced radiologists
  - Measured axial diameter at narrowest segment and reference segment where vessel has parallel walls
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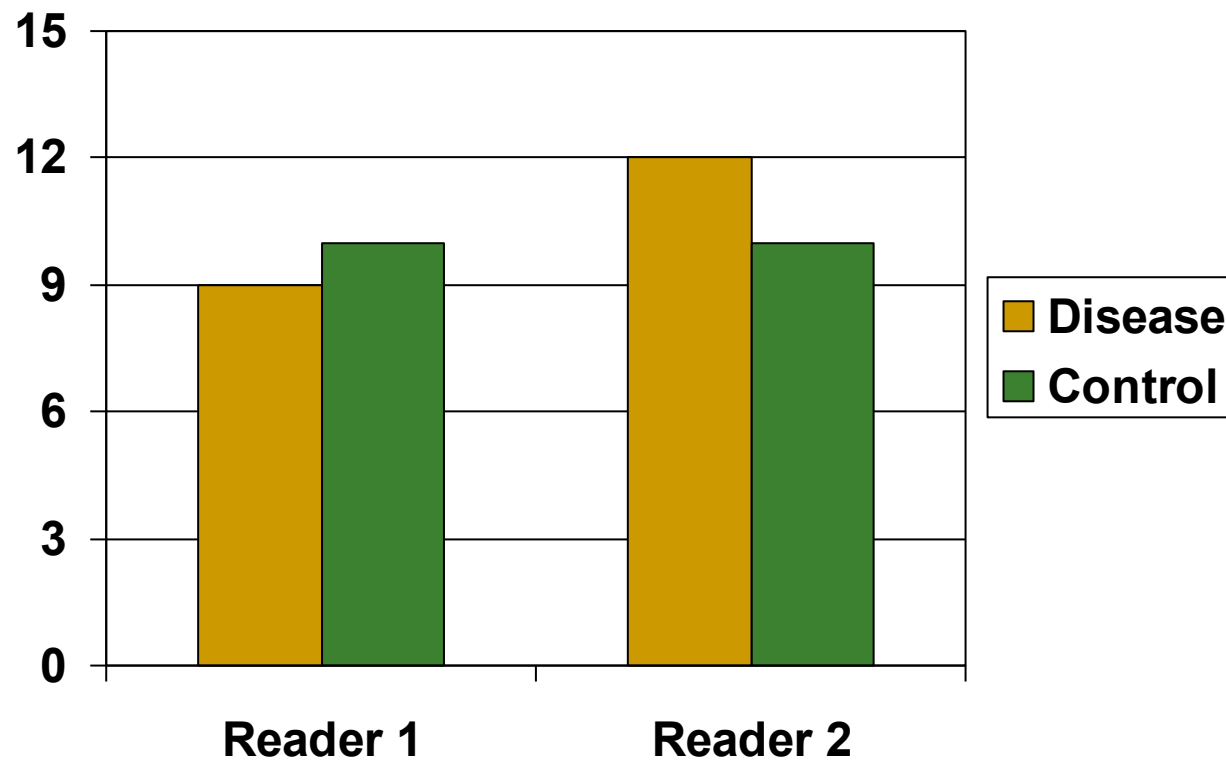
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# Results

- Median ages were
    - 47.0 (MS)
    - 44.1 (CIS)
    - 44.6 (controls)
  - Median duration of disease since symptom onset were 27.7 (MS) and 2.9 (CIS) years
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# Results:

Stenosis in at least one IJV >50% (2 groups)



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## Results:

Stenosis in at least one IJV >50% (3 groups)

	<b>MS</b>	<b>CIS</b>	<b>controls</b>
<b>Reader 1</b>	2 (40%)	7 (70%)	10 (67%)
<b>Reader 2</b>	4 (80%)	8 (80%)	10 (67%)

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# Results:

## Reader agreement

Agreement no stenosis	Agreement stenosis in LIJV only	Agreement stenosis in RIJV only	Agreement stenosis in both IJVs
6	1	3	8

Disagreement in 12/30 cases

Overall Kappa for agreement per vessel was 0.45

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# Conclusions

- Results support that at least one stenosis of >50% is common in persons with MS, CIS, and healthy controls. Narrowing of >50% may represent normal anatomic variability.
  - Results suggest variability in the identification of venous anomalies on MRV even among experts.
  - Our results, similar to others, challenge the previously-reported patho-physiological significance of stenosis >50% related to MS or CIS.
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# References

- <sup>1</sup> Haacke EM, Feng W, Utriainen D, Trifan G, Wu Z, Latif Z, Katkuri Y, Hewett J, Hubbard D. Patients with multiple sclerosis with structural venous abnormalities on MR imaging exhibit an abnormal flow distribution of the internal jugular veins. *J Vasc Interv Radiol*. 2012; 23:60-68.e1-3.
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  - <sup>3</sup> Mandato K, Englander M, Keating L, Vachon J, Siskin GP. Catheter venography and endovascular treatment of chronic cerebrospinal venous insufficiency. *Tech Vasc Interventional Rad*. 2012; 15:121-130.
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