

# Evolution in quality of life and epidemiological impact after endovascular treatment of chronic cerebro-spinal venous insufficiency in patients with multiple sclerosis

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## Abstract

**Background:** We report the outcome of 67 patients after endovascular treatment of chronic cerebro-spinal venous insufficiency in patients with multiple sclerosis.

**Material and methods:** For evaluating outcome, patients were divided into three groups with respective outcome after three, six and twelve months. Assessment of outcome was done by a disease-specific quality-of-life score that reflects the physical health (physical health composite, PHC) and mental health (mental health composite, MHC) by a score.

**Results:** Improvement in PHC was significant ( $P < 0.05$ ) in the three- and six-month groups. Improvement in MHC was only significant ( $P < 0.05$ ) in the three-month group.

**Conclusion:** In conclusion, we can state that the result of endovascular treatment seems to decay although the baseline is still higher than preoperative. To confirm this finding, this study needs to be reproduced in a larger patient population.

**Keywords:** CCSVI; MS; endovascular treatment; outcome

## Introduction

Since chronic cerebro-spinal venous insufficiency (CCSVI) was described by Zamboni *et al.* in 2008, the relation of CCSVI and multiple sclerosis (MS) remains until today controversial.<sup>1-4</sup> In the last few years worldwide thousands of MS patients had endovascular treatment mostly for jugular vein and azygous vein stenosis causing CCSVI. Although there are large series published claiming that this treatment is safe, reports of outcomes after this treatment are few.<sup>5,6</sup> Individual case reports of improvement after endovascular treatment are often attributed to the placebo effect.

In this article we report the outcomes in three groups of patients with MS three, six and twelve

months after endovascular treatment. By using a validated disease-specific MS quality-of-life score (MSQoL-54) we examined whether the effect after endovascular treatment is limited in time and/or if the benefit is significant.<sup>7</sup>

## Material and methods

Between May 2010 and October 2011, 67 patients (30 men, 37 women) underwent endovascular treatment of CCSVI. Median age was 44.7 years (SD  $\pm$  13.4). There were 43 patients with relapsing–remitting MS, 11 patients with secondary progressive stage MS and 13 patients with primary progressive stage MS. Preoperative diagnosis of the venous stenoses was performed by magnetic resonance venogram. In 78% a bilateral jugular stenosis was treated, in 22% a unilateral jugular stenosis, in 57% an azygous vein stenosis and in 2% an innominate vein stenosis. All patients were treated the same way and no procedure-related complications were

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reported. Postoperatively in two patients there was re-stenosis in the six-month group.

The patients were divided at random into three groups with follow-up, respectively, after three months, six months and twelve months. This was done to eliminate cyclic variation in MS symptoms. Patient follow-up was performed with a validated MSQoL-54. This score gives an assessment of the physical and emotional condition of the MS patients: physical health composite (PHC) and mental health composite (MHC). The score is based on the physical and emotional condition of the previous four weeks.

Statistical analysis of health score after three and six months was performed using the paired Student's *t*-test.

## Results

Improvement was statistically significant ( $P$  value  $<0.05$ ) for PHC score after three and six months (Table 1). Statistical analysis of PHC- and MHC score after 12 months showed no statistically significant improvement ( $P$  value  $>0.05$ ) (Table 1). Results after six months showed a different outcome; PHC score was significant ( $P$  value  $<0.05$ ) but MHC score was not significant because  $P$  value  $>0.05$ . Owing to the small number of patients, a division in outcome for the different subtypes of MS was not possible. Median PHC- and MHC score was plotted on a curve (Figures 1 and 2).

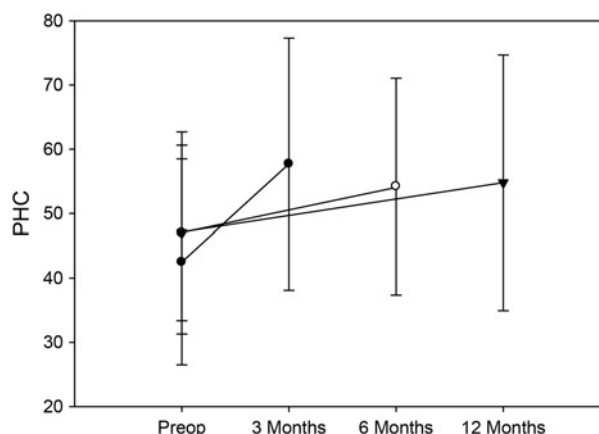
## Discussion and conclusion

Benefits in physical and emotional conditions in patients seem to be temporary and especially limited to a period of three months after the intervention. In the group of patients with outcomes after six months, we see a benefit in physical health but no longer in mental health. In the group of patients with outcomes after 12 months, we see a decay in the improvement of physical

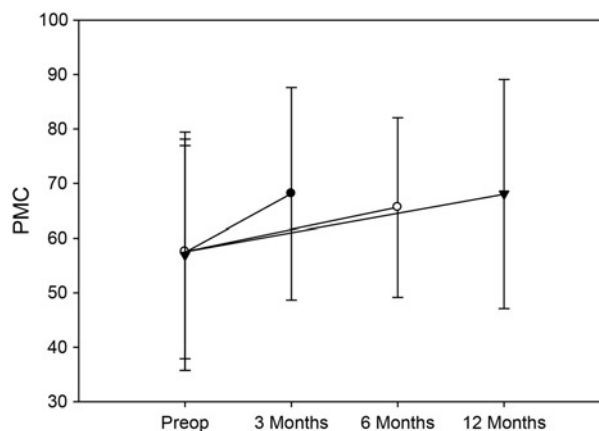
**Table 1** *P* value at three, six and 12 months for PHC and MHC after paired Student's *t*-test

	<i>P</i> value	Significance at 0.05 level
PHC 3 months	0.0011	Significant
MHC 3 months	0.0033	Significant
PHC 6 months	0.0385	Significant
MHC 6 months	0.1482	Not significant
PHC 12 months	0.1332	Not significant
MHC 12 months	0.1371	Not significant

PHC, physical health composite; MHC, mental health composite



**Figure 1** Plotted curve physical health composite



**Figure 2** Plotted curve mental health composite

and mental health. If we compare the curves of Figures 1 and 2 we conclude that the slope of the curve decreases the longer after a patient's operation and although the results are not significant ( $P > 0.05$ ), an important remark is that the slope of the curve for outcomes after one year still remains positive. For confirmation of our findings, we think that the same study needs to be performed in a larger population. A restriction in this study is that due to a limited population it was not possible to correlate the outcome after the endovascular treatment to the different MS subtypes and also to correlate the outcome to the number, localization and specific characteristics of the venous lesions.

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