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CLINICAL STUDY

LDL apheresis in the treatment of non-arteritic ischaemic optic neuropathy: a 6-month follow-up study

S Guerriero[1], G Giancipoli[1], A Cantatore[1], G Sacco[1], P Brescia[2], MT Saliani[2] and A Ramunni[2]

Abstract

Purpose **Verify the recovery of visual capacity after the administration of a combination of LDL apheresis (LA) and conventional therapy (CT). Design, prospective and interventional case series.**
Methods **20 patients affected by NAION were randomly subdivided into two groups of 10 patients (Group 1 and Group 2). Group 1 underwent three sessions of LA associated with CT, whereas group 2 received only CT. At discharge and at the 6 months follow-up visit, assessment in both groups was made of the best corrected visual acuity (BCVA) and the computerised visual field (CVF), comparing the findings with those at admission in each patient.**
Results **Only the mean deviation (MD) at CVF was statistically improved in group 1 as compared with group 2 at discharge, judged against the values at admission (-11.08 ± 6.51 *vs* -16.53 ± 10.03, $P = 0.039$; -17 ± 5.24 *vs* -14.14 ± 9.42, respectively). However, this increase was not confirmed at 6 months (-16.83 ± -10.72, group 1; -13.56 ± 3.60 group 2).**
Conclusion **In NAION, LA induced a short term improvement in the MD, but by 6 months this had disappeared.**
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Keywords: LDL apheresis; NAION; microcirculation disturbances

In non-arteritic ischaemic optic neuropathy (NAION), insufficient blood circulation within the optic nerve head has been postulated as the cause.[1,2]

Table 1 Mean deviation (MD) in the two groups

MD	*Group 1*	*Group 2*	P
Addmitted	-16.53 ± 10.03	-14.14 ± 9.42	0.61
Discharged	*-11.08 ± 6.51	-17 ± 5.24	0.05
After 6 months	-16.83 ± 10.72	-13.56 ± 3.60	0.41

*$P = 0.039$, within group, between admission, and hospital discharge.

In previous experiences, we have associated treatment with LDL apheresis and traditional therapy in patients affected by NAION, obtaining convincing results in terms of the improvement of functional parameters.[3–5]

In this study, 20 patients affected by NAION were randomly subdivided into two groups: a group of 10 patients treated with conventional therapy in combination with LDL apheresis (group 1) and a control group of 10 patients treated with conventional therapy only (group 2).

The comparison of the best-corrected visual acuity at admission, at discharge, and at 6 months in the two groups did not reveal any significant differences within groups and between groups at the times considered.

The mean deviation (MD) resulted statistically significantly improved in group 1 at discharge as compared with admission ($P = 0.039$). However, the improvement did not persist up to 6 months, but returned to the values recorded at hospital admission. Instead, in group 2, the MD remained largely unchanged at all three times considered (Table 1).

The temporary increase in the functional visual parameters that we observed after apheresis seems to be attributable to an

[1]Division of Ophthalmology, Department of Ophthalmology and Otorhinolaryngology, University of Bari, Bari, Italy

[2]Division of Nephrology, Department of Internal and Public Medicine, University of Bari, Bari, Italy

Correspondence:
A Ramunni,
Division of Nephrology, Department of Internal and Public Medicine, University of Bari, Piazza Giulio Cesare, 11, Bari 70124, Italy
Tel: +39 0805 478 383;
Fax: +39 0805 478 675.
E-mail: a.ramunni@nephro.uniba.it

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improvement in the haemorheologic parameters, sustained by a drastic reduction in the endothelial activation indexes.[5] Moreover, an improvement in the MD was also observed in our previous experiences [4,5] following treatment with LDL apheresis, but we did not prolong follow-up to 6 months. In this study, the return of the MD to the pretreatment values suggests that the temporary increase in MD could be sustained by reversible haemorheological improvements (reduced plasma and whole blood viscosity, reduced erythrocyte aggregability, and so on) obtained using LDL apheresis, that could have induced a short-term enhanced blood flow to the posterior ciliary arteries.

It has still to be seen how long these effects last and whether prolonged apheresis treatment, for more than the three sessions we administered, or repeated over time according to cycles that have still to be ascertained could achieve a definitive cure of NAION.

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