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Highlights On Cyclophosphamide Effect in Active Relapsing Remitting Multiple Sclerosis

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Background: Cyclophosphamide (CYC) is an alkylating agent which produces immunosuppression and an anti-inflammatory immune deviation. CYC is used extensively in treating aggressive and rapidly progressive forms of multiple sclerosis (MS), with mixed results. The aim of this exploratory prospective study was to determine the effect of CYC therapy given to active form of patients with relapsing–remitting MS (RRMS) for better control of clinical disease activity regarding relapse rate, disease progression, and radiological outcome.

Methods: In all, 69 patients with active RRMS were treated and followed up for a period of 12 months. Totally, 22 patients received monthly pulse doses of CYC with starting dose of 800 mg/m2 with dose augmentation to induce leukopenia of 3000/ mm3 and/or lymphopenia of 800/mm3 guided by complete blood picture 14 days after each dose plus 1 g of methylprednisolone; 23 patients received subcutaneous interferon beta-1a 44 IU three times weekly; and 24 patients received monthly methylprednisolone only. The primary outcome measure was annual relapse reduction, stabilization of disease progression (measured by Expanded Disability Status Scale (EDSS)), and decreased magnetic resonance imaging (MRI) activity measured by the presence of new T2 lesions and/or gadolinium-enhancing lesions at the end of study and during relapses as secondary outcome measure.

Results: At 12th month of therapy, CYC produced significant relapse reduction compared to pretreatment baseline state ($p < 0.001$) and to monthly methylprednisolone group ($p = 0.03$) with relative risk reduction equal to 80.2%. In comparison to interferon beta-1a, there was no significant difference ($p = 0.46$). CYC induced significant improvement in disability previously accumulated compared to pretreatment baseline state ($p < 0.001$), but no significant difference between groups ($p = 0.2$). Significant reduction in gadolinium-enhancing lesions ($p < 0.004$) was reported in CYC patients compared to pretreatment baseline state, but no significant difference between groups ($p = 0.06$).

Conclusion: CYC showed significant clinical and radiological beneficial effect on controlling RRMS activity.