Evaluation of Natalizumab biosimilar effectiveness based on prior treatment exposure: a retrospective analysis

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Objective: Intravenous Natalizumab biosimilar (NAT-BIO) (Tyruko®) represents a new frontier in the treatment of relapsing-remitting multiple sclerosis (RRMS), offering comparable efficacy to the Natalizumab originator (NAT-OR) (Tysabri®), with potential pharmacoeconomic advantages. However, real-world data evaluating its clinical effectiveness across different patient backgrounds, particularly among patients switching from NAT-OR or from other disease-modifying therapies (DMTs), remain limited. This study evaluates disability progression, relapse activity, and radiological worsening among RRMS patients initiating NAT-BIO, stratified by prior treatment exposure

Materials: This retrospective analysis was conducted on patients receiving NAT-BIO at the UOS Multiple Sclerosis Center of the University of Catania between August 2024 and January 2025. Subjects were stratified into three groups based on prior treatment status: (1) treatment-naïve patients, (2) patients who switched from NAT-OR, and (3) patients who switched from other DMTs.

Methods: Clinical and radiological data were collected, including Expanded Disability Status Scale (EDSS) scores, annualized relapse rate (ARR), percentage of patients reporting relapses, and MRI activity (presence of new/enlarging T2 lesions or gadolinium-enhancing lesions), assessed at two timepoints: within six months prior to NAT-BIO initiation (baseline) and after six months of treatment.

Results: A total of 163 patients were included: 128 (78.5%) had been previously treated with NAT-OR, 23 (14.1%) were treatment-naive, and 12 (7.4%) had switched from other DMTs. Patients switching from NAT-OR had significantly higher EDSS scores at diagnosis compared to those from other DMTs (2.08 ± 1.00 vs. 1.11 ± 0.78, p = 0.0008), and a non-significant trend toward higher scores compared to naive patients (2.08 ± 1.00 vs. 1.73 ± 1.64). Prior to NAT-BIO initiation, ARR was highest in treatment-naive patients (1.03 ± 0.43), followed by those switched from other DMTs (0.65 ± 0.12), and was 0 in the NAT-OR group (table 1). At six-month follow-up, no clinical relapses were reported in any subgroup. Baseline MRI activity was observed in 5/23 (21.7%) naive patients and 3/12 (23.1%) patients switched from other DMTs, compared to 9/128 (7.1%) patients in the NAT-OR group (p < 0.001). After six months of NAT-BIO, MRI activity dropped to 0 in both the naive and other DMT groups, while only 3/128 (2.4%) of patients who had switched from NAT-OR showed active lesions (Figures 1-2-3).

Discussion: NAT-BIO demonstrates consistent effectiveness in controlling disease activity and disability progression in RRMS patients, regardless of prior treatment status. Notably, naive patients and those switching from other DMTs exhibited comparable outcomes in terms of EDSS stability and MRI activity suppression.

Table 1. Demographical characteristics

Variable	Switched from NAT-OR 128 (78.5%)	Switched from other DMTs 12 (7.4%)	Naive 23 (14.1%)	P value (ANOVA)
Current age (yrs); mean ± SD	41.91 ± 11.11	43.67 ± 13.71	34.87 ± 11.43	0.2
Female, N (%)	61 (47.7)	6 (50)	11 (47.8)	0.1
Age at onset (yrs), mean ± SD	29.08 ± 10.11	25.62 ± 33.55	32.99 ± 10.94	0.3
Disease Duration (yrs), mean ± SD	12.83 ± 9.45	18.05 ± 33.86	1.88 ± 1.22	0.001
EDSS at diagnosis, mean ± SD	2.08 ± 1.00	1.11 ± 0.78	1.73 ± 1.64	0.0008

Figure 1. EDSS progression over time

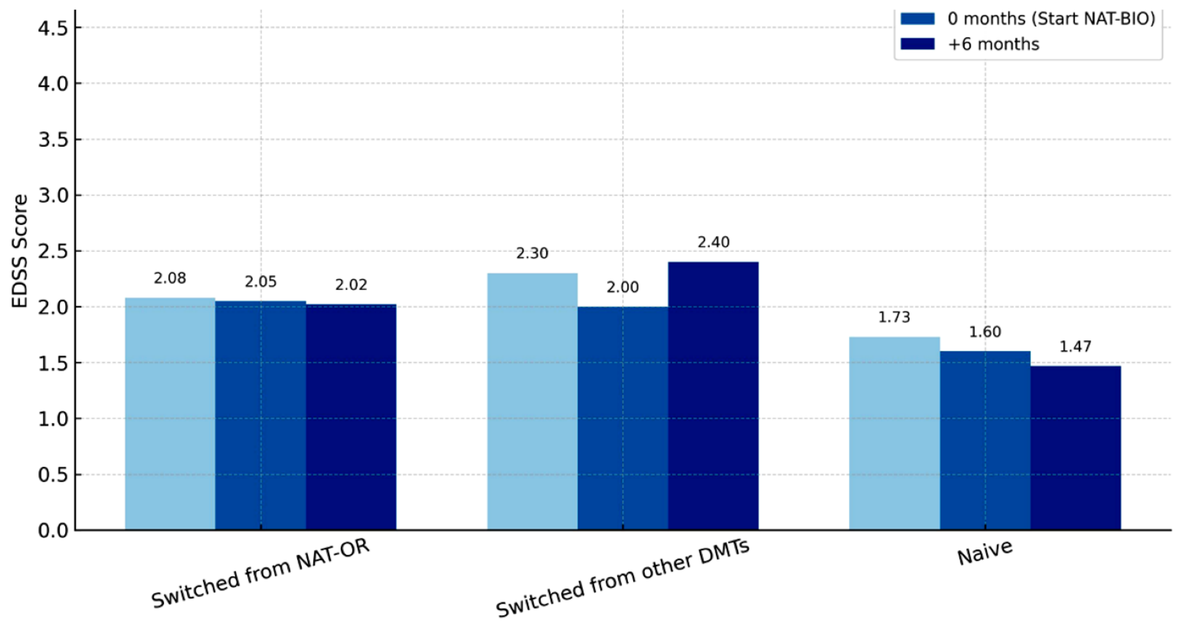


Figure 2. Clinical relapses over time

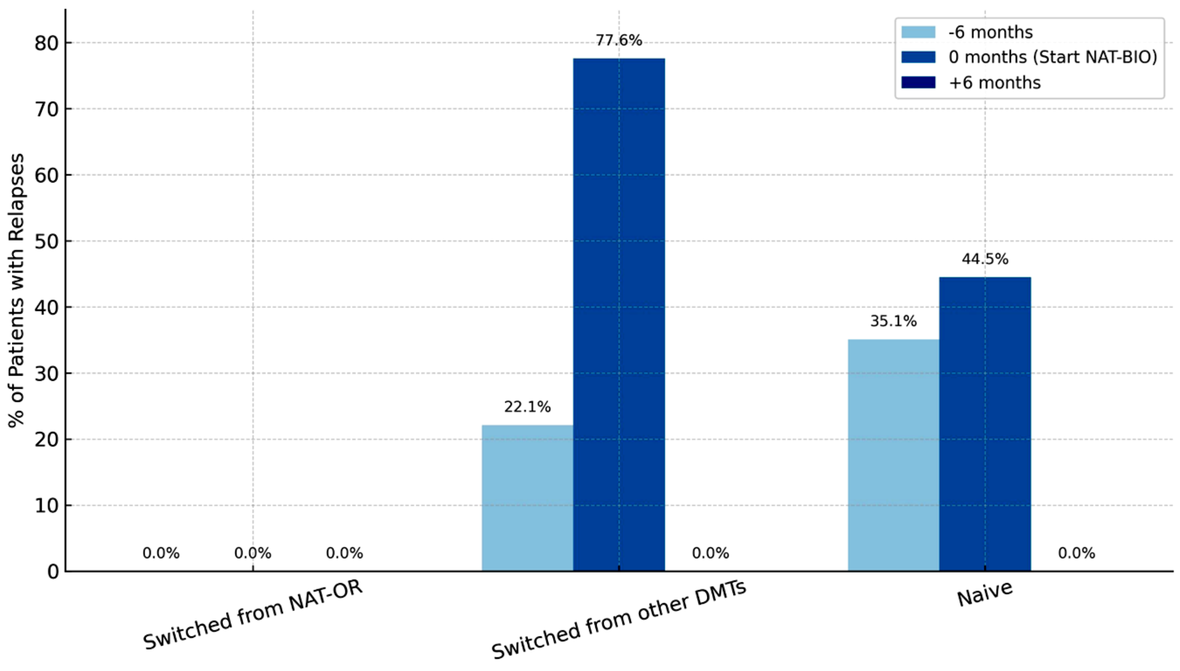
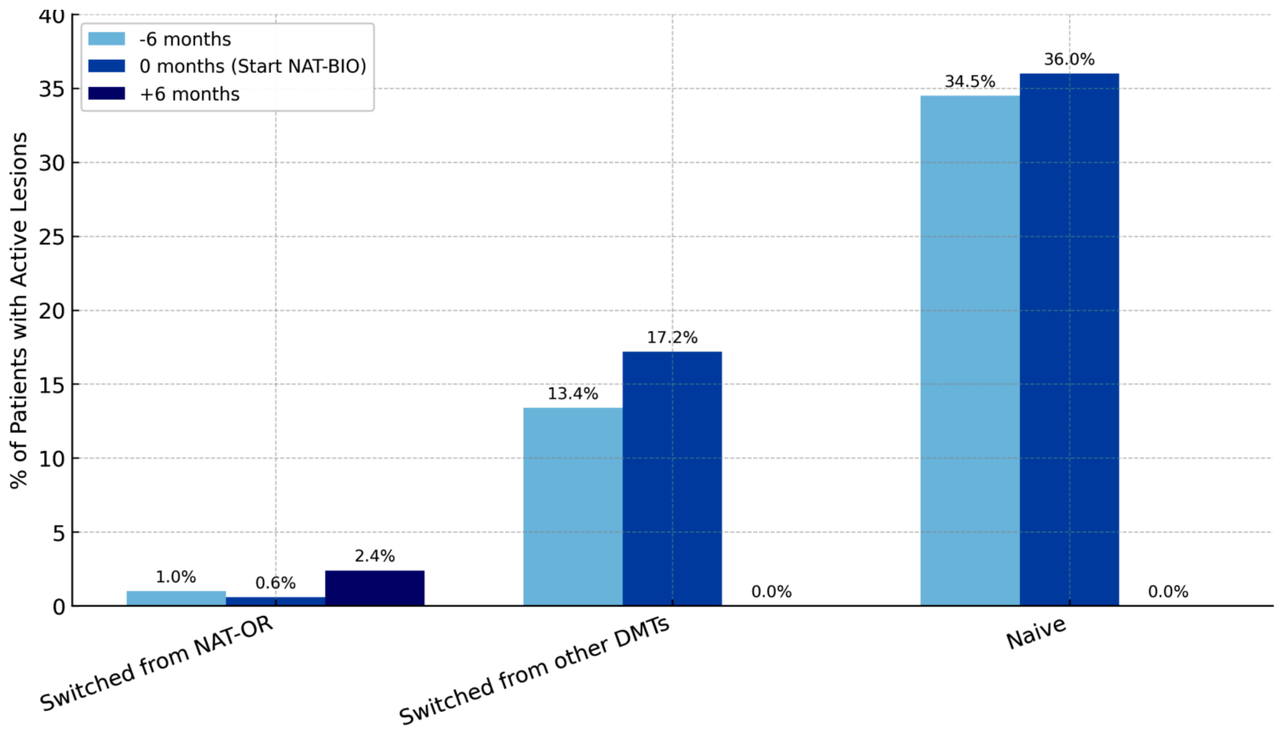


Figure 3. MRI activity over time



Conclusion: These findings support the clinical utility of NAT-BIO across a range of treatment backgrounds, reinforcing its role as a reliable therapeutic option both for initiating treatment and for transitioning from other therapies in RRMS management

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