Impact of Anti-TNF-α Therapies on the Peripheral Nervous System: A Systematic Review and Clinical Recommendations

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Objectives

Anti-TNF-α agents have significantly advanced the treatment of chronic inflammatory diseases. Nonetheless, there is growing evidence that these drugs may trigger immune-mediated polyneuropathies. The clinical characteristics, management strategies, and long-term outcomes of such adverse events remain poorly defined. This systematic review aims to provide a comprehensive overview of anti-TNF-α-associated neuropathies, integrating published data with two additional cases from our center.

Materials and methods

A total of 101 cases were analyzed: 99 identified through a systematic review of the literature and 2 observed at our institution. Data regarding clinical presentation, neurophysiological findings, therapeutic interventions, and neurological outcomes were collected. Predictive factors for poor neurological recovery were assessed using univariate and multivariate logistic regression models.

Results

Neurological symptoms typically appeared within the first 20 months of anti-TNF-α therapy (mean:12.2 ± 15.3 months) (fig.1). Infliximab was the most commonly implicated drug (63.4%). The majority of patients presented with motor involvement, either isolated (29.7%) or in combination with sensory symptoms (55.4%). Electrophysiological studies frequently showed conduction blocks (41%) and demyelinating features (39%).Axonal damage was less common (12%). In 94.8% of cases, anti-TNF-α therapy was discontinued, and 70.3% received plasmapheresis or immunomodulatory treatment, such as corticosteroids or intravenous immunoglobulin. Complete neurological recovery occurred in 39.6% of patients, whereas 31.7% developed a chronic inflammatory demyelinating polyneuropathy (CIDP)-like phenotype. Univariate analysis revealed that sensory-motor involvement, demyelination, and conduction blocks were associated with worse outcomes (fig.2). In multivariate analysis, sensory-motor involvement remained a significant independent predictor of poor prognosis (OR = 5.14; 95% CI: 1.24-1.34; p= 0.024). Among patients re-exposed to anti-TNF-α agents, 7 experienced symptom recurrence, while 2 who underwent dose reduction or switched to a different agent did not relapse.

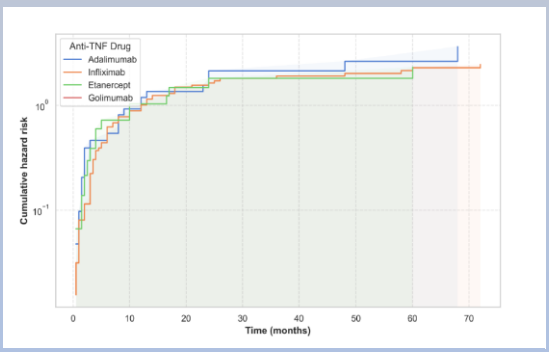

Figure 1

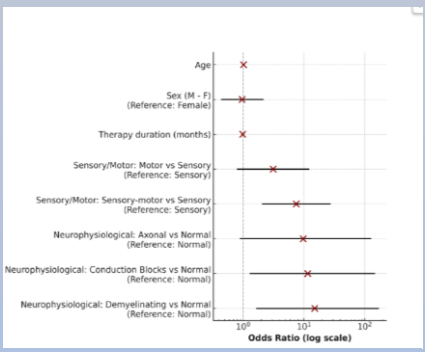

Figure 2

Conclusions

Anti-TNF-α-induced neuropathies are typically characterized by a motor-predominant and demyelinating pattern, with a significant proportion progressing to chronic forms despite treatment discontinuation and immunotherapy. Sensory-motor involvement is a key predictor of poor outcome. Rechallenge should be undertaken with caution, and close monitoring is essential when reintroduction is considered.

References

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