

Association of inflammatory markers with the clinical phenotype and prognosis of Guillain-Barré Syndrome

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Introduction

❑ Guillain-Barré syndrome (GBS) : an autoimmune polyradiculoneuropathy ➡ The most common cause of acute neuromuscular paralysis worldwide

❑ Pathogenesis of GBS ➡ Not completely understood

➡ Role of complement activation and inflammation

✓ **Inflammatory markers:** CRP, Neutrophil count, Monocyte count

✓ **Blood cell ratios**

Neutrophil-to-lymphocyte ratio (NLR)

Monocyte-to-lymphocyte ratio (MLR)

Platelet-to-neutrophil ratio (PNR)

Relevance in GBS ?

Objective: To determine the association of these markers with the clinical phenotype and outcomes in patients with GBS

Patients and Methods

❑ **Prospective study** since January 2022 ➡ Inclusion of **patients from the Neurology department with a GBS diagnosis**

❑ Collection of the results of inflammatory markers at admission: **CRP** and **complete blood count (CBC)**

➡ Calculation of **blood cell ratios:** NLR, MLR, MNR, PNR, and PLR

❑ Collection of blood samples at admission ➡ Assessment of serum levels of **C3 and C4 complement fractions** using turbidimetry (Optilite®)

*Normal values: **C3:** 0.65-1.45 g/L ; **C4 :** 0.1-0.4 g/L*

❑ **Evaluation of clinical severity** : monthly, using the GBS Disability Score (GDS), during a six-months-follow-up period

Results

40 patients

- Median age: 50.3 years
- Sex-ratio M/F: 1.35

➔ **Initial severity**

➔ CRP higher in females (10.37 mg/L vs. 3.23 mg/L, $p=0.006$) and positively correlated with age ($r=0.450$, $p=0.005$)

➔ Lymphocyte count inversely correlated with age ($r=-0.386$, $p=0.017$)

➔ **No significant associations with**

- Prodromic infections (diarrhea or upper respiratory tract infections)
- Cranial nerve abnormalities
- Clinical form of the disease (pure motor or sensorimotor)

Prognosis : None of the studied inflammatory markers was associated with the need for intensive care unit hospitalization or long-term recovery at six months

➔ MRC score inversely correlated with C3 levels ($r= -0.528$, $p=0.01$)

➔ GDS correlated with

- CRP ($r=0.366$, $p=0.026$)
- absolute neutrophil count ($r=0.355$, $p=0.029$)
- NLR ($r=0.346$, $p=0.034$)
- PNR ($r= -0.394$, $p=0.037$)

➔ Severe presentation GDS >3 associated with

- ❖ Higher CRP ($p=0.039$)
- ❖ Higher NLR ($p=0.02$)
- ❖ **Higher C3 ($p=0.048$)**

➔ The best parameter indicating a severe GBS at admission (area under the curve=0.861, $p=0.027$)

Discussion

- ❑ **CRP** is a marker for initial severity and short-term prognosis (1) ↔ Our study : C3 is superior to CRP in predicting initial severity
- ❑ **C3 is a marker of initial presentation and worse prognosis** according to a recent study (2)
- ❑ **Blood cell ratios** : potentially valuable, quick, cost-effective, and sensitive indices for assessing stress and inflammation (3)
- ❑ **NLR** is associated with initial severity (4)

Conclusion

- Our study : Elevated levels of CRP, C3, and a higher NLR were associated with initial severity ➔ C3: a valuable marker for stratifying GBS patients ?
- Interest in long term prognosis ? ➔ Other studies with bigger patients' samples

References

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