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Inflammatory predictors of intraocular pressure elevation in neovascular glaucoma secondary to retinal vein occlusion

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Objective: To evaluate inflammatory biomarkers and integral inflammatory indices as predictors of intraocular pressure (IOP) elevation in patients with neovascular glaucoma (NVG) secondary to retinal vein occlusion (RVO).
Methods: The study included 88 participants: 52 patients with NVG following RVO and 36 age-matched controls. Assessments included best-corrected visual acuity (BCVA), IOP, systemic arterial pressure, prevalence of arterial hypertension (AH), complete blood count parameters, ICAM-1 (CD54) levels, and the systemic inflammatory response index (SIRI). Statistical analysis employed the Mann–Whitney U-test, χ^2 test, Spearman's correlations, and multivariate regression.
Results: Patients with NVG demonstrated significantly higher IOP (39 [36–44] vs 17 [15–18] mmHg; p=0.0003) and markedly reduced BCVA (0.02 vs 1.0; p=0.0003). AH was more prevalent in the NVG group (87% vs 39%; p=0.0001).
Inflammatory activation was prominent: ICAM-1 (CD54) levels were almost three times higher in NVG compared with controls (646 [555–755] vs 216.5 [186.5–233.5] cells/μL; p=0.0003), and SIRI was more than doubled (0.98 [0.66–1.07] vs 0.44 [0.41–0.53]; p=0.0003). Neutrophils and monocytes were elevated, while lymphocytes were decreased (all p<0.01).

IOP correlated strongly with ICAM-1 (CD54) (r_s=0.63), SIRI (r_s=0.73), mean arterial pressure (r_s=0.56), and pain intensity (r_s=0.79).

Multivariate regression (Adjusted R^2=0.88; p<0.0001) confirmed ICAM-1 (CD54), SIRI, and mean arterial pressure as independent predictors of elevated IOP.

Conclusion: ICAM-1 (CD54) and SIRI reflect a pronounced inflammatory state in NVG following RVO and independently predict IOP elevation. Their combined assessment enhances early risk stratification and may support timely therapeutic decision-making.

Disclosure of Interest: None Declared