

HEMOSTATIC AND CARDIOVASCULAR PROFILES IN HEMOPHILIA PATIENTS WITH AND WITHOUT ATHEROSCLEROSIS

A. Napolitano, E. Zanon, L. Spiezia, G. Camporese, P. Scarinzi, F. Ahmad, G. Saggiorato, C. Bulato, S. Toffanin, S. Gavasso, F. Sartorello, C. Simion, E. Campello, P. Simioni

Hemophilia Center, University Hospital of Padua, Italy

Background and Aims. Although hemophilia is characterized by a hypocoagulable state, patients remain susceptible to atherosclerosis due to traditional cardiovascular risk factors. The relationship between atherosclerosis, global hemostasis, and platelet function in hemophilia remains poorly defined. This study compared clinical characteristics, laboratory findings, thromboelastometric parameters (ROTEM), and platelet function profiles in patients with hemophilia A and B with and without atherosclerosis, and explored potential hemostatic differences associated with vascular disease.

Materials and Methods. This cross-sectional study enrolled 105 adult patients with hemophilia A and B from the Hemophilia Centers of Padua and Castelfranco Veneto, Italy. Seventy-seven patients had no evidence of atherosclerosis and 28 had documented disease. Atherosclerosis was defined by carotid stenosis $\geq 50\%$, aortic plaque, or ABI ≤ 0.9 . Clinical data, routine laboratory tests, ROTEM, and Multiplate assays were collected. Group comparisons were performed using the t-test, Mann-Whitney U test, or χ^2 test.

Results. Patients with atherosclerosis were older (63 ± 12.4 vs. 55.5 ± 10.9 years; $p = 0.007$) and had a higher prevalence of hypertension (60.7% vs. 33.7%; $p = 0.013$), dyslipidemia (75% vs. 35%; $p < 0.001$), antihypertensive therapy

(53.6% vs. 28.6%; $p = 0.018$), lipid-lowering therapy (46.4% vs. 16.9%; $p = 0.002$), and previous cardiovascular or cerebrovascular events (28.6% vs. 6.5%; $p = 0.002$). No differences were observed in hemophilia type or severity, obesity, diabetes, alcohol use, or inhibitors. Most laboratory parameters, including hemoglobin, platelet count, renal function, lipid profile, Lp(a), hs-CRP, and HbA1c, were comparable. NT-proBNP was significantly higher but remained within the normal range. ROTEM showed shortened INTEM CT (254.9 ± 47.8 vs. 294.3 ± 140.1 sec; $p = 0.04$) and increased FIBTEM MCF (14 ± 3.7 vs. 12.2 ± 3.6 mm; $p = 0.031$), suggesting subtle procoagulant changes. EXTEM parameters and Multiplate ADP/ASPI assays did not differ significantly. Kaplan-Meier analysis showed no difference in survival between groups ($p = 0.93$) (Figure 1).

Conclusions. Despite inherited hypocoagulability, patients with hemophilia and atherosclerosis exhibit classical cardiovascular risk factors. ROTEM detected subtle procoagulant changes, including faster clot initiation and increased fibrin-based clot firmness. These findings highlight the importance of assessing both cardiovascular risk and global hemostasis in hemophilia and support ROTEM as a sensitive tool for identifying early coagulation alterations associated with atherosclerosis.

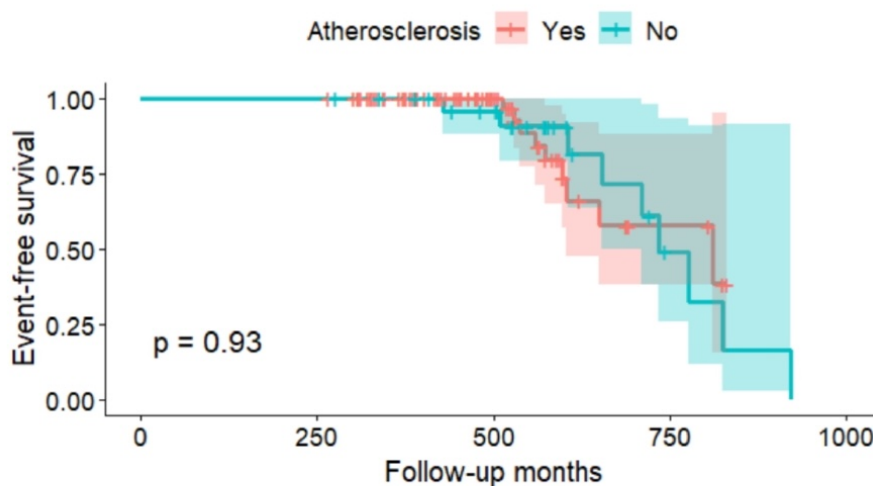


Figure 1. Survival curves in patients with and without atherosclerosis
in patients with hemophilia A and B