

Association of Increased Plasma Fibrinogen Concentration Due to Polymorphism in FGG Gene with Free Flap Thrombosis in Microvascular Surgery

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Introduction. For repair of damaged tissues due to trauma, burns, chronic inflammation or malignancies, free flap microvascular surgery is used. Thrombosis is the main subject of concern seen in reconstructive surgery. Hyperfibrinogenemia as a factor posing milieu for hypercoagulable state could indicate early monitory sign for potential thrombosis.

Aim, Materials and Methods. The aim of the present study was to evaluate plasma fibrinogen increase due to single nucleotide polymorphism (SNP) in Fibrinogen gamma chain (FGG) gene and association of increased plasma fibrinogen concentration with free flap thrombosis. 95 patients undergoing free flap microvascular surgery were enrolled in observational case control study. Plasma fibrinogen concentration, single nucleotide polymorphism rs2066865 (G > A) in FGG gene, platelet count were analysed. Thromboelastometry (ROTEM) was performed for MCF (Maximal Clot Firmness) Fibtem, MCF Intem and FPR (fibrinogen / platelet ratio) evaluation. Patients demographic data as well as history of comorbidities and family history were collected.

Results. In 18/95 (19%) patients, free flap thrombosis occurred with complete failure in 15/95 (16%). We found 20 patients out of 95 with FGG gene mutation, 16/20 were heterozygous (A/G) and 4/20 were homozygous (A/A) for polymorphism rs2066865. Patients with SNP in rs2066865 (G > A) in FGG gene had higher plasma fibrinogen concentration (G/G - 3.9 g/L ± 1.15; G/A - 4.75 g/L ± 1.31; A/A - 6.11 g/L ± 1.41) even in time period overrun 30 days (recent trauma time period). In 4/20 patients with FGG gene mutation thrombosis with complete flap failure eventuated, all were heterozygous (G/A). In all 20 patients, thromboelastometry confirmed increased MCF Fibtem values (G/A - 27.77 ± 12.02; A/A - 29.75 ± 6.24).

Conclusion. Higher plasma fibrinogen concentration was found in patients with single nucleotide polymorphism rs2066865 (G > A) in Fibrinogen gamma chain gene; however, no clear association with increased risk for thrombosis in free flap surgery was found. Further data and larger sample size are needed.