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Assessment of Bleeding Time by Platelet Function Analyser-100 Closure Times

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Background: In recent years, platelet function assay 100 (PFA-100) was introduced to measure platelet function. PFA-100 is superior to conventional methods in sensitivity and specificity. In addition, it is less invasive and relatively simple technique. The present study was aimed to investigate the risk factors for platelet dysfunction by using platelet function analyzer (PLA 100®).

Methods: The study was conducted in retrospective between March 2008 and February 2011 and the subjects consisted of 435 patients scheduled for various types of surgery and patients with renal dysfunction. We checked the hemoglobin, hematocrit, platelet count, BUN, creatine, electrolyte, parathyroid hormone and estimated Kt/V, glomerular filtration rate, serum nitric oxide, tumor necrosis factor-alpha (TNF-a). By using platelet function analyzer (PLA 100®), we estimated bleeding time. The test is to expose platelets within citrated whole blood to high shear (5,000 to 6,000/sec) within a capillary tube and monitor the drop in flow rate as the platelet form a hemostatic plug within the center of a membrane coated with collagen and either ADP or epinephrine.

Results: Bleeding time of the patients was distributed from 61 to 300 seconds, average was 153 seconds. Bleeding time was more prolonged as lower the GFR ($n=435$, $r=0.166$, $p<0.01$), less the Hgb ($n=435$, $r=-0.136$, $p<0.01$) and less the Hct ($n=435$, $r=-0.132$, $p<0.01$) Accordingly, correlation between each factor and bleeding time was observed.

Conclusion: Our results confirmed bleeding time measured directly in the plasma of patients is associated with glomerular filtration rate and anemia.

Future studies will be required to elucidating a mechanism of uremic bleeding. It would be challenging to investigate the relation between bleeding time and well known cytokines associated with uremic bleeding such as nitric oxide or tumor necrosis factor-alpha.

Key Words: 요독성 출혈, 혈소판기능장애, PFA-100
Uremic bleeding, Platelet dysfunction, PFA-100