A Simple Point of Care Method for Assessment of Platelet Function at the Bedside Using the ICHOR Device

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There is a current clinical need for a point of care device to assess platelet function in patients receiving platelet Gp IIb/IIIa receptor blocker therapy for better safety and efficacy. Unfortunately, the traditional methods are suboptimal. The purpose of this study is to assess the feasibility of assessing platelet function as measured by platelet aggregation inhibition, using the ICHOR hematology analyzer in patients undergoing coronary angioplasty and were treated with tirofiban.

Methods: The study was conducted at Ben Taub General Hospital, an affiliated hospital of Baylor College of Medicine. Twelve patients undergoing coronary angioplasty for acute coronary syndromes and treated with tirofiban (0.4 µg/kg/min loading dose for 30 minutes and 0.1µg/kg/min for 12 – 24 hours maintenance infusion) were recruited. Blood samples were collected from the arterial sheath while in place and from a peripheral intravenous catheter after sheath removal. Platelet aggregation was tested before tirofiban infusion, after completion of the bolus infusion, at 4 hours, before discontinuation and 2 hours after the infusion was discontinued. Four different platelet agonists were used: ADP, ristocetin, epinephrine and collagen.

Results: The mean age of the patients enrolled was 52 ± 3 years. Coronary angioplasty of the LAD was performed in 6 patients, RCA in 4 patients and of the circumflex in 2 patients. Baseline studies showed a mean platelet aggregation of 65%, 86%, 88%, and 70% in response to ristocetin, ADP, epinephrine and collagen, respectively. The percentage of aggregable platelets decreased to 10%, 24%, 15% and 24% when stimulated with ristocetin, ADP, epinephrine and collagen following the tirofiban bolus infusions. This effect was maintained at 4 hours and before the discontinuation of the infusion at a mean of 17 hours. Platelet function recovered partially 2 hours after discontinuation of tirofiban with mean percent platelet aggregation of 46%, 55%, 49% and 57% as measured with the same agonists. A heterogenous response was noted when testing platelets with different patients with the same agonists in the presence or absence of tirofiban.

Conclusion: The ICHOR hematology analyzer is a simple, rapid bedside method that may have clinical utility in assessing platelet aggregability in patients undergoing coronary angioplasty who are treated with Gp IIb/IIIa receptor blockers.

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