Significance of Platelet-Derived Microparticles in Uremia

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Dear Sir,

Hypercoagulability and platelet hyperaggregability have been described in chronically uremic patients undergoing regular dialysis [1, 2]. It has also been reported that vesicles derived from the platelet plasma membrane, known as microparticles (MP), can be detected in platelets activated by collagen or in the blood of patients with intravascular platelet lysis [3]. The functional significance of these platelet-derived MP is of considerable interest, because they are rich in membrane receptors for coagulation factor Va and provide a catalytic surface for the prothrombinase reaction [4].

We measured MP levels in plasma obtained from 18 uremic patients and 10 normal control subjects using flow cytometry [4, 5]. We also studied the binding of an anti-CD62 (GMP-140) antibody (CLB-thromb/6; Im-munotech, Marseille) to their platelets using flow cytometry [5]. The MP level in uremic patients was significantly higher than that of normal subjects (uremia: $37.4 \pm 10.3\%$, normal $8.6 \pm 4.2\%$, $p < 0.001$). Glycoprotein (GP) IIb/IIIa and GPIb were detected on the surface of these MP, suggesting that the particles were derived from platelets. The percentage of platelets positive for the anti-CD62 antibody was also significantly higher in uremic patients than in the normal subjects (uremia: $42.1 \pm 13.3\%$, normal: $14.3 \pm 6.2\%$, $p < 0.01$).

Hypercoagulability is routinely observed in chronically uremic patients [6, 7]. Damage to the vascular endothelium secondary to the accumulation of toxins in renal failure activates endogenous coagulation factors, and

both uremic dyslipoproteinemia and increased platelet sensitivity are also thought to enhance blood coagulation [8, 9]. The activation of platelets is accompanied by the surface expression of new antigens, the best characterized of which are the conformationally altered platelet-specific integrin GPIIb/IIIa and the granule membrane protein GMP-140 [10].

In the present study, we showed that the plasma level of platelet-derived MP was increased in uremic patients. The role of these MP is currently unknown. However, the high level of binding of the anti-CD62 antibody to uremic platelets suggested that the MP were released from activated platelets and may participate in producing the hypercoagulability of uremia.

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