Pharmacodynamic of bovine and porcine heparins on patients under renal dialysis

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Heparin from bovine intestine has higher degree of heterogeneity when compared to porcine heparin mostly due to high proportion of 6-O-desulfation of the α-D-glucosamine units. As a consequence of this structural modification, bovine heparin has a significant lower anticoagulant activity than porcine heparin (Thromb. Haemostas. 103:1005-1015, 2010). We now evaluate the therapeutic response of these two distinct heparins on patients undergoing renal dialysis. The patients (n = 17) alternated bovine and porcine heparins for 3 consecutive dialysis sessions. Heparin was administered as a single intravenous dose at the beginning of the procedure, and blood samples were collected before and at different times after heparin injection. Plasma concentration was estimated based on the APTT assays. These two heparins differ on their anticoagulant response (as international units of anticoagulant activity, UI mL⁻¹) and on their concentrations on weight basis (µg mL⁻¹). Maximal plasma concentrations of 1.63±0.44 and 2.15±0.56 on UI mL⁻¹ basis and of 15.33±4.14 and 9.56±2.49 µg mL⁻¹ on weight basis were observed for bovine and porcine heparins, respectively. These two heparins did not differ on their half life time (t₁/₂ of 133±18 and 137±14 min for bovine and porcine heparins, respectively). These results reflect the significant lower anticoagulant activity of bovine compared with porcine heparin, which requires higher doses to achieve the same effect. Furthermore, our date confirms that the anticoagulant activities of pharmaceutical grade heparin from bovine intestine available in Brazil are misestimated (~25% lower than the declared activity). Nevertheless, these two heparins shows similar pharmacodynamic in renal patients.

Keywords: bovine heparin, porcine heparin, anticoagulant activity.
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