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PLASMA FREE HEMOGLOBIN CLEARANCE BY HEMOCOR HPH® HEMOCONCENTRATOR AND OTHER COMPETITIVE DEVICES

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Increased plasma hemoglobin (Hb) is often observed in bypass surgery and ECMO patients. Hb, after exceeding the capacity of its detoxifying system, triggers many pathologic reactions and poses a high risk to coronary artery endothelium. Our previous study showed ineffectiveness of cellulose-based hemodialyzers in Hb removal. The present *ex vivo* study examined free Hb clearance by clinically accepted polysulfone-based hemoconcentrators; Hemocor HPH® 1400 (Minntech Corp.), Capiox® HCO5 (Terumo Corp., Tokyo, Japan) and Senko CF11 (Senko Medical Trading Co., Tokyo, Japan). All experiments mimicked the 2-hour human bypass surgery procedure, scaled down to a 1.5 L model, using standard blood and ultrafiltrate flow rates with sampling times: 0.0, 0.25, 0.5, 1 and 2 hours. Baseline Hb level in the hemoconcetrator circuit was 0.7±0.03 g/dL. Results indicate that Hemocor HPH® was superior to the other tested devices. While Hemocor HPH® eliminated more than 90% of Hb after 2 hours (y=1.374 x X^(1.022), R^2=0.986), the Capiox® HCO5 and Senko CF11 cleared less than 16% (p<0.001, y=0.498 x X^(0.875), R^2=0.982) and 48% (p<0.001, y=0.733 x X^(0.940), R^2=0.993), respectively. No tested polysulfone membranes affected the physico-chemical properties of Hb with respect to its tetrameric conformation, heme stability and oxidation, and ferryl-Hb species formation.