Ticagrelor Removal With Intraoperative Polymer Bead Hemoadsorption in Patients Undergoing Urgent Coronary Artery Bypass Grafting

Background: Patients on ticagrelor undergoing urgent cardiac surgery are at high risk for perioperative bleeding complications. We measured ticagrelor levels before and after cardiopulmonary bypass (CPB) to determine whether intraoperative hemoadsorption can actively remove ticagrelor in patients undergoing urgent cardiac surgery.
Methods: The hemoadsorption cartridge was incorporated in the CPB circuit and remained active for the duration of the pump run. Blood samples were collected before and after CPB. The main objective of the current analysis was to compare mean total plasma ticagrelor levels (ng/mL) at baseline with ticagrelor levels obtained at the end of CPB. Plasma ticagrelor levels were measured at a certified outside laboratory (Altascience, Laval, QC, Canada). Data are presented as mean ± SD.
Results: A total of 11 patients undergoing urgent CABG at 3 institutions were included (mean age 67.9±9.8 years, 91% male, mean EuroSCORE-II of 3.0±3.3% (range: 0.7-12.4%). Mean intraoperative hemoadsorption duration was 97.1±43.4min with a mean flow rate through the device of 422.9±40.3mL/min. Mean ticagrelor levels pre-CPB were 103.5±63.8ng/mL compared with mean post-CPB levels of 34.0±17.5ng/ml, representing a highly significant 67.1% reduction (P<0.001, Figure). Sites reported that the intraoperative integration of the device was simple and safe without any device-related adverse events reported.
Conclusions: This is the first in vivo report demonstrating that intraoperative hemoadsorption can efficiently remove ticagrelor and significantly reduce circulating drug levels. Whether active ticagrelor removal can reduce serious perioperative bleeding in patients undergoing urgent cardiac surgery is currently evaluated in the double blind, randomized Safe and Timely Antithrombotic Removal – Ticagrelor (STAR-T) trial.

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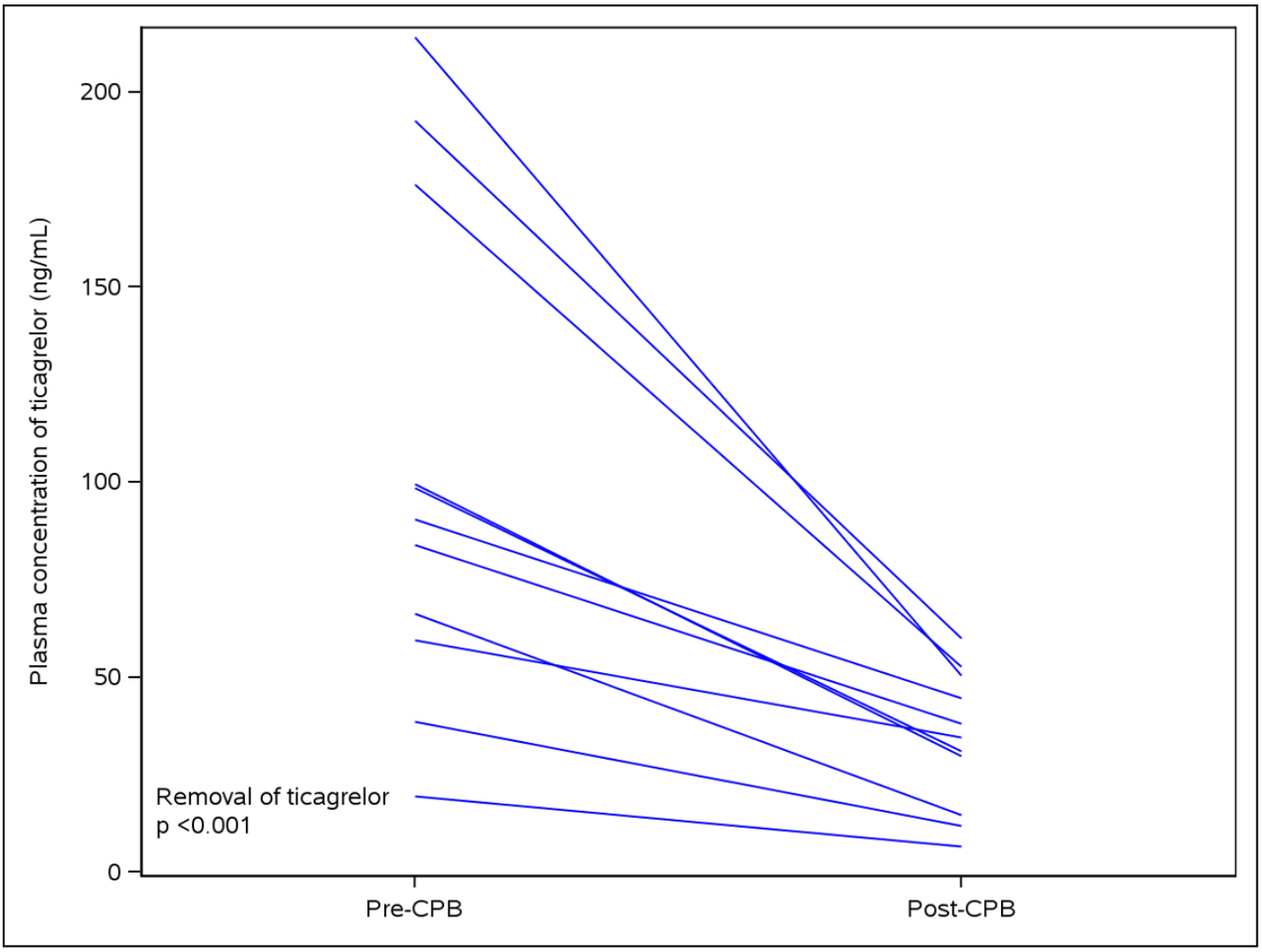
Plasma concentration of ticagrelor (ng/mL)
200
150
100
50
0
Removal of ticagrelor
p <0.001
Pre-CPB
Post-CPB