Letter to the Editor

Comment on: *Early recovery pathway for hepatectomy: data-driven liver resection care and recovery*

Annabel Blasi, Joan Beltran

Department of Anesthesia, Clinic Hospital, Barcelona, Spain

Correspondence to: Annabel Blasi. Department of Anesthesia, Clinic Hospital, Barcelona, Spain. Email: ablasi@clinic.ub.es.

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We read with great interest the paper "*Early recovery pathway for hepatectomy*: *data-driven liver resection care and recovery*" by Warner *et al.*, in which the authors review the data behind enhanced recovery pathways preceding and following hepatectomy. The article formulates a pathway for practice based on data and allows a rational order set for an efficient practice (1). However, we think that the recommendations regarding fresh frozen plasma (FFP) transfusion are not supported by scientific data or by clinical evidence.

Firstly, prothrombin time (PT), expressed as the international normalized ratio (INR) by the authors helps assess liver function but not predict the risk of bleeding (2). The increase of the PT reflects a decrease in pro-coagulant factors without taking into account the state of anti-coagulant factors. Patients with hepatectomy have low levels of pro- and anti-coagulant factors as the liver synthesizes both. Consequently, the assumption that prophylactic correction of this parameter helps prevent bleeding does not make sense.

Secondly, complete correction of the PT by FFP transfusion is rarely achieved (3,4). The doses used recommended by the authors for FFP transfusion are not those supported by current guidelines (5). Additionally, thrombin generation was unaffected by FFP transfusion and in non-bleeding critically ill patients with a coagulopathy assessed by standard coagulation test, FFP transfusion failed to induce a more procoagulant state (6).

Thirdly, the use of FFP is associated with a number of adverse effects. For instance, acute lung injury may occur in up to 30% of critically ill patients which prolongs mechanical ventilation and intensive care unit length of stay; even it may cause bleeding by increasing volume load (7).

Finally, patients that undergo liver resection are at a particularly high risk of venous thromboembolism (VTE). This is mainly due to reduced production of the endogenous anticoagulants (protein C, protein S and antithrombin), plasminogen, tissue factor pathway inhibitor (TFPI), together with increased levels of factor VIII, von Willebrand factor (vWF), soluble P-selectin and plasminogen activator inhibitor-1 (PAI-1), none of them reflected by PT (8). Recent evidence clearly indicates a direct relationship between the magnitude of hepatectomy and postoperative rates of VTE. Whereas the PT may indicate hypocoagulability (9), thromboelastometry reveals hypercoagulability in the majority of the subjects after hepatectomy for living donor liver transplant despite low molecular weight heparin prophylaxis (9). Overall, the imbalance between pro- and anticoagulant factors results in a prothrombotic environment in the early postoperative period (8) and these findings have led to recommendations of postoperative VTE prophylaxis for patients that undergo liver surgery (10).

Given the aforementioned considerations, we believe that preventive administration of FFP in order to correct the PT should not be applied routinely. Only a randomized trial could elucidate the beneficial effect of this practice but clinical evidence strongly supports that FFP transfusion could be safely omitted, which also avoids side effects, in this clinical context.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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