Bleeding news

Prothrombin complex concentrate in cardiac surgery for the treatment of coagulopathic bleeding

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Coagulopathy following cardiac surgery is associated with a significant transfusion of blood products and a high morbidity and mortality.

This review includes 18 studies (4993 patients). Two randomized clinical trials (151 participants) and 16 non-randomized studies, 14 of which retrospective, one prospective and one case report.

The review establishes two comparisons:

1- PCC versus standard therapy

2- PCC versus activated recombinant factor VII

They found that PCC seems to reduce the number of transfused red blood cell units. This fact is supported by moderate-quality evidence emerging from randomized clinical trials, as well as low-quality evidence based on non-randomized studies.

PCC can result in little to no difference in the incidence of post-oeprative bleeding, in the incidence of thrombotic events, in mortality, in the stay in the ICU, and in the incidence of requiring renal replacement therapy, when compared to standard therapy with frozen fresh plasma.

PCC leads to a more significant decrease in the total packed red blood cells transfused, if compared to activated recombinant factor VII. The quality of this evidence is considered to be moderate.

The use of PCC has little to no effect in thrombotic events, mortality, drainage production, stay in ICU, or incidence of extrarenal purification therapy when compared to factor VII, and the quality of the evidence is very low.

All studies but one are associated with cardiac surgery, with participants representative of the general population, but not the high-risk patient category, which should probably be the target population.

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The studied pediatric population underwent surgery for high-complexity congenital conditions, and the doses applied there were higher than the ones used in studies with adult patients, with no evidence of thrombotic event increase.

IMPLICATIONS FOR THE CLINICAL PRACTICE

PCC could be an alternative to the standard therapy in coagulopathic bleeding following cardiac surgery. The optimal safe dose is still uncertain. The range in adults in the reviewed studies ranges from 12 to 28 UI/ kg. In the pediatric population, doses ranged from 25 to 57 UI/Kg.

There is a hypothetical increased risk of thrombosis with the use of 3-factor PCC, since it does not include C and S proteins.

The authors believe there is little benefit from the use of PCC in patients undergoing low-risk cardiac surgery. Patients subject to long periods of extracorporeal circulation, deep hypothermia, and prosthetic material, such as an aortic graft, are the ones who can benefit more from the use PCC.