Comment on Sensebé et al, page 862

The more the better?

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Sensebé and colleagues found that a transfused platelet dose of 1 \( \times 10^{11} \) /10 kg body weight compared with 0.5 \( \times 10^{11} \) /10 kg in patients receiving treatment for acute leukemia or autologous stem cell transplantation results in a prolongation of the time until platelet counts decline again to 20 000/\( \mu \)L, by 40% (from 63 hours to 95 hours) (Figure 1).

Together with the results of previous trials,\(^1\) this study provides further evidence that the empirically defined standard dose of a therapeutic unit of platelets may be suboptimal in some patient groups. Interestingly, at the end of the study, patients in the high-dose treatment arm received a mean of 25% more platelets than patients receiving the standard dose (18.5 \( \times 10^{11} \) vs 14.9 \( \times 10^{11} \)). Although this did not reach statistical significance, the study seems to be underpowered for this end point. As prophylactic platelet transfusions have a major impact on hematology budgets and workload, the benefits of higher dose treatment should be balanced against any potential cost increases. In any outpatient setting of platelet transfusion—dependent patients, prolongation of transfusion intervals would have major relevance for improving quality of life. However, precaution should be given to the role of platelets as a scavenger of thrombopoietin.\(^2\) Giving more platelets may reduce patients’ own thrombopoietin levels, resulting in a negative feedback on thrombopoiesis. As patients in the study of Sensebé and colleagues were followed for 336 hours only, no clear conclusion can be drawn about the long-term effect on thrombocytopenia, and results of the present study may not be generalizable to other patient populations.

The study design also followed a strategy of prophylactic platelet transfusion using a threshold of 20 000 platelets/\( \mu \)L; whereas, a trigger of 10 000 platelets/\( \mu \)L seems to be safe for platelet transfusions.\(^3\) However, it is still questionable whether an approach using any prophylactic platelet count trigger is superior to a strategy of transfusing platelets only when bleeding symptoms are present.

Platelet transfusion in AML and autologous stem cell transplantation. Schematic presentation of the randomized platelet transfusion trial and its major outcomes. Patients with acute myeloid leukemia or autologous stem cell transplantation received either the standard dose of 0.5 \( \times 10^{11} \) platelets/10 kg b.w., or a higher dose of 1 \( \times 10^{11} \) platelets/10 kg b.w. The high dose group had longer periods until the trigger of 20 000 platelets/\( \mu \)L was reached but received numerically more platelets.

Many resources in transfusion medicine have been used to improve the safety of blood products with impressive achievements, especially in regard to the transmission of HIV and hepatitis C. In fact, the new approaches to increase safety of blood products such as pathogen inactivation cannot be assessed in clinical trials using the most clinically important end point (reduction in pathogen transmission), because of its very low incidence. In contrast, data from the 101 patients randomized by Sensebé et al suggest that a higher dose of platelets might have an impact on bleeding complications. This raises the question how to use resources, i.e., whether a patient with acute myeloid leukemia is more threatened by viral or bacterial contamination associated with non-pathogen inactivated platelet transfusions or by major hemorrhage, which may be prevented by a higher dose of prophylactic platelet transfusions.

Finally, if dose adjustment to the patient’s body weight proves to be a better platelet transfusion approach, this may have an impact on the type of platelet concentrates needed. Further studies would be required to determine whether weight-adjusted platelet dose could best be achieved using apheresis platelets or whole blood–derived platelets using the buffy coat or platelet-rich plasma technique.

REFERENCES

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