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Lower versus Higher Hemoglobin Threshold for Transfusion in Septic Shock

Lars B. Holst, M.D., Nicolai Haase, M.D., Ph.D., Jørn Wetterslev, M.D., Ph.D., Jan Wernerman, M.D., Ph.D., Anne B. Guttormsen, M.D., Ph.D., Sari Karlsson, M.D., Ph.D., Pär I. Johansson, M.D., Ph.D., Anders Åneman, M.D., Ph.D., Marianne L. Vang, M.D., Robert Winding, M.D., Lars Nebrich, M.D., Helle L. Nibro, M.D., Ph.D., Bodil S. Rasmussen, M.D., Ph.D., Johnny R.M. Lauridsen, M.D., Jane S. Nielsen, M.D., Anders Oldner, M.D., Ph.D., Ville Pettilä, M.D., Ph.D., Maria B. Cronhjort, M.D., Lasse H. Andersen, M.D., Ulf G. Pedersen M.D., Nanna Reiter, M.D., Jørgen Wiis, M.D., Jonathan O. White, M.D., Lene Russell, M.D., Klaus J. Thornberg, M.D., Peter B. Hjortrup, M.D., Rasmus G. Müller, M.D., Morten H. Møller, M.D., Ph.D., Morten Steensen, M.D., Inga Tjäder, M.D., Ph.D., Kristina Kilsand, R.N., Suzanne Odeberg-Wernerman, M.D., Ph.D., Brit Sjøbø, R.N., Helle Bundgaard, M.D., Ph.D., Maria A. Thyø, M.D., David Lodahl, M.D., Rikke Mærkedahl, M.D., Carsten Albeck, M.D., Dorte Illum, M.D., Mary Kruse, M.D., Per Winkel, M.D., D.M.Sci., and Anders Perner, M.D., Ph.D., for the TRISS Trial Group* and the Scandinavian Critical Care Trials Group

ABSTRACT

BACKGROUND

Blood transfusions are frequently given to patients with septic shock. However, the benefits and harms of different hemoglobin thresholds for transfusion have not been established.

METHODS

In this multicenter, parallel-group trial, we randomly assigned patients in the intensive care unit (ICU) who had septic shock and a hemoglobin concentration of 9 g per deciliter or less to receive 1 unit of leukoreduced red cells when the hemoglobin level was 7 g per deciliter or less (lower threshold) or when the level was 9 g per deciliter or less (higher threshold) during the ICU stay. The primary outcome measure was death by 90 days after randomization.

RESULTS

We analyzed data from 998 of 1005 patients (99.3%) who underwent randomization. The two intervention groups had similar baseline characteristics. In the ICU, the lower-threshold group received a median of 1 unit of blood (interquartile range, 0 to 3) and the higher-threshold group received a median of 4 units (interquartile range, 2 to 7). At 90 days after randomization, 216 of 502 patients (43.0%) assigned to the lower-threshold group, as compared with 223 of 496 (45.0%) assigned to the higher-threshold group, had died (relative risk, 0.94; 95% confidence interval, 0.78 to 1.09; P=0.44). The results were similar in analyses adjusted for risk factors at baseline and in analyses of the per-protocol populations. The numbers of patients who had ischemic events, who had severe adverse reactions, and who required life support were similar in the two intervention groups.

CONCLUSIONS

Among patients with septic shock, mortality at 90 days and rates of ischemic events and use of life support were similar among those assigned to blood transfusion at a higher hemoglobin threshold and those assigned to blood transfusion at a lower threshold; the latter group received fewer transfusions. (Funded by the Danish Strategic Research Council and others; TRISS ClinicalTrials.gov number, NCT01485315.)

From the Department of Intensive Care (L.B.H., N.H., L.H.A., U.G.P., N.R., J. Wiis, J.O.W., L.R., K.J.T., P.B.H., R.G.M., M.H.M., M.S., A.P.), Copenhagen Trial Unit, Center for Clinical Intervention Research (J. Wetterslev, P.W.), and Section for Transfusion Medicine (P.I.J.), Rigshospitalet and University of Copenhagen, Copenhagen, Randers Hospital, Randers (M.L.V., H.B., M.A.T.), Herning Hospital, Herning (R.W., D.L., R.M.), Hvidovre Hospital, Hvidovre (L.N., C.A.), Aarhus University Hospital, Aarhus (H.L.N., D.I.), Aalborg University Hospital, Aalborg (B.S.R.), Holbæk Hospital, Holbæk (J.R.M.L.), Kolding Hospital, Kolding (J.S.N.), and Hjørring Hospital, Hjørring (M.K.) — all in Denmark; Karolinska University Hospital, Huddinge, Stockholm (J. Wernerman, I.T., K.K., S.O.-W.), Karolinska University Hospital, Solna (A.O.), and Södersjukhuset, Stockholm (M.B.C.) — all in Sweden; Haukeland University Hospital and University of Bergen, Bergen, Norway (A.B.G., B.S.); Tampere University Hospital, Tampere (S.K.), and Helsinki University Hospital and University of Helsinki, Helsinki (V.P.) — all in Finland; and Liverpool Hospital, Sydney (A.Å.). Address reprint requests to Dr. Perner at the Department of Intensive Care, Rigshospitalet, Blegdamsvej 9, DK-2100 Copenhagen, Denmark, or at anders.perner@regionh.dk.

*Members of the Transfusion Requirements in Septic Shock (TRISS) Trial Group are listed in the Supplementary Appendix, available at NEJM.org.

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