Department of Transfusion Medicine

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General Summary

1. The incidence of transfusion-associated adverse events in clinical departments was reported by Dr. Fujii (Yamaguchi University). The data were obtained from 17 university hospitals, including our own facility. The report showed that 4.79% of pediatric inpatients who were transfused with allogeneic blood suffered adverse events. The next most frequent (3.84%) was in hematology wards. He speculated that the higher rates in the two wards were associated with the amount of platelets used.
2. Various adverse events, including nausea and fever, occur in patients who undergo hematopoietic stem cell transplantation (HSCT). It is speculated that these events are probably due to the simultaneous transfusion of anticoagulant and cryoprotectant (dimethyl sulfoxide). However, as the details of events or causes are obscure, standard measures for preventing events associated with HSCT have not been proposed. In 2015, Dr. Ohto (Fukushima Medical University) formed a study group consisting of 20 investigators who began gathering detailed information on HSCT. As of August 31, 2016, data from 1,132 HSCT patients were collected, including 50 patients from our hospital. The interim results indicate that adverse events overall occurred most frequently in patients undergoing allogeneic bone marrow transplantation (BMT). In peripheral blood stem cell transplantation (PBSCT), the most frequent events observed were a change in blood pressure, nausea or a drop of blood oxygen saturation (SpO_2). Information from detailed analysis of these data will suggest ways in which we can improve the safety of HSCT.
3. At the annual meeting of the Japan Society of Transfusion Medicine and Cell Therapy in 2016, we stressed the importance of participation of medical technologists in preoperative conferences. Predicting problems or outlining treatment principles for a patient beforehand is important for the proper preparation of blood products, a change that could contribute to the safety of the surgery.

Research Activities

1. A Health and Labor Science Research Grant supported a 3-year study (2013-2015) that established a diagnostic algorithm to assist in distinguishing between transfusion-associated acute lung injury (TRALI) and transfusion-associated circulatory overload (TACO). Unfortunately, this guideline has not gained worldwide acceptance. To enhance both the utility of the guideline and the differential diagnosis of TRALI and TACO, we have started to collect data from patients with dyspnea associated with blood transfusion.
2. Apheresis techniques using a cell separator are well established and commonly used for the collection of mononuclear cells (MNCs) for the treatment of patients with hematological disease. Recently, the technique has been used to collect a patient's MNCs for dendritic cell immunotherapy. In our hospital, this method was introduced for the treatment

of glioblastoma. Based on our experience with 31 apheresis patients, we have sometimes noted adverse events such as numbness due to hypocalcemia during the procedure. Difficulties in communicating with a patient with a central nervous system disorder is likely a contributing cause. To perform apheresis safely, we are now developing an improved protocol for these patients.

3. A new multicenter collaborative study is now under consideration for the purpose of studying children's alloimmunity against red blood cell antigens. In Japan, little data are available on the production of alloantibodies in children. Revealing the characteristics of alloantibodies (such as antigen affinity) and their clinical significance will improve the safety of blood transfusion in children.

4. We are planning to introduce cryoprecipitates made from allogeneic fresh frozen plasma, or autologous fibrin glue for the treatment of surgical bleeding. Before that, matters of concern such as significance and the cost-effectiveness were discussed.

Publications

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Ohara Y[1], Ohto H[1], Tasaki T, Sano H[1], Mochizuki K[1], Akaihata M[1], Kobayashi S[1], Waragai T[1], Ito M[1], Hosoya M[1], Nollet KE[1], Ikeda K[1], Ogawa C[2], Kanno T[3], Shikama Y[1], Kikuta A[1] ([1]Fukushima Med Univ, [2]National Cancer Center, [3]Fukushima Red Cross Blood Center). Comprehensive technical and patient-care optimization in the management of pediatric apheresis for peripheral blood stem cell harvesting. *Transfus Apher Sci.* 2016; **55:** 338–43.