Oklahoma Blood Institute

TRANSFUSION TRIBUNE

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Questions about pre-medication with acetaminophen and/or diphenhydramine as an attempt to prevent the two most common types of transfusion reactions, i.e., febrile non-hemolytic (FNHTR) and allergic reactions, are common and everyone has their own opinion about their use in occasional or first time recipients. In chronically transfused patients that have documented multiple FNHTR, premedication is medically appropriate.

As many as 5-10% of patients receiving a blood component may experience a transfusion reaction. There is a psychological impact when a patient experiences a transfusion reaction as many times there is fear and uneasiness associated with transfusion, so it is understandable that doctors are trying to protect their patients.

FNHTRs are defined as occurring within 2-3 hours of transfusion and the patient has an increase in temperature $\geq$ 1° that cannot be explained by the patient's underlying condition. This fever is usually accompanied by chills, rigors, and changes in BP. Of course, other underlying causes for the symptoms need to be excluded. The etiology for FNHTRs is thought to be due to a patient having antibodies that are directed against transfused platelets and/or white cells. This interaction stimulates cytokine (tumor necrosis factor alpha, Interleukins 1 and 6) release, which causes an increase in temperature. Another avenue for this type of reaction is the passive infusion of cytokines that have been released by leukocytes in stored blood components as older blood components have slightly higher rates of FNHTR. Prestorage leukoreduced blood components are associated with decreased incidence of FNHTRs.

Allergic reactions are caused by transfused plasma proteins (allergens) that interact with preformed IgE antibodies. Allergic transfusion reactions are like most other allergic reactions and the severity of symptoms is varied. Clinical presentation can include urticaria, pruritus, and wheezing. More severe respiratory involvement can also be seen. Its most severe form is anaphylaxis. Leukoreduction does not affect this type of reaction because the recipient's antibodies are against the plasma proteins in the blood component. A patient with a food allergy can have an allergic reaction due to something the donor ate.

Is premedication a good idea? The answer to this question depends on who you talk to as many physicians are divided on this issue. Some argue that premedication may mask or delay symptoms , therefore delaying intervention. A recent study concluded that premedication did not impair the ability to diagnose more severe types of transfusion complications[1]. The same study's authors felt that premedication offered significant advantages to patients as some patients' anxiety about transfusion after a FNHTR is so high that they are reluctant to have further transfusions[2].

Acetaminophen use is not without risks due to its hepatotoxicity. Hospitalized patients many times have hepatic and metabolic abnormalities that could compound the situation[2]. Could repeated dosing in pediatric patients reach the toxicity threshold? Diphenhydramine does not have the same risks but its use still needs to be examined. There are significant costs associated and these too must be considered.

Only one randomized double-blind, placebo-controlled clinical trial has been done to examine the efficacy of premedication. The results of this study, which examined transfusion of prestorage leukoreduced platelets, did not show a significant decrease in the incidence of FNHTR[3]. Other studies have shown a significant decrease in the incidence of FNHTR. Deciding if the benefits outweigh the risks must be decided by the ordering physician.

References

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