

## CORRESPONDENCE

To the Editor:

A fine review of blood transfusion reactions appeared in the March 1949 volume of ANESTHESIOLOGY. I would like to call attention to two statements, however, concerning which there is a difference of opinion from that cited by the author.

It is stated on page 191, "Alkalinization by the intravenous administration of 5 per cent solution of sodium bicarbonate may be of benefit." It should be emphasized that the time relationship of the alkalinization to the hemolytic reaction is of utmost importance; in fact, some authors (1, 2) believe that to be truly beneficial, the alkalinization should be accomplished before the transfusion is given. Fortunately, hemolytic reactions are so rare that such a routine is hardly practical. It is perfectly true that if the urine is kept at a pH of 7.5 to 8, the hemoglobin stays in solution, but if an acid pH of 4.6 to 5.4 occurs, the hemoglobin is precipitated. However, probably the major portion of the hemoglobin is precipitated during the height of the transfusion reaction and therefore, to be of any benefit, the alkalinization should be started as soon as possible after the hemolytic reaction is recognized. It should not be maintained beyond the period when hemoglobinuria is present, and if it is maintained for any length of time, the patient should be carefully watched for symptoms of alkalosis, such as headache, vomiting, and muscular cramps.

Of much more serious import is the following statement on the same page. This reads, "Fluids should be given orally and intravenously with the aim of obtaining a daily intake of 3000-4000 cc. a day." If such a regimen is followed, I believe many more patients will be drowned than saved. If a patient has received over 350 to 400 cc. of incompatible blood, it is exceedingly likely that anuria or oliguria will result. In such an event, blood, plasma and fluids are used freely to combat shock. Once this is under control, a regimen of restricted fluid intake should be instituted.

This is carefully calculated to replace only the estimated fluid lost. An excellent review has recently appeared on this subject by Strauss (3). He recommended that the insensible water loss be replaced by approximately 750 cc. of fluid and this should be given in the form of glucose 15 per cent in water. This amount of glucose is given since it has been shown that it will prevent ketosis and halve protein catabolism. Higher concentrations are prone to sclerose the veins. If any urine is being passed, it can be replaced cubic centimeter for cubic centimeter by physiologic saline solution. If in addition, the patient is losing any intestinal contents, particularly gastric contents, this volume can be replaced by an equal number of cubic centimeters of physiologic saline solution. Very few of these patients will tolerate fluids by mouth, and therefore the fluid requirements should be given parenterally. Two excellent brief reviews of transfusion reactions have appeared by Nicholson in the last few years with additional suggestions for therapy (4, 5).

## REFERENCES

1. DeGowin; Hardin, and Alsever: Blood Transfusion, Philadelphia and London, W. B. Saunders Co., 1948.
2. DeGowin, E. L.; Osterhagen, H. F., and Andersch, M.: Renal Insufficiency from Blood Transfusion. I. Relation to Urinary Acidity, Arch. Int. Med., 59: 432-444 (Mar.) 1937.
3. Strauss, M. B.: Acute Renal Insufficiency Due to Lower-nephron Nephrosis, New England J. Med., 239: 693-700 (Nov. 4) 1948.
4. Nicholson, M. J.: Hemolytic Transfusion Reactions, The Lahey Clinic Bulletin 5: 101-113 (April) 1947.
5. Nicholson, M. J.: Hemolytic Transfusion Reactions, Anesthesiology 9: 345-357 (July) 1948.

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