

Blood Transfusion Reactions

Role of Nursing Staff

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WITH the advance in the management of various medical problems, either surgically or medically, the transfusion of blood has acquired a greater importance in our country and the world as a whole.

According to various surveys conducted, two per cent of all blood transfusions are accompanied by unfavourable reactions. Recently, we have observed haemolytic jaundice in many patients after blood transfusions in post-operative period. In two patients, it proved to be of fatal outcome in the surgical ward. This has prompted to study the various blood transfusion reactions in detail and give a comprehensive account of each.

The main complications from blood transfusions are: A. Haemolytic reaction. B. Allergic reactions. C. Bacterial reactions. D. Febrile reactions. E. Circulatory overload. F. Embolism. G. Transfusion of infectious agents, hepatitis, Malaria and syphilis.

A. Haemolytic Transfusion Reaction: It is one of the most severe complications of blood transfusion therapy, cause being donor-recipient ABO incompatibility. The cause may also be Rh incompatibility but it is not so severe. Factors which may contribute for this are: 1. Improper storage of blood. 2. Faulty blood transfusion procedures.

When a haemolytic reaction occurs, the agglutinated cells, after the reaction of antigen and antibodies in recipient plasma and donor cells, block the capillaries, thus, resulting in obstruction to blood flow to the vital organs. It may ultimately lead to renal failure.

Prevention

1. Evaluation of the potential donor should be done properly. He should be free of colds, allergies, hepatitis and syphilis. 2. There should be proper check on the patient and the blood product. 3. There should be a double check of all the blood products with another nurse or health personnel. 4. The intravenous tubing must be flushed with isotonic solution before and after the blood is administered. 5. After starting blood transfusion, remain there with the patient for 15 mts. The severe reactions due to blood transfusion tend to begin soon after initiation of blood transfusion. 6. The infusion should be started at

a slow rate to begin with. 7. The patient should be encouraged to call in case even unusual feelings or symptoms occur.

Signs and Symptoms

1. The onset will be immediate. 2. Patient will have facial flushing. 3. Will report burning sensation along the vein. 4. Patient will have fever with rigours and chills. Temperature may be 105 degree or more. 5. Rapid and laboured respiration will be complained of by the patient. 6. Patient will complain of chest pain. 7. Low back pain. Headache may also ensue. 9. Ultimately the patient will go in shock.

Intervention by a Staff Nurse: The transfusion should be immediately stopped. 2. Recheck blood slip with unit of blood and patient to determine if there is any error made. 3. Inform the doctor on duty. 4. Treat shock if present by giving nasal oxygen, fluids and epinephrine as ordered by the doctor. 5. Obtain two blood samples from a vein which is at a distance from the site of infusion. One sample is sent to the blood bank along with the bottle of the blood transfused and other may be centrifuged (Pink plasma indicates haemolysis). 6. Obtain first voided urine to test for haemoglobinuria. If it is present—the specimen may be red or black. 7. When renal involvement is suspected, then prompt treatment with mannitol is initiated so that diuresis is there to avoid renal tubular damage. 8. The fluid balance should be monitored.

B. Allergic Reactions: Allergic reactions are thought to be related to the presence of substances that are capable of interacting with antibodies present in the donor or recipient blood plasma.

Prevention

1. Health history is important to be asked before the blood is transfused. It is important to elicit information about any previous transfusions and more specifically about any allergic reaction to transfused blood. 2. Administer antihistamine, e.g., Inj. Avail 15-20 minutes before starting the infusion.

Signs and Symptoms: 1. Dyspnoea. 2. Urticaria. 3. Facial and/or glottal edema. 4. Asthma. 5. Pulmonary edema. 6. Anaphylaxis.

Nursing Intervention: 1. Stop transfusion immediately. 2. Inform the doctor on duty. 3. Treat the life threatening reactions (edema and anaphylaxis). 4. Administer antihistaminics parentally. 5. Administer corticosteroids parentally.

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C. Febrile Reactions: These reactions occur more frequently when equipment is reused, e.g., glass collection bottles, tubings, etc. The toxic substances in blood tubings and bacterial proteins are among the offending agents. Now with the invention of disposable equipment, this possibility is rare. However, febrile reactions do occur. The explanation for this seems to be the presence of antibodies directed against leucocytes. Another explanation in developing countries may be ill equipped hospitals and ignorant paramedical staff.

Prevention: 1. The patient should be informed during transfusion about this. 2. Administer antipyretics to persons who are known to have this reaction. 3. Transfusion with frozen washed packed cells may prevent this reaction. 4. See that the disposable, properly sterilised equipment is being used for transfusion.

Signs and Symptoms: Febrile reactions are characterized by: 1. Chills and fever that occurs an hour or more after the transfusion. 2. Headache, tachycardia and general discomfort may be present. 3. These symptoms may persist for 8-10 hours.

Nursing Intervention: 1. Discontinue the infusion of blood and notify the physician immediately. 2. The blood should be sent back to laboratory for re-examination for type and cross match as well as culture and sensitivity. 3. Treat the febrile reaction manifestations symptomatically.

D. Bacterial Reactions: These are caused by the transfusion of contaminated blood products and may prove fatal if not treated at once. The organisms which are commonly responsible for such type of reactions are: *Pseudomonas*, *Coliform*, *Achromobacteria*.

These bacteria liberate endotoxins. These reactions are very rare otherwise.

Prevention: 1. Aseptic collection technique should be used. 2. Change transfusion equipment frequently. 3. Do not keep the blood at room temperature unnecessarily. 4. Do not use blood that has been heated to above room temperature. 5. Do not prewarm infusions. 6. See for any haemolysis in the blood to be transfused.

Sign and Symptoms: 1. There will be fever. 2. Hypertension—which is very severe. 3. Pain in abdomen and peripheral parts of body. 4. Dry, flushed skin. 5. Vomiting. Bloody diarrhoea may be there.

Intervention by Staff Nurse: 1. Stop transfusion immediately and inform the doctor concerned if available. 2. Start broad spectrum antibiotics as directed immediately by the most rapid mode of administration. 3. Treat the bacteraemic shock. 4. Maintain the vital signs, fluid and electrolyte balance.

E. Circulatory Overload: Circulatory overload occurs when the blood or packed cells are administered too rapidly for the individual's cardiovascular system to respond to the additional volume.

Prevention: 1. The packed cells should be given to persons susceptible to circulatory over

load, e.g., infants elderly patients with cardiac or respiratory diseases. 2. There should be slow infusion with the patients in a sitting position. 3. J.V.P. and C.V.P. must be monitored.

Signs and Symptoms: 1. Tightness in chest. 2. Laboured breathing. 3. Dry cough. 4. Crepts at the base of lungs. 5. Pulmonary oedema. 6. Tachycardia.

Intervention by a Staff Nurse: 1. Stop or slow transfusion, depending on severity of symptoms. 2. Prop up the patient. 3. Vital signs are to be monitored. 4. Administer diuretics as ordered.

F. Air Embolism: The incidence of air embolism has been reduced by the use of plastic bags, but air may be introduced if the tubing is changed during the transfusion. Shock and cardiac arrest may ensue.

Prevention: 1. Avoid air into the infusion system. 2. If air is introduced, stop the infusion.

Signs and Symptoms: 1. Dyspnoea. 2. Cyanosis. 3. Shock. 4. Cardiac arrest.

Intervention of Nursing Staff: 1. Lower the head of the patient and turn the patient on left side. The air will collect in the right atrium where it can be gradually released to the lungs. 2. Treat shock. 3. Treat cardiac arrest if it occurs.

Follow-up of the Cases

1. The nurse should advise the patient who has experienced a transfusion reaction to relate this information to other nurses and physicians. 2. Measures to maintain a positive state of health should be taught to the patient who has a chronic disorder which requires periodic transfusion. 3. The patient should be advised to keep a neutral or written record of this and any other transfusion reactions. 4. It is also important to teach patients their blood groups and Rh types so that they too can be observant and knowledgeable during any future transfusions.

Vitamin A in Nutrition

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body. An adult requires 5000 I.U. per day. In early childhood the requirement is about 1500 to 2000 I.U. and it increases with age and reaches maximum during adolescence—a period of active and rapid growth when requirement reaches to 6000 to 7000 I.U. daily. During pregnancy and lactation the body demands are higher, therefore, 6000 I.U. for a pregnant female and 8000 I.U. for a lactating mother is recommended.

Toxicity

If Vitamin A is consumed in larger quantity for a long period it is equally harmful to health. Once the liver and tissues get saturated and overloaded, the excess of Vitamin A in the body produces toxic symptoms such as loss of appetite, drying of skin, falling of hair, irregular bone growth, pains in bones and joints. Thus if Vitamin A deficiency is harmful excessive intake is more dangerous.

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