Collection of blood report

Health & Medicine, Disease

Introduction

In any blood bank laboratory, definite tests must be done on all donated blood. This incorporates typing to verify the donor's ABO blood grouping and Rhesus factors in addition to several screens to guarantee the safety of the blood. Screening is usually conducted for unanticipated red blood cell antibodies that could cause severe reactions in the recipient and bacterial contamination in components of platelets as well as present and precedent transmissible infections. Each unit of donated blood is usually tested for Hepatitis C, HIV, Human T-Lymph tropic Virus, Syphilis, West Nile Virus and Malaria. But before any test is done it is better to look at how blood is collected, transported, then tested and stored. This paper seeks to give all the procedures involved.

Once a suitable donor is identified, a tourniquet is applied on the upper arm just above the elbow. This constricts the veins making them visible. The skin area around the vein is then cleaned with a cotton wool soaked in 70% ethanol prior to wiping through a dry clean swab of cotton wool. A venepuncture is then made with the needle directed upwards in the line of the vein. When the blood begins to flow, the pressure is reduced as the donor squeezes slowly a small object. As blood enters the pack, it gently mixes with the anticoagulant within the blood bag. After the required amount of blood is collected, the pressure is reduced to zero and the needle is removed from the patient in its place replaced by a cotton swab under a certain pressure to reduce bleeding. The donor is then given fluids to replace

the one lost by the body through the donation and the crackers to provide energy.

Some of the blood collected from the donor is put into a plain tube (no anticoagulant) for laboratory testing. The rest is refrigerated but after the blood is allowed time to cool and for natural bactericidal activity of white cells to occur, that is for about 1–2 h.

Major tests

The blood is then transported to the laboratory for Screening for infectious agents and unexpected antibodies that could be dangerous especially during a blood transfusion. All donated blood require screening for infectious diseases that are prevalent in the community and carry a significant risk of causing disease in recipients of that blood. Important infectious agents include:

Human immunodeficiency virus

The risk of developing HIV disease/AIDS after being transfused with HIV infected blood is high. All donor blood must be screened for the antibodies to HIV-1 and HIV-2 using sensitive tests mainly the rapid biochemical and molecular tests currently present. Transmission of HIV in donor blood can also be minimized by using low risk voluntary unpaid donors and giving donors the opportunity to self-exclude when they suspect infection with HIV. This is because even when an HIV antibody screening test is negative, blood may still contain HIV(Lewis , 2001). This usually occurs when blood is collected during the ‘ window period’ that is, Soon after a donor becomes

infected with HIV when antibody to the virus is not yet detectable in the serum.

Hepatitis B virus (HBV)

In many countries it is thought that up to 6% or more of adults are carriers of HBV (Lewis, 2001). Those at the greatest risk of developing viral hepatitis from HBV infected blood and blood products are young children and the immune-suppressed patients. Tests to screen donor blood for HBV are based on the detection of hepatitis B surface antigen (HBsAg).

Hepatitis C virus (HCV)

This can cause viral hepatitis in recipients but it is not as infectious as HBV. Following an acute infection, 70–80% of individuals become chronic HCV carriers with the risk of developing liver cirrhosis and liver cancer later in life. Where the prevalence of HCV is known to be high, donor blood should be screened for antibody to HCV when this can be afforded.

Syphilis

Transfusing blood containing syphilis causing bacteria can cause syphilis in recipients although the risk of transmitting the disease is low, particularly when donated blood is stored at 2–8 C for 48–72 h. However it is imperative to screen for this agent.

Malaria

Transfusing blood containing malaria parasites can cause malaria in recipients devoid of effective immunity, especially, young children and

pregnant women. So it is important to screen blood for these parasites. A thick or thin smear can be used to identify the parasites. O

Human T cell lymphotropic virus (HTLV) 1and 2:

This virus can cause HTLV disease, adult T-cell leukaemia/lymphoma (ATLL), or tropical spastic paraparesis (TSP). It has a high prevalence in parts of Central and South America, the Caribbean, and parts of sub-Saharan Africa (Kataha, 2002). It is estimated that about 60% of recipients receiving HTLV infected blood actually seroconvert. The risk of developing disease later in life is thought to be low. HTLV antibody screening tests are expensive.

Apart from screening, The ABO and Rhesus blood grouping is also done as part of blood bank testing. Blood donors and patients must be correctly ABO grouped because transfusing ABO incompatible blood may result in the death of a patient. Rhesus grouping is also performed routinely in the blood bank laboratory. The safe transfusion of blood to patients depends on the correct ABO grouping of donors and recipients. The decision to Rhesus group will depend on the frequency of the Rhesus D antigen in the population, national policy, and availability of reagents. ABO and Rhesus grouping can be performed in tubes, on tiles, slides or in micro plates (microfiltration plates) using liquid antisera. In blood transfusion centres, blood donors are grouped economically using a spun microplate technique (Mvere, 2002).

Blood grouping gelantisera card systems are also commercially available for ABO and Rh grouping. ABO grouping consists of: Cell grouping in which the red cells are tested for antigens A and B using anti-A and anti-B sera that are commercially available. Drops of blood are placed on a slide and to each

drop; a drop of respective antisera is added. Coagulation denotes a positive result. In addition, Serum grouping (reverse grouping) can also be used In ABO grouping. Here it is the serum hat is tested for anti-A and anti-B antibodies using known A and B red cells. Performing both cell and serum grouping greatly reduces the risk of errors in ABO grouping. On the other hands, to perform Rhesus grouping the following are required: Blood sample, Anti-D serum and Controls. The same blood sample used for ABO grouping should also be used for Rhesus grouping.

Storage

Once the testing is comprehensively done, those units of blood that are without infection are made accessible for transfusion when required. Those with infections are therefore discarded in accordance with the rules and regulations of disposal of hazardous wastes. The donor is also notified in addition to being prohibited from future blood donation. Appropriate storage of whole blood and blood components is equally necessary.

Conclusion

Tests done in the blood bank laboratories are crucial in determination of life. At all levels of health care, health personnel have taken numerous opportunities of educating the public about the need for blood and motivating people to become regular voluntary donors to help others. Transfusion of bacterially contaminated blood can cause fever, shock, collapse and death. Blood is commonly contaminated at the time of collection partly because the venepuncture site could not be cleansed adequately or when a non-sterile blood collection set or blood collecting bag

is used. Blood must always be examined for signs of contamination at the time of use.

References

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