NHS
Blood and Transplant

NHSBT Board Meeting

A Patient Story: Focus on blood donor with acute hepatitis B virus infection

September 2021

This is a story of a young woman in her early 30's. She gave her first successful blood donation in March 2019 but was diagnosed with acute hepatitis B virus (HBV) infection on her subsequent donation in January 2020. This story demonstrates our involvement with her case from providing support and advice to her initially when giving her this unexpected diagnosis, following her up over one-year period and now being able to invite her back as a blood donor. We explain the complexity of this work, involving the NHSBT Microbiology Services Team, PHE, the local Health Protection Team, GP and Liver Specialist.

Hepatitis B virus infection

Acute HBV infection can be asymptomatic, but if symptoms develop, they include general feeling of being unwell, a loss of appetite, aching muscles, nausea and vomiting. Those who develop of signs of hepatitis usually have abdominal pain, jaundice and corresponding changes in the colour of their urine and stools. We see a small number of blood donors with acute HBV infection every year, and like this donor, they are usually asymptomatic at the time of their diagnosis. However, some of them may develop symptoms at later stage and hence they are monitored very closely.

Most adults with acute HBV infection recover completely; chronic infection occurs in 10% of adults only. In contrast, chronic HBV infection occurs up to 50% of children and 90% of newborns who acquire infection. HBV is a major cause of chronic liver disease and cancer, and also a continued risk in transfusion medicine. For these reasons, individuals with chronic HBV infection cannot donate blood but individuals with recovered acute HBV infection can be reinstated as donors. This requires that they develop a strong natural antibody response (surface antibody level has to be over 100mIU/ml), coinciding with the loss of surface antigen and viral DNA in blood, within one year from diagnosis. For these reasons, we follow our blood donors with acute HBV infection very closely for one year. This young woman was lucky; she mounted a sufficient immunoresponse within 12 months from diagnosis and was hence allowed to return to the blood donor panel earlier this year. However, it is important to note that we cannot cure HBV infection as HBV integrates into human DNA in the liver. It is therefore possible that these donors might reactive their HBV later on in their life as a result of weakened immunecontrol over their HBV infection; this is called occult HBV infection (OBI). It was previously thought to be very unlikely that this form of the disease could be transmitted through transfusion as the level of the virus in blood is so low. However, a total of 5 HBV transmissions have been linked to donors with OBI in the UK. We referred this to SaBTO after completion of investigations of two recent cases in 2019, one of which led to a death of patient, and SaBTO are currently making recommendations for blood safety on OBI as discussed in the Clinical Governance report to this Board.

HBV is a major problem worldwide. Over 350 million people are persistently infected with HBV but only 10% are aware of their HBV infection. In high endemicity areas such as Sub-Saharan Africa, South East Asia, China and the Amazon Basin, up to 50% of the population have evidence of past HBV infection and every 5th of them has also evidence of chronic HBV infection. Although HBV infection is rare in the UK, it is one of the most frequently detected infections in blood donors in England. Over the last 10 years, from 655 blood donors with HBV infection over 90% were classed as chronic infections, and most of them in donors born in

HBV endemic countries. Our case was a typical case of acute HBV, among the other 33 acute HBV infections we have identified since 2009.

HBV is present and transmitted in blood; it can also be transmitted through intravenous drug use, through sexual intercourse and from mother to child during childbirth. In endemic countries, infections are usually transmitted between close family members, siblings and friends unknowingly. In these circumstances there will be frequent contact with blood and saliva. The incubation period of HBV infection is usually about 2 to 3 months. Our case had acquired her infection after her previous donation in March 2019 (we always re-check that donation to exclude early infection), most likely from her most previous sexual partner. She had not been vaccinated against HBV, and it remained uncertain if she was aware of transmission routes and potential increased risk of HBV infection associated with individuals born in HBV endemic countries. Donors are always asked whether their partner has HBV infection, and there are deferrals in place for both having sex with or living with a known HBV positive partner but no other specific deferrals around country of birth.

It is important for our epidemiological surveillance to record the risk factors for infection as this information will be used to inform our future policies and can also support public health actions.

Acute HBV is a notifiable infection; we will inform the local public health team as soon as we receive these results. They will follow up sexual and other contacts for possible post-exposure prophylaxis (HBIG and/or vaccination). In this case, she was sharing a house with her girlfriend who was offered HBV vaccination. We also informed her GP (with her permission) and recommended a referral to liver specialist. They monitored her very closely to ensure she remained well; some of our cases have required hospitals admission and early HBV treatment. She will carry this virus lifelong; if she ever becomes immunocompromised, that might trigger the reactivation of virus and hence close monitoring or even prophylactic treatment is recommended in case of immunosuppression. However, she is not currently infectious.

In the UK, HBV vaccination has been recommended for those at increased risk of HBV since the safe and effective vaccine became available in late 1980s. In addition, HBV vaccine has been available for all babies born in the UK since late 2017.

Follow-up of over 600 infected blood donors annually is true multidisciplinary working within and beyond NHSBT and is led by the Microbiology Clinical team. It is also important to note that each of these diagnoses can have significant consequences to the donor reminding them of significant (and often unwelcome) events in their past and can have a big impact on their current and future relationships. We always do our best to support donors when learning this difficult and potentially life-changing news.

Author: Heli Harvala, Consultant Medical Virologist and Principal Investigator, Microbiology Services, NHSBT, Colindale

Responsible Director: Gail Miflin

Date: September 2021