4.3.2 Chagas disease

Agent

Chagas disease is caused by the parasite *Trypanosoma cruzi*. Chagas disease is transmitted primarily when the parasite contained in droppings of an infected bug enters the bloodstream through the bite of the primary host, a reduvid bug. However, it can also be transmitted from human to human through the parenteral route by the transfusion of blood or transplantation of tissues from an infected individual.

Chagas disease is geographically restricted and endemic only in Central and South America and parts of Mexico. It is estimated that up to 30% of infected adults die from the chronic effects of Chagas disease in some areas. Up to 20% of infected individuals remain asymptomatic for long periods.

Effective vector control is an important factor in the reduction of the risk of Chagas disease. This has the effect of reducing the disease burden in the population and so reducing the incidence of infections in blood donors. Vector control has proved to be effective in a number of countries in Central and South America, in some resulting in the eradication of all cases of insect-borne infection. Some Latin American countries have eliminated incident cases of primary infection, although a reservoir of infected individuals still remains in the population.

Transmissibility

Although primarily transmitted by an insect vector, Chagas disease is readily transmitted by the transfusion of blood donated by asymptomatic parasitaemic donors. The parasite is released into the bloodstream during its lifecycle and will therefore be present in donated blood from infected individuals. The parasites are stable in plasma and whole blood for at least 30 days when stored at +4°C and for extended periods in frozen state.

Chagas disease is a major concern in endemic countries. It is also of concern to blood transfusion services in some non-endemic countries to which significant numbers of blood donors migrate from regions where Chagas disease is still endemic or where donors travel regularly to endemic areas. Sporadic primary infections have been reported in the southernmost states of the USA. Although not a global problem, many countries have to deal with blood donors who have travelled in Central and South America and therefore need to develop strategies to address this problem.

Screening

Screening for Chagas disease involves the detection of anti-*T. cruzi* in the donated blood. There are a number of sensitive and reliable assays available and the serology of *T. cruzi* is well understood (*40*). In addition, there are antigen detection assays, nucleic acid amplification technology and even xenodiagnosis, although this is clearly not suitable for blood screening.

RECOMMENDATIONS

Endemic countries

To prevent the transmission of Chagas disease through the route of transfusion in endemic countries:

1 Screening should be performed using a highly sensitive **Chagas antibody enzyme immunoassay**.

Non-endemic countries

To prevent the transmission of Chagas disease through the route of transfusion in non-endemic countries:

1 All donors with a history of Chagas disease should be permanently deferred.

2 If screening tests for Chagas disease are not available, all donors with an identified risk of Chagas disease should be identified and permanently deferred.

3 If screening tests for Chagas disease are available, all donors with an identified risk of Chagas disease should initially be deferred for six months since their last return from an endemic area. Their subsequent donations should then be screened for evidence of infection using a highly sensitive **Chagas antibody enzyme immunoassay**.

4.3.3 Human T-cell lymphotropic viruses I/II

Agent

The human T-cell lymphotropic (or leukaemia) viruses I/II (HTLV) are enveloped, single-stranded RNA retroviruses. HTLV is transmitted by the parenteral route and may be found in blood, normally in lymphocytes, and in other body fluids. It is generally not found in plasma or cell-free body fluids.

HTLV is endemic in parts of the world but, in some regions, its incidence and prevalence are low or it may be totally absent. HTLV-I and HTLV-II are two very similar but distinct viruses which are generally considered together because of their similarities. The specific differences include their geographical distribution and clinical disease association. HTLV has a high prevalence in some groups of injecting drug users.

Transmissibility

While HTLV is present in the bloodstream, the levels of the virus itself are variable. In recently infected individuals, virus may be found free in the plasma. Subsequently, free virus is rarely found, the virus being present in the T-lymphocytes. The infectivity of blood and products is reduced but not removed by leucodepletion. As infection is considered to persist for life, screening for anti-HTLV identifies donations that may transmit HTLV but does not in itself indicate the timescale of an infection. However, there is evidence that the pathogenicity of transfusion-transmitted HTLV is low, except in severely immunodeficient recipients (*41–43*).

HTLV is always of concern in endemic countries as well as to blood transfusion services in a number of non-endemic countries. There is significant migration from endemic areas to non-endemic areas where migrants may then become blood donors. In addition, a low level of incident infection may be introduced into a non-endemic country through migration, and the infection may spread horizontally into the non-migrant population or vertically to the children of migrants that were conceived in the non-endemic country.

Screening

HTLV screening involves the detection of specific antibody to both HTLV-I and HTLV-II. Although there is cross-reactivity between HTLV-I and II in a similar way to HIV-1/2, it is incomplete; cross-reactivity to HTLV-I cannot be relied on to