11 Transfusion-Transmitted Infections

Definition of a Transfusion Transmitted Infection (TTI)

A report of an infection suspected to be due to transfusion was classified as a **transfusion-transmitted infection** if the following criteria were met at the end of the investigation: -

- The recipient had evidence of infection post-transfusion, and there was no evidence of infection prior to transfusion and no evidence of an alternative source of infection

  And, either

- At least one component received by the infected recipient was donated by a donor who had evidence of the same transmissible infection,

  Or

- At least one component received by the infected recipient was shown to have been contaminated with the agent of infection

Summary

Since 1995, blood centres in England, Wales and Northern Ireland have reported possible transfusion transmitted infections, of which they have been informed, to the NBS/Health Protection Agency Communicable Disease Surveillance Centre (HPA CDSC) Transfusion Transmitted Infection Surveillance scheme. A similar scheme has existed in Scotland since 1998; data from this are passed to the NBS/HPA scheme.

In 2003, 38 reports of possible transfusion transmitted infections in the UK were made to the surveillance scheme. After the investigation had been completed, 8 reports were classified as probable transfusion transmitted infections (2 HBV, 1 HIV, 1 HAV, 1 malaria and 3 bacterial contaminations) one of whom died, 24 were found not to be related to transfusion and 3 had an undetermined source. Full investigations on 2 cases are still pending. The UK's National CJD Surveillance Unit and the NBS made a report of the first possible case of transfusion transmitted vCJD, identified in 2003 following a death in a transfusion recipient. Additionally, there were 38 reports of post transfusion reactions (PTRs) in England, Wales and Northern Ireland where the packs were returned for investigation to exclude bacterial contamination, although this was not thought the likely cause of the reaction. No evidence of contamination was found in these 38 cases.

The risk of acquiring an infection through blood transfusion in the UK remains very low. The low number of reports of bacterial contaminations this year could be the result of improved donor arm cleaning and procedures to divert the first 20-30ml of each donation. However, transfusion transmitted bacterial infection remains an avoidable cause of death and major morbidity and merits increased efforts to prevent bacterial contamination of components. Continued reporting and investigation of all possible incidents of transfusion transmitted infections is essential.

Introduction

In the investigation of incidents of infection suspected to be due to transfusion, markers of infection in the implicated donation, or in subsequent samples from the donor(s) of the implicated donation(s), can confirm transfusion as the probable cause of infection, or identify the need to investigate other possible sources. The blood service must therefore be informed about implicated transfusions so that investigations can be conducted to confirm or refute the suspicion that the implicated transfusion(s) may have been infectious. This is essential to prevent further transmissions by other components of the same donation or future donations from chronically infected donors, or to reveal any systematic errors in laboratory testing, or transfusion practices.

Infectious complications following transfusion differ from non-infectious complications in several ways that may affect the ascertainment and investigation of incidents. The onset of symptoms related to a transfusion-transmitted viral infection may occur from several weeks to years after the date of the transfusion. Reports of incidents in a particular year can therefore accrue over subsequent years, and the number ascertained by the end of any period may not necessarily represent the number of infections transmitted. The reporting of incidents involving acute infections that tend to be clinically apparent and diagnosed within days after receipt of the infectious transfusion, such as bacteraemia, may be relatively complete, but incidents involving chronic viral infections may not. In addition, the occurrence of disease, or the observation of serological markers of infection in donors can lead to the ascertainment of TTIs through "lookback" - the tracing and testing of recipients exposed to components collected from donors during potentially infectious periods. Recipients may be asymptomatic at this time and only identified by this investigation.

A surveillance system to collect standardised information about infections suspected to have been transmitted by transfusion was introduced in the UK (excluding Scotland) and the Republic of Ireland as a collaboration between the transfusion services and the HPA CDSC in October 1995. A similar collation of reports of incidents investigated by Scottish blood centres has been in place in Scotland since October 1998. Data from the UK are included in this report.

Methods

Blood centres in England, Wales and Northern Ireland were asked to report possible incidents of infection due to transfusion of which they had been informed to the NBS/HPA CDSC Transfusion Transmitted Infection Surveillance, according to criteria listed in the Table 17. For each eligible incident, information about the recipient, the recipient's infection, the transfusion(s) implicated, and details of the findings of the investigation were collected using a detailed proforma. (See www.shot-uk.org for a specimen proforma).

Classification of reports

After investigations were closed, reported incidents were classified as a TTI according to the definition given at the beginning of this chapter. Incidents in which the infection in the recipient was shown not to be due to transfusion, since all donations were cleared or another source of infection was identified, were classified as not transfusion transmitted infections. Incidents were classified as undetermined if the investigation was closed without being able to conclusively confirm or refute that blood transfusion was the source of the infection. If, during the investigation, another possible source of infection was identified or the recipient was found to have a pre-existing infection, the incident was excluded.

Table 17

The inclusion and exclusion criteria for reporting eligible incidents of infection suspected to be due to transfusion to the NBS/HPA CDSC Transfusion Transmitted Infection Surveillance

Inclusion criteria:

An incident should be reported if receipt of the transfusion is confirmed, and either,

a) The infection in the recipient had been confirmed by detection of antibody, antigen, RNA/DNA or culture as appropriate and there was no evidence that the recipient was infected prior to transfusion

Or,

b) The recipient had acute clinical hepatitis of no known cause (including no evidence of acute hepatitis A virus (HAV), HBV, HCV, Epstein-Barr virus or CMV infection in post-transfusion samples to date).

Exclusion criteria:

An incident should NOT be reported if:

a) The incident involved HCV or HIV in recipients who had received transfusions in the UK prior to routine testing. [September 1991 for anti-HCV, October 1985 for anti-HIV] ±

b) The incident involved HTLV in a recipient identified through the HTLV National Lookback±±

c) The incident involved a transfusion outside UK

± The blood service is rarely able to conduct follow-up investigation of all untested donors implicated in post-transfusion HCV or HIV incidents, and these cases do not contribute to knowledge of the current infection transmission risks of blood transfusions. ±±Any post-transfusion HTLV infections identified through the HTLV National Lookback are excluded but will be collated, analysed and published elsewhere, as was done previously with HCV 'lookback'.

Data received by 31/3/2004 about incidents of suspected transfusion-transmitted infections initially reported by blood centres between 1/1/2003 and 31/12/2003 are included in this report. Data received about incidents reported during the previous seven years of the surveillance system are included in the cumulative table and figure.

Blood centres in Scotland reported all incidents to the Microbiology Reference Unit of the Scottish Blood Transfusion Service where they were investigated, and the details and conclusion of each case was then provided to the SHOT system.

Results

Between 1/1/2003 and 31/12/2003, 38 reports were made to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance: 29 from blood centres in England, Wales and Northern Ireland and 8 from Scotland (Figure 17). All 12 of the blood centres in England, Wales and Northern Ireland, and all 5 centres in Scotland made reports. An additional report of a possible transfusion transmitted vCJD was made by the UK's National CJD Surveillance Unit and the National Blood Service.

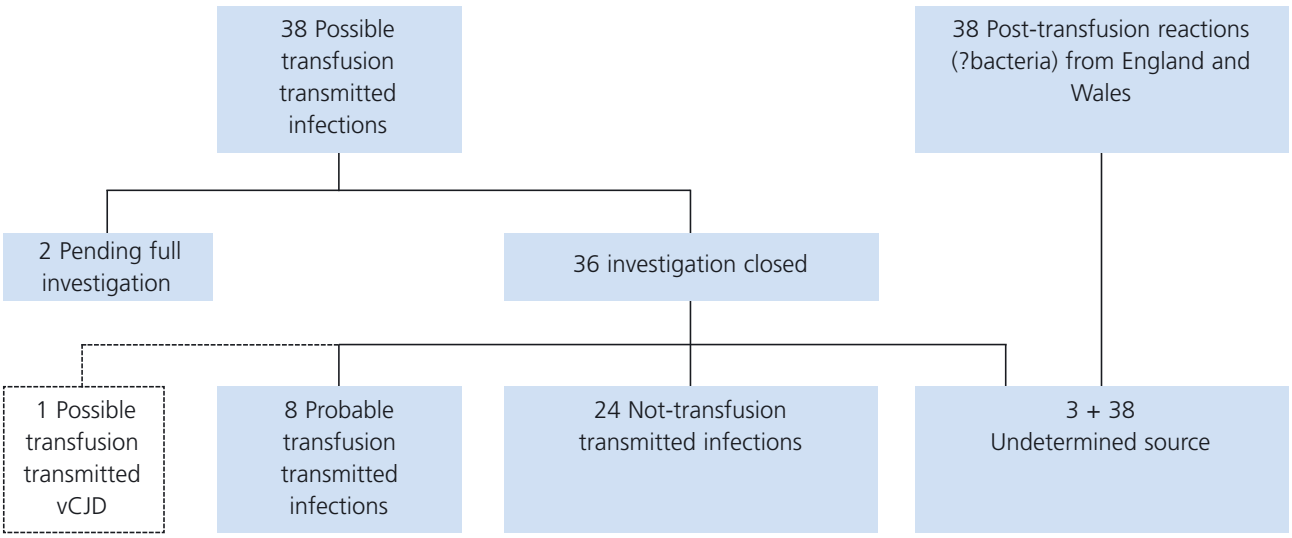
Of the 29 reports from blood centres in England, Wales and Northern Ireland, six (22%) were classified as transfusion-transmitted infections: one due to HAV, one due to HBV, one due to HIV, one due to malaria and two due to bacterial contaminations. For 20 (74%) reports (11 bacteraemia, 4 HBV infections, 3 HCV infections, 1 HIV infection, 1 CMV), investigation was complete and there was no evidence to implicate transfusion as the source of infection, these were classified as not transfusion transmitted infections. Two reports of incidents were classified as HCV infections of undetermined source due to inconclusive investigation of the donation(s) implicated as the source of infection. A further HCV infection suspected to be due to transfusion was still pending full investigation.

An additional 38 reports were made from blood centres in England, Wales and Northern Ireland of PTRs where bacterial contamination was initially included in the differential diagnosis, but had no evidence of bacterial infection in either the recipient or the implicated component that could have caused the reaction.

In Scotland, blood centres made eight reports of infection suspected to be due to transfusion during 2003. Two reports (1 HBV and 1 *Escherichia coli*) were classified as transfusion transmitted infection following complete investigations. For two HBV, two HCV and one parvovirus infection investigations were complete and there was no evidence to implicate transfusion as the source of infection. One HCV infection suspected to be due to transfusion is still under investigation. Scottish cases reported since October 1998 have been included in the numbers of post-transfusion infections and transfusion-transmitted infections shown in the tables and figures here since the 2000/01 SHOT Annual report.

Figure 17

Classification of reports made to the NBS/HPA CDSC Transfusion Transmitted Infection Surveillance from blood centres in the UK between 1/1/2003 and 31/12/2003.



Details of transfusion-transmitted infections

A. Infections for which donation testing was mandatory

Hepatitis B virus

Two transfusion transmitted HBV infections were reported during 2003.

A previously Hepatitis B surface antigen (HbsAg) negative apheresis donor was found to be positive after routine testing in February 2003. An archived sample of a donation made a month earlier was re-tested and found to be HBsAg, anti-Hepatitis B core (HBc) and HBV DNA negative. A single recipient (two year old female) of this donation was traced, tested and monitored. Six months following the transfusion of the implicated unit she was found to be HBsAg and HBV DNA positive. Sequencing information linked the infection in the donor to the recipient, thus the source of the recipient's infection was confirmed to be probably due to an HBV infectious donation from a donor in the very early acute phase of infection.

A recipient (57 year old male) developed symptoms of acute hepatitis five months after receiving 2 units of red cells during surgery in 2002. The recipient was found to be HBsAg and anti-HBc IgM positive and the archived samples of both units were tested; one was found to be HBsAg, anti-HBc (total) and HBV DNA positive, the other was negative for all markers of HBV infection. The recipient's infection was concluded to be probably due to an HBV infectious unit of red cells from a first time donor in the acute phase of infection with HBsAg at a low level that had not been detected by the HBsAg assay. The donor of the implicated unit was unaware of his infection and had donated again six months later (before investigation had commenced). By this time, the donor's infection had resolved and so the unit tested negative at the routine HBsAg test and was transfused. A single recipient of the second donation was traced and tested, but there was no evidence of transmission; the archive sample of this donation was found to be HBsAg and HBV DNA negative and anti-HBc (total) positive.

Hepatitis C virus

No transfusion transmitted HCV infections were reported during this year.

HIV

One transfusion transmitted HIV infection was detected by lookback in 2003. A previously anti-HIV negative donor was found to be positive by routine testing of a donation in 2003. The archive of the previous anti-HIV negative donation made in 2002 was retrieved for PCR testing and found to be HIV RNA positive. A single recipient (female, 45 years) was traced and tested 15 months after transfusion of the red cells from the donation following post-operative bleeding and found to be anti-HIV and HIV RNA positive. The recipient reported having had an illness consistent with HIV seroconversion three weeks after transfusion, however had no other symptoms when identified as HIV positive. The probable source of the recipient's infection was concluded to be an HIV infectious unit of red cells from a seroconverting donor. No source of the donor's infection was identified.

A further incident of predicted HIV transmission from a seroconverting donor was identified in 2003. Here, an anti-HIV negative donation (donated in October 2002) was found to be HIV RNA positive by retrospective PCR testing performed because the donor was anti-HIV positive at the time of the subsequent donation. Red cells from the seronegative unit had been transfused to a recipient (a female aged over 80 years), who had received a single unit of red cells during surgery for a fractured femur in 2002. The recipient died soon after surgery, and her HIV status was not determined.

In both of the above cases, the level of viraemia in the implicated donation was sufficient to have been detected by pooled PCR testing, although this is not currently part of routine testing in England and Wales.

HTLV

No transfusion transmitted HTLV infections were reported during this year.

B. Infections for which donation testing was not mandatory

Hepatitis A

One transfusion-transmitted HAV infection report was made in 2003. A repeat donor reported onset of jaundice 6 days after making a donation in 2000. The donor was tested, found to be anti-HAV IgM positive and made a complete recovery. The donation had been processed: platelets were included in a pool; the plasma from the infected donor was not used and the red cells discarded. The recipient of the platelet pool (32 year old female) had received a bone marrow transplant 6 weeks prior to the transfusion and was known to be anti-HAV IgG and IgM negative at that time.

Four weeks following transfusion, the recipient was found to be anti-HAV IgG positive but HAV IgM negative. The anti-HAV IgG reactivity was initially thought to be due to the high dose of Human Normal Immunoglobulin (HNIG) the recipient was given following realisation she had been exposed to HAV. A further 4 weeks later the recipient was tested and found to be anti-HAV IgM positive, and subsequently developed symptoms of hepatitis A disease, but later recovered. The probable source of the recipient's infection was concluded to be an HAV infectious unit of pooled platelets.

Malaria

One transfusion-transmitted malaria infection report was made in 2003. Low haemoglobin levels in a recipient (51 year old male) following transfusion over a period of three months for treatment of sickle cell disease prompted an investigation into the probable cause. Review of a blood film from the recipient identified a low-level *Plasmodium falciparum* parasitaemia despite a lack of travel outside the UK. The archived samples of the seven units of red cells received by the recipient were retrieved and tested for malaria antibodies and the donors were contacted for any relevant travel history. One of the seven units had been tested prior to transfusion because the donor reported relevant travel history at the time of donation, and was negative, and was also found negative on re-testing. Five of the remaining six units were negative for malaria antibodies; all except one of these donors had no relevant travel history. The seventh donation tested positive for malaria antibodies: the donor had lived in West Africa until the age of 21, although had not visited the area for seven years prior to the donation. The probable source of the recipient's infection was concluded to be a *P.falciparum* infected unit of red cells. Although malaria antibody testing would have avoided this transmission, the donor did not qualify for testing under current guidelines.

Bacterial contamination

Three transfusion-transmitted bacterial contaminations were reported between 1/1/2003 and 31/12/2003. Two recipients had major morbidity, and one died.

One recipient (42 year old male) developed rigors and hypotension following transfusion of a two-day old unit of apheresis platelets for treatment of leukaemia in Scotland in 2003. The patient was resuscitated with intra-venous fluids and given antibiotics but went on to develop a fever and symptoms of cardiac failure. The patient was transferred to intensive care for monitoring, but died 15 hours after the transfusion. *E.coli* was cultured from the recipient's blood and the implicated platelet pack. Extensive investigation failed to reveal a source for the bacterial contamination, but since the venepuncture site of the donor was not swabbed, the donor's arm could not be excluded as a possible source. The probable source of the recipient's infection was concluded to be a unit of apheresis platelets contaminated with *E.coli* of unknown source.

One recipient (60 year old female) developed fever and diarrhoea following transfusion of a single unit of 4-day-old apheresis platelets during treatment for acute myeloid leukaemia. *Staphylococcus* aureus of the identical strain was cultured from the recipient's blood, the platelet pack and the venepuncture site of the donor. The recipient recovered after antibiotic treatment and was discharged from hospital five days after the transfusion. The probable source of the recipient's infection was concluded to be a unit of platelets contaminated with *S. aureus* from the donor's arm.

One recipient (61 year old male) developed hypotension, breathlessness, fever and rigors following a transfusion of a 5-day old unit of pooled platelets. *Staphylococcus epidermidis* was cultured from the patient, the pooled unit and (although not same strain) the venepuncture site of one of the donors. The probable source of the recipient's infection was concluded to be a unit of pooled platelets contaminated with *S. epidermidis*. The most likely source of the contamination was the donor's arm despite the fact that the organism isolated was a different strain from that isolated from the patient and the platelet pack.

vCJD

The first possible case of transfusion transmitted vCJD was identified during 2003 by the UK's National CJD Surveillance Unit and the NBS.[7] The details of the case were passed to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance and have been included here. In 2003, a case of vCJD was diagnosed after death in a transfusion recipient (aged 62 years).[7] In 1996, this individual had received a unit of red cells from a donor who developed symptoms of vCJD 3 years later and died from pathologically confirmed vCJD in 2000. The implicated red cell unit was not leucodepleted and had been given to the recipient during a transfusion of 5 units of red cells while undergoing surgery. The source of the recipient's infection was concluded to possibly be a vCJD infectious unit of red cells. Due to the absence of further evidence that human prions can be transmitted by transfusion, and because (in this case) other possible sources such as dietary exposure to Bovine Spongiform Encephalopathy agent could not be excluded, the source of the recipient's infection could not be confirmed as transfusion.

Under-reporting

Each year, incidents of post-transfusion infection may be missed. However, the extent of under-reporting is unknown. Incidents ascertained by this surveillance system were diagnosed infections or reactions, suspected to be attributable to transfusion, communicated to the blood service and from there passed to the surveillance unit; failure at any one of these steps may result in under-reporting. The proportion of post-transfusion infections that are reported may vary between year as other factors such as testing performed on transfusion recipients, awareness of transfusion as a possible source of infection, reporting of information to blood centres and reporting of information from blood centres to the surveillance centre vary.

Previous year – 2001/2002

In the previous year's SHOT Annual Report, of 34 reports made to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance Post-transfusion Infection Surveillance between 01/10/2002 to 31/12/2002, five (15%) of these were subsequently classified as TTIs (see SHOT Annual Report 2001-02 for details). Two reports of investigations that were classified as pending full investigation in the 2001-02 SHOT Annual Report have been concluded not to be as a result of transfusion as all donations were cleared, and subsequently classified as not transfusion transmitted infections.

Cumulative data

The cumulative number of reports of PTI and PTR made to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance by year of transfusion since October 1995 is shown in Figure 18. The cumulative numbers of reports of TTIs made by year of transfusion reported by the end of December 2003 are shown in Table 18.

Figure 18

Reports of possible transfusion transmitted infection in UK and post-transfusion reaction in England and Wales made to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance by year of report (Scotland included from 10/98)

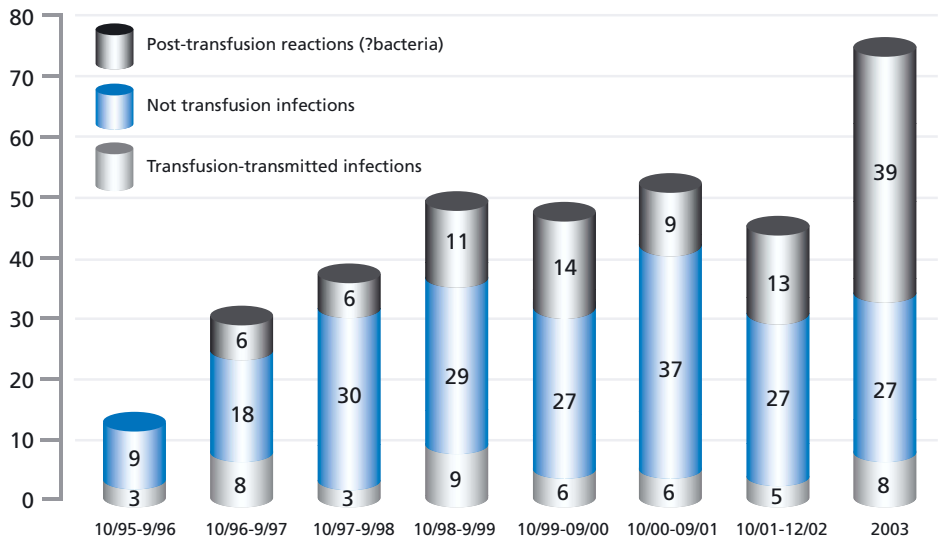


Table 18

Cumulative total of reports of transfusion-transmitted infections made to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance between 1/10/1995-31/12/2003 by date of transfusion. The number of incidents is shown with the total number of identified infected recipients in brackets.

Year of transfusion	Pre 1996	1996	1997	1998	1999	2000	2001	2002	2003	Total	Deaths
Infection											
HAV	-	1(1)	-	-	-	1 (1)	-	-		2	-
HBV	2(2) [b]	1(1)	1(1)	1(1)	2(3)	1(1)	-	1(1)	1(1)	10	-
HCV	-	1(1)	1(1)	-	-	-	-	-		2	-
HIVc	-	1(3)	-	-	-	-	-	1(1)		2	-
Bacteria	1(1)	1(1)	3(3)	4(4)[ax2]	4(4)[a]	7(7)[ax3]	5(5)	1(1)	3(3) [a]	29	7
Malaria	-	-	1(1)[a]	-	-	-	-	-	1(1)	2	1
HTLV I	2(2)	-	-	-	-	-	-	-		2	-
Possible vCJD		*1(1)*								*1*	*1*
Total	**5(5)** [b]	**6(8)**	**6(6)[a]**	**5(5)[ax2]**	**6(6)[a]**	**9(9)**	**5(5)**	**3(3)**	**5(5)**	**50**	**9**

Notes: [a] Infection was implicated in the death of a recipient.
[b] One household member who was caring for the recipient has been diagnosed with acute HBV.
[c] One additional investigation failed to confirm or refute transfusion transmission of HIV infection during the early 1990s. As the patient had received multiple transfusions, and had no other risk factors for infection, transfusion with HIV infectious blood was concluded to be the probable, although unproven, source of infection.

Cumulative data about bacterial transmissions

A summary of the species of bacteria and the type and age of the implicated components for the 29 transfusion-transmitted bacterial contaminations reported between 01/10/1995 and 31/12/2003 are shown in table 19.

Table 19
Reports of transfusion-transmitted bacterial contaminations in UK made to NBS/HPA CDSC Transfusion Transmitted Infection Surveillance between 01/10/1995 and 31/12/2003 by species and component type and age (N=29).

	Platelets Age (in days) at use							Red cells
	1	2	3	4	5	NK	**ALL**	
All species	*0*	*2*	*3*	*6*	*10*	*4*	***25***	*4*
Bacillus cereus				3[a]		1	**4**	
Coagulase negative Staphylococci					1		**1**	1 (23 days)
Enterobacter aerogenes			1[a]				**1**	
Escherichia coli		1[a]	1[a]			1	**3**	
group B Streptococcus			1	1		1	**3**	
Morganella morganii					1		**1**	
Serratia liquifaciens								1
Staphylococcus aureus					2	1[a]	**3**	
Staphylococcus epidermidis		1[a]		2	6		**9**	1 (32 days)
Yersinia entercolitica								1[a] (33 days)

[a] Infection was implicated in the death of a recipient.

Nine of the 25 contaminated platelet units were collected by apheresis from single donors, 15 were recovered from whole blood donations (each from pooling of four donations) and for one the source of platelets was not specified. For 10 of these cases, the donor's arm was confirmed by subsequent testing to have been the probable source of the contamination. For some others, investigation of donors' arms was incomplete or inconclusive but the nature of the contaminating organism was suggestive of a skin contaminant that was most likely to have been introduced to the pack at the time of collection. For 2 cases, the donor's blood was concluded to have been the source of the contamination (i.e. endogenous bacteria, so contamination of the pack not preventable by skin cleansing or diversion).

Cumulative data about Hepatitis B virus transmissions

Nine of the ten reports of transfusion-transmitted HBV infections in the UK made since October 1995 have been concluded to be probably due to infectious blood collected from donors with acute HBV infection, with only one (reported in the first reporting year) due to infectious blood from a donor with later stage HBV infection. This is a change from that observed in earlier collations of transfusion-transmitted HBV. For example, between 1991 and 1997 only three of 14 transfusion-transmitted HBV infections reported to the Health Protection Agency were found to be due to donations from donors with acute infection, with the majority being due to donations from donors with chronic infection[22]. This change has implications for possible options to further reduce the risk of transfusion-transmitted HBV infection. The value of anti-HBc screening for detection of subliminal HBsAg at the end of carriage has declined, and the very sensitive HBsAg assays now in use lessen the potential additional yield which would be gained from HBV DNA testing.

COMMENTARY

- A total of 76 reports of incidents involving infections suspected to be due to transfusion were made to the NBS/HPA CDSC Transfusion Transmitted Infection Surveillance in 2003, the highest number of reports since the scheme began in 1995. Eight (11%) of the reports were concluded to be probably due to transfusion of an infectious unit of blood; three due to bacteria, four due to viruses and one due to malaria. One report was of the first possible case of transfusion transmitted vCJD.
- Each year, the number of transfusion-transmitted infections reported is small and fluctuations are to be expected. Also, the reporting system is probably biased towards ascertainment of investigations of infections that cause rapid onset of acute disease such as bacteria; in the cumulative data bacteria have accounted for the majority (62%) of reported transmissions by transfusion and the majority (88%) of known deaths due to transfusion transmitted infections.
- For two of the three reports of transfusion transmitted bacterial infection, the probable source was confirmed to be the donor's arm. This suggests that arm cleansing was inadequate to deal with the bacterial load. [despite improved cleansing protocol]. It is of interest that the low number of cases of transfusion transmitted bacterial infection in 2003 has followed the implementation of the strategy to divert the first 20-30 mL of the donation in 2002. The low number is unlikely to be due to under-ascertainment as a high number of reports of investigations of suspected bacterial infection have been received suggesting enhanced awareness and reporting of possible bacterial transmissions. This observation requires confirmation from continuing surveillance in future years. Improved arm cleansing and methods for testing platelets for bacterial contamination are being considered to further reduce the risk of bacterial contamination.
- Many of the 38 reports of PTR incidents (in England, Wales and Northern Ireland) involved cases where bacterial contamination was not clinically felt the most likely diagnosis, but the packs were returned for culture for the sake of completeness. In 2 cases, bacteria were isolated from the recipient but there was no evidence to implicate transfusion as the source of infection. In occasional cases full investigation was not possible because appropriate samples were not available. Conclusive investigation of a suspected bacteraemia in a transfusion recipient relies heavily on the collection and handling of relevant samples at the hospital where the transfusion was performed. It is recommended that hospitals seek advice from their local blood centre to ensure that cases are properly investigated.
- During 2003, reports were made of both transfusion transmitted HIV and HBV infections. The risk of an HIV or HBV infectious donation entering the blood supply still remains very low in the presence of the current routine testing protocol of blood donations; these include highly sensitive combined anti-HIV plus antigen assays and also HBsAg assays. The absence of any reports of transfusion transmitted HCV infections is consistent with the expected low risk of an HCV infectious donation entering the blood supply in the presence of anti-HCV and HCV RNA testing.

- The ascertainment of infection in 3 donors (HIV, HBV, HAV) led to the tracing and testing of recipients exposed to components collected during their potentially infectious periods. Recipients were initially asymptomatic at this time and may only have been identified by these investigations. This illustrates the importance of post-donation information and the need to act on it.
- In 2003, the first possible incident of transfusion-transmitted vCJD was reported. Human prion disease may be transmissible via blood transfusion, but this report represents only a single case of vCJD in a transfusion recipient and further evidence is required before the source can be confirmed. Precautions are currently in place to reduce the risk of transmission through blood transfusion. These include leucodepletion of all blood components (since 1999), the use of virally inactivated FFP obtained outside the UK for vulnerable groups (children born after 1st January 1996), importation of plasma for fractionation (since 1998) and the exclusion of donors who have received a blood transfusion in the UK since 1980 (implemented in April 2004).
- The Standing Advisory Committees (SAC) of the Joint UKBTS/NIBSC Executive Liaison Committee (JPAC) make recommendations to the Guidelines for the Blood Transfusion Services in UK in relation to the prevention of transfusion-transmitted infections. For example, SAC Transfusion Transmitted Infection (SACTTI) regularly reviews the residual risk of transfusion transmitted HCV, HIV and HBV infections to assess the need for additional testing methods, such as HIV RNA testing or anti-HBc. SAC Care and Selection of Donors ensures donor deferral criteria is optimal in terms of exclusion of donors with behaviour that may put them at high risk of infections.

RECOMMENDATIONS

- Transfusion-transmitted bacterial infection remains an avoidable cause of death and major morbidity and merits increased efforts to prevent bacterial contamination of blood components. These include:
    - Continuation of diversion of the first 20-30 mL of the donation (likely to contain any organisms entering the collection needle from the venepuncture site)
    - Careful attention to adequate cleansing of donors' arms
    - Adherence to BCSH guidelines (1999)[14] with regard to the visual inspection of blood components for any irregular appearance immediately prior to transfusion.

- UK Blood Services should continue to review and implement options available to minimise the risk of bacterial contamination of platelets.

- Hospitals should consult guidelines and the blood service about the investigation of transfusion reactions suspected to be due to bacteria. Attention should be paid to the sampling and storage of implicated units.

- Hospitals should continue to report and investigate all possible incidents of post-transfusion infection appropriately and adequately.