Dengue Fever

Contents

This page was last modified on 18 May 2016, at 10:51.

Condition

Dengue fever

Individual at risk

Recipient

Guidance at RECRUITMENT

Accept any donor with a known history of dengue infection or travel to a dengue risk area.

Guidance at CT

Defer for 4 weeks after full recovery from dengue fever and following travel to any country that is endemic for dengue fever. For the purposes of HPC donor assessment, those countries can be considered to include all malaria-endemic countries plus:

• American Samoa • Antigua and Barbuda • Aruba • Bahamas • Barbados • Brunei • Caribbean Netherlands (Bonaire, Saba and Saint Eustatius) • Cook Islands • Cuba • Curacao • Dominica • Fiji • French Polynesia (including Tahiti, Moorea, Bora-Bora) • Grenada • Guadeloupe (France) • Jamaica • Kiribati • Maldives • Marshall Islands • Martinique • Micronesia (Federated States of) • Nauru • New Caledonia and dependencies (France) • Niue • Northern Mariana Islands • Pacific Islands of the United States, other (including Johnston Atoll, Wake Island, Midway Island) • Palau • Puerto Rico • Saint Barthelemy (France) • Saint Lucia • Saint Martin (France) • Samoa • Singapore • Sint Maarten (Netherlands) • Taiwan • Tokelau (New Zealand) • Tonga • Trinidad & Tobago • Turks and Caicos Islands • Tuvalu • Wallis & Futuna Islands (France)

In addition, certain countries with limited inhabited tropical regions (eg Australia) experience seasonal epidemics of dengue fever without the level of endemicity characterised by the occurrence of dengue haemorrhagic fever. When such a country provides a donor, there should be a process in place to capture any travel to a dengue-epidemic region, and to treat such travel the same way as travel to a dengue-endemic country.

Where a donor resides in an area with endemic dengue risk, the transplanting physician must balance the potential risk of dengue transmission with the availability of alternative transplantation options. In particular, the risk of dengue infection is generally seasonal, and there seems a relative paucity of transfusion-transmitted cases reported in the literature compared with the large disease burden caused by DENV.

Guidance at WORK-UP

Where possible, delay collection until at least 4 weeks following the donor’s return from the dengue risk area.

Where transplantation is urgent and an alternative donor is not available, the transplanting physician may take into consideration the fact that the incubation period for dengue fever is generally less than 14 days, and usually in the range of 4 to 7 days. However, symptoms might be masked by GCSF side affects and lab diagnostics take > 1 day, so transplant physicians should better consider "incubation period + 1 week" in urgent cases.

Justification for guidance

Dengue virus (DENV) is a highly emergent mosquito-borne virus that is responsible for a significant worldwide disease burden affecting some 2.5 billion (40%) of the world’s inhabitants in tropical areas of Asia, Oceania, Africa, Australia and the Americas.

In the last 50 years DENV incidence has increased 30-fold, and this massive expansion is closely related to the mosquito vector's adaptation to urban environments. Hence dengue fever has become endemic in a number of developed urban areas in the tropics that have no malaria risk (eg Singapore), and thus the application of malaria exclusion criteria will not provide complete coverage of dengue risk.

Dengue fever classically presents as an acute febrile illness with sudden onset of severe headache, joint and muscle pain, nausea and vomiting. The incubation period following exposure to DENV can vary between 3-14 days (usually 4-7 days). A minority of cases progress to more severe forms such as dengue shock syndrome (DSS) and dengue haemorrhagic fever (DHF).

DHF is thought to result from an immunopathologic response in patients previously infected with a different serotype of dengue; hence may be considered an indicator of dengue endemicity.

However, the majority (50-85%) of DENV infections are asymptomatic. There is a known viraemic phase which can start 2-3 days prior to the emergence of symptoms and usually lasts 4-5 days during acute illness, but a viraemic period of up to 10 days has been reported.

There have been five reports of DENV transmission via blood transfusion – one in Hong Kong (2002), one in Puerto Rico (2007), and three in Singapore (2008). No DENV vaccine has yet been developed; treatment is generally supportive. No FDA licensed screening test is yet available. An NS1 antigen assay was submitted for FDA IND in 2010. A highly sensitive research nucleic acid testing (NAT) assay has been used for blood donor prevalence studies, however the manufacturer has not progressed to commercial release or submission for regulatory approval.

While the current "tropical diseases" policy effectively covers dengue risk, the length of the deferral (ie 6 months) and the huge geographical area affected (ie "tropical areas", which would generally be defined as all latitudes between 35 degrees north and 35 degrees south) are both somewhat larger than necessary for dengue risk. "The tropics" includes many developed areas where prospective donors may reside, and in addition includes many popular tourism destinations. Therefore, a more targeted approach such the one proposed here could greatly increase potential donor eligibility with no significant increase in risk.

References

1. Vaughn DW, Green S, Kalayanawoj S, Innis BL, Nimmannitya S, Santayakorn S, Endy TP, Raengsakulrach B, Rothman AL, Ennis FA, Nisalak A. Dengue Viremia Titres, Antibody Response Pattern, Virus Serotype correlate with Disease Severity. JID 2000;181:2-9.

2. Stramer SL, Hollinger, FB, Katz, LM, Kleinman, S, Metzel PS, Gregory KR, Dodd, R. Emerging infectious disease agents and their potential threat to transfusion safety. Transfusion 2009; 49 (Supplement).

3. Seed CR, Kiely P, Hyland CA, Keller AJ. The risk of dengue transmission by blood during a 2004 outbreak in Cairns, Australia. Transfusion. 2009; 49:1482-7.

4. Linnen JM, Vinelli E, Sabino EC, Tobler LH, Hyland C, Lee TH, Kolk DP, Broulik AS, Collins CS, Lanciotti RS, Busch MP. Dengue viremia in blood donors from Honduras, Brazil, and Australia. Transfusion. 2008; 48:1355-62.

5. Mohammed H, Linnen JM, Munoz-Jordan JL, Tomashek K, Foster G, Broulik AS, Petersen L, Stramer SL. Dengue virus in blood donations, Puerto Rico, 2005. Transfusion. 2008; 48:1348-54.

6. Teo D, Ng LC, Lam S. Is dengue a threat to the blood supply? Transfusion Med 2009; 19:66–77.

7. Chuang VW, Wong TY, Leung YH, Ma ES, Law YL, Tsang OT, Chan KM, Tsang IH, Que TL, Yung RW, Liu SH. Review of dengue fever cases in Hong Kong during 1998 to 2005. Hong Kong Med J. 2008; 14:170-7.

8. Guzman MG, Kouri G. Dengue: an update. Lancet Infect Dis. 2002; 2:33-42.

9. Stramer SL, Linnen M, Carrick M et al. Dengue donor viremia determined by RNA and NS1 antigen, and detection of dengue transfusion transmission during the 2007 dengue outbreak in Puerto Rico (abstract). Vox Sang (2010); 99 Supplement 1:32.