Malaria

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Basic information

A parasite infection of red blood cells, transmitted to humans by a particular type of mosquito (*Anopheles*) that is prevalent in rural tropical and sub-tropical settings.

Types

There are five known species of *Plasmodium* parasites that infect humans:

- *falciparum*
- *vivax*
- *ovale*
- *malariae*
- *knowlesi*

Individual at risk

Recipient

Risk factors for malaria in healthy donors

1. **Recent travel** – i.e. a history of visiting a malaria risk area within a defined time period prior to assessment.
    - Most guidelines define a time period of 12 months or less, though a period of up to 3 years may be utilised in order to cover an extended risk of relapsing *vivax* infection and/or to comply with European guidelines relating to unexplained fevers occurring after “tropical” travel.
2. **Past infection** – i.e. a known history of previous malaria infection.
    - In the context of young volunteer HPC donors, this can be defined simply as any malaria diagnosis at any time of life.
3. **Past residence** – i.e. a history of previous residence in a malaria risk area.
    - Most commonly defined as a continuous period of 6 months or longer.
    - European guidelines attribute risk to residence at any stage of life, but the highest risk occurs with repeated exposures from early childhood.

A donor who has recently travelled to a malaria risk area can develop symptomless malaria infection in situations like relapsing *P. vivax* infection and incomplete treatment with prophylactic anti-malarial medications.

A donor with a previous history of malaria infection can pose a risk to HPC recipients through semi-immunity or partial immunity to malaria – particularly if infected during childhood, which can occur without clear symptoms or a specific diagnosis.

A semi-immune individual remains susceptible to new malaria infection, but will be less likely to develop severe illness. In some cases, a semi-immune individual can develop prolonged symptomless infection after re-exposure to malaria, posing a risk to recipients if they donate blood or HPCs.

Malaria antibody testing, where available, can be useful in evaluating the risk of symptomless malaria in a healthy donor with a history of potential malaria exposure – especially the risk associated with malaria semi-immunity, which accounts for the overwhelming majority of cases of reported and potential transmission of malaria via blood products.

Note that regulations such as the European Directive for blood and tissues set a 4-month window period for malaria antibody testing, but the true window period is likely to be closer to 2 weeks.

Guidance at RECRUITMENT

1. **Recent travel:**
    - ***Any travel to a malaria risk area within the past 12 months.***

- ACCEPTABLE.

2. **Past infection**:
    - ***A known history of malaria infection at any time of life.***
    - ACCEPTABLE if the donor has fully recovered from malaria for a period of at least 12 months.
    - Registries located in countries with endemic malaria risk may wish to consider a shorter recovery period – e.g. ACCEPTABLE as long as the donor has fully recovered.

3. **Past residence:**
    - ***Previous residence in a malaria risk area or areas for a continuous period of 6 months or longer, at any time of life.***
    - ACCEPTABLE

Guidance at CT/WORK-UP

1. **Recent travel:**
    - ***Any travel to a malaria risk area within the past 12 months.***
    - ACCEPTABLE, but disclose risk to the transplant centre.
    - Registries located in a country with endemic malaria risk may wish to omit this question, or modify it to capture travel to higher-risk regions within the same country or other countries.
    - Malaria antibody testing, where available, can be useful to evaluate the possibility of symptomless infection following recent risk travel. Note that there have been case reports of relapsing *vivax* malaria in blood donors where antibody screening has been negative during an asymptomatic interval.

2. **Past infection**:
    - ***A known history of malaria infection at any time of life.***
    - ACCEPTABLE if the donor has fully recovered from malaria for a period of at least 12 months. Advise the transplant centre of the potential risk of semi-immunity – particularly if there has been subsequent or ongoing geographical exposure to malaria following recovery.
    - If the donor/registry is located in a country with endemic malaria risk and/or there is no alternative donor available, a shorter recovery period may be considered.
    - Malaria antibody testing, where available, is useful for detecting semi-immunity. In a donor with a past history of infection and subsequent/ongoing geographical exposure, the presence or absence of malaria antibodies is a useful indicator of the possibility of prolonged symptomless infection.
    - A positive antibody result should be further evaluated by testing for the presence of current infection – e.g. malaria PCR or antigen testing.

3. **Past residence:**
    - ***Previous residence in a malaria risk area or areas for a continuous period of 6 months or longer, at any time of life.***
    - ACCEPTABLE, but disclose risk to the transplant centre.
    - If the donor remains currently resident in a country with endemic malaria risk, further evaluation of the donor's individual risk is recommended because the geographic distribution of malaria risk is uneven within most endemic countries, while the likelihood of semi-immunity is increased by childhood and/or repeated exposure.
    - Malaria antibody testing, where available, is useful for detecting semi-immunity. In a donor with a history of past residence in a malaria risk area and subsequent/ongoing geographical exposure, the presence or absence of malaria antibodies is a useful indicator of the possibility of prolonged symptomless infection.
    - A positive antibody result should be further evaluated by testing for the presence of current infection – e.g. malaria PCR or antigen testing.

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