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Assessment of necessity of transfusions in vector-borne primary and secondary infections

Abstract

Parasites carried by mosquitoes and transmitted through them from animals to humans is increasingly an intermittently periodic, or persistently prevalent, epidemic and even at times a pandemic, predominantly in countries with poor sanitation conditions. Secondary parasite infections in surviving individuals who already have experienced a previous such infection are generally uncommon due to the same "carried" species but may later contract infection of a different parasite species. Dual simultaneous parasite species infections if they occur, generally certain to lead to lethality to the infected human at any age although and despite immunity variations are of weaker endurance in children and senior citizens than the middle aged, if a putative cohort of three different age groups possess innate immunity at levels considered as normal for their particular age group. Herein we discuss the need for nature and type of transfusions and thus hematology of the three parasites such as dengue, chikungunya, zika and malaria.

Keywords: mosquito, parasite, vector-borne, transfusion, hematology

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Introduction

Tropical/subtropical region habitat active at daytime mosquito, *Aedes (Ae.) aegypti* (Figure 1) originated from the African continent is the vector that transmits parasite species which cause fevers including dengue, chikungunya, zika, etc. The fever due to dengue[1] although is carried by the same vector, *Ae. Aegypt*i, the vector-borne virus is of *Flavirideae* family and flavivirus genus. Chikungunya is caused by *Togaviridae* family and its alphavirus genus. *Ae Aegypti* mosquito bites generally cause drop in blood platelet levels, with more severity and considerable frequency in dengue and quite rarely in chikungunya. Hemorrhagic fever when occurs is life threatening in dengue but is not associated with chikungunya. Zika (Forest in Uganda) virus[2,3] is also spread by *Flavirideae* virus family that includes vector mosquitos, *A. aegypti* and *A. albopictus*. On the other hand, malarial fever is caused by the *Plasmodium* parasitic protozoan whose vector is also a female mosquito, *Anopheles*. However despite comparisons, the focus of this article is on dengue and the need for transfusions if applicable.

Figure 1 The female mosquito, Aedes aegypti, concomitantly derives blood and introduces the dengue fever inflicting parasite flavirideae flavivirus on human host skin.

Hemorrhagic fever

Hemorrhaging during contraction of dengue infection and fever is generally life threatening and the need arises for prophylactic red cells and/or platelets transfusions to be administered.

Transfusions

When the platelet levels drop below 10,000/cumm, prophylactic platelet transfusions may be administered with extra care to prevent clotting. Severe systemic and even brain hemorrhaging will need such transfusions lest the infected patient die. Should a secondary or dual infection occur in the same human subject that may be rare but more likely as a separate event or occurrences, then these combined transfusions will be all the more necessary to be administered for such an infected patient.

Arsenic for dengue

Arsenic album although is poisonous in exceeding levels depending upon the concerned patient, is an effective homeopathy medicine treatment for dengue and has been in use in India for treatment of this infection-fever in addition to the platelets transfusions.

Conclusion

Low levels of dietary arsenic intake may facilitate ease of onset and severe persistence of dengue fever which is more likely to be dangerous and even lethal. However it is not suggested that normal blood arsenic levels in a previously uninfected human subject who later develops dengue infection is not susceptible to the ultimate clinical outcome. This of course varies with the infected patient and modes of treatment implementation.

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Conflict of interest

The author declares no conflict of interest.

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