

Vector-Borne Disease:

Malaria in Sub-Sahara Africa

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Introduction

Malaria is a vector-borne disease. Vector-borne diseases are “infectious diseases, caused by protozoa, bacteria, and viruses, that are spread by organisms such as mosquitoes and ticks” (Frumkin, 2010, p. 307). For malaria the sole culprit for spreading these diseases are mosquitoes. In the United States, it is uncommon to hear suffering from this disease but the same cannot be said in other countries in the world, where this disease is prevalent. In this paper I will be giving a description what malaria is, discuss its prevalence and health implication in pregnant women in sub-Saharan Africa and its prevalence in the Children of Uganda, and the impact of this vector-borne disease in a society.

According to Jacobsen (2014), “Malaria is a parasitic infection caused by protozoa of the *Plasmodium* species” (p. 236). Jacobsen (2014) discusses that there are “five types of *Plasmodium* known to cause human infection: *Plasmodium falciparum*, *P. vivax*, *P. malariae*, *P. ovale*, and *P. knowlesi*” (p. 236) Jacobsen then discusses that when humans with malaria are bitten by mosquitos, this causes the mosquito to become infected. Jacobsen (2014) then states “After the malaria parasites undergo several stages of development in the gut of the mosquito, they travel to the salivary gland of the mosquito and are injected into a human during a blood meal” (p. 237). All it takes is one bite from an infected person to commence the cycle of infection. Moreover, not all mosquitoes can transmit and cause malaria. The mosquitoes responsible for the transmission of malaria are the “female *Anopheles* mosquitoes that need a bloodmeal in order to produce and lay eqqs” (Jacobsen, 2014, p. 237). Considering how easily transmissible this disease is, without the proper preventative measures the cycle of infection between human and mosquito can become problematic.

The recommended ways to prevent mosquito bites are to “. . . apply an insect repellent that contains the active ingredient DEET to clothing and exposed skin . . .” (“Malaria and Dengue Fever,” 2011). It also mentions to use “. . . mosquito nets treated with insecticide (permethrin) to be used while sleeping [which] are very effective . . .” (“Malaria and Dengue Fever,” 2011). Also, “. . . insecticide sprays should be used to kill any mosquitoes indoors. . .” (“Malaria and Dengue Fever,” 2011). Implementing these methods of prevention in the household in an area in which malarial infections are prominent can aid in reducing the risk of obtaining malaria. If a malarial infection is acquired there is a recommended treatment for disease. Currently, “the WHO strongly urges the use of artemisinin-based combination therapy (ACT), which combines at least two different antimalarial drugs (such as artemether plus lumefantrine or artesunate plus mefloquine), because combination drugs slow the emergence of drug resistance [“Guidelines for Treatment,” 2010]” (Jacobsen, 2014, p. 240). Even with these recommended forms of prevention and options treatment, malaria is a major issues in various regions.

Examples

An example of the prevalence of malaria can be seen in Sub-Sahara Africa. In this region, it is “where more than 90% of malaria deaths occur . . . ; [“World Malaria Report,” 2011]” (Jacobsen, 2014, p. 238). In order to depict malarias prevalence I will focus on Sub-Saharan Africa region as a whole, when discussing the health effects of malaria on pregnant women. The next example will be will focus the health related effects of children who have malaria in Uganda, located in sub-Saharan Africa. The reason I choose these two populations is that they “are most at risk for severe complications and death” (Jacobsen, 2014, p. 237).

Malaria in Pregnant Women in Sub-Sahara Africa

The reason that pregnant women are more susceptible to this disease is due to the following reason:

Pregnant women are far more vulnerable to malaria than other adults: they are four times more likely to contract and twice as likely to die from malaria than other adults This is due to the typical immunosuppression associated with pregnancy and increased levels of the hormones cortisol and oestrogen. (“Malaria Consortium,” n.d.)

Due to this, the health implications are that “in Sub-Saharan Africa, the part of the world most affected by malaria, as many as 10 000 pregnant women die each year of malaria-related causes, chiefly anemia” (“The Global,” n.d.). Of course, anything that occurs to the mother negatively affects the fetus she carries in the womb. The problems that can arise is that “Malaria infection during pregnancy is associated with severe anaemia and other illness in the mother and contributes to low birth weight among newborn infants — one of the leading risk factors for infant mortality and sub-optimal growth and development” (“Malaria,” 2013). Aside from the immediate negative implications such as death and anemia, associated to malaria there can be other possible health implications as well. If a mother loses a child due this infection, this can possibly affect the mental health of the mother.

Malaria in Children in Uganda

Children are also greatly affected by this disease; an example would be “In the mid-west of Uganda, [where] malaria is a leading cause of death among children under the age of five” (“Pioneer Project,” 2013). Just to get an idea, “the global NGO, Malaria Consortium, estimates that in Uganda malaria kills between 70,000 and 100,000 people every year. . . . The majority of malaria victims are children under the age of five” (Kafeero, 2013). This amount of deaths in only one region shows how endemic this disease is. Moreover, the reason that children are highly

susceptible to malaria is that they “have not developed immunity to malaria yet” (“Malaria Worldwide”, 2014). Normally, “after repeated attacks of malaria a person may develop a partially protective immunity” (“Human Factors,” 2010). It is sad to see that the only way to obtain some immunity is to undergo various infection of this disease, considering that the health related effects is that “every 2 to 3 days (depending on the species of *Plasmodium*) the red blood cells rupture, releasing parasites and toxins into the bloodstream and causing fever, chills, and anemia (Jacobsen, 2014, p. 237). Also, “infection with any of the five species [of *Plasmodium*] can cause cyclic fevers, headaches, and joint pain, and can in some cases can cause organ failure and brain inflammation, especially in children” (Jacobsen, 2014, p. 236).

Analysis

Malaria is can be a debilitating disease in Sub-Saharan Africa and areas like Uganda. It is hard to imagine living in a world in which one bite from an infected mosquito can possibly mean the loss of life. It is unfortunate to know how detrimental a disease can be one region while in others, like the United States, it is unheard of is. Moreover, one of the problems that promotes this endemic disease is that “most of the households at greatest risk for malaria have little or no money available to spend on malaria prevention [Barat et al., 2004]” (Jacobsen, 2014, p. 242). The inability to purchases the necessary bed nets or insecticides to prevent this disease puts each individual in that house hold at greater risk in contracting malaria. Without the proper protection, there is no intermediate that halts the cycle of transmission and infection, which can continuously exacerbate what should be a manageable problem.

Besides the immediate health effects that can arise from an infection for a child and a pregnant women, there are other negative implications that branch out in other areas. For example, “a child may have several episodes of clini-cal malaria every year, and children carry

the risk of long-term reductions in school performance due to missed class days and continued weakness from anemia” (Jacobsen, 2014, p. 238). Similar negative attributes to this infection can be imposed to all other family members affected to this disease, because “each bout of malaria causes several days or weeks of lost productivity in terms of absence from work or school and the inability to work growing food and around the home [Cibulskis, Aregawi, Williams, Otten & Dye, 2009]” (Jacobsen, 2014, p. 238). As we can see, it is not only ones health that can be hindered but various aspect of an individual’s life. Furthermore, if we look at the negative implications to an entire region we can see that the “cost of lost productivity due to malaria extends to whole countries as well” (Jacobsen, 2014, p. 238). This is seen when “malaria-endemic countries also have lower rates of economic growth than countries without malaria [Sachs & Malaney, 2002]” (Jacobsen, 2014, p. 238). Overall, we can see how important it is to prevent this disease not only for an individual but also for the countries affected, which can suffer due to the negative association of this disease.

In conclusion, even though it is uncommon in the United States, malaria is still a prevalent issue in various regions of the world. A large region where malaria is endemic is found in Sub-Saharan Africa and one of the specific locations in which malaria holds captive in the region is Uganda. We were able to see the various health implications this disease can do in these regions, even with the current preventative measures and treatments. Unfortunately, those affected detrimentally in a population by this disease are the children and pregnant women, which is attributed to lack of immunity. Even though the preventative measures are available, the inability to afford these measures also plays a factor in this endemic disease, which can mean the difference between good health and a better economic standing.

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