Malaria, the Ever–Present Threat

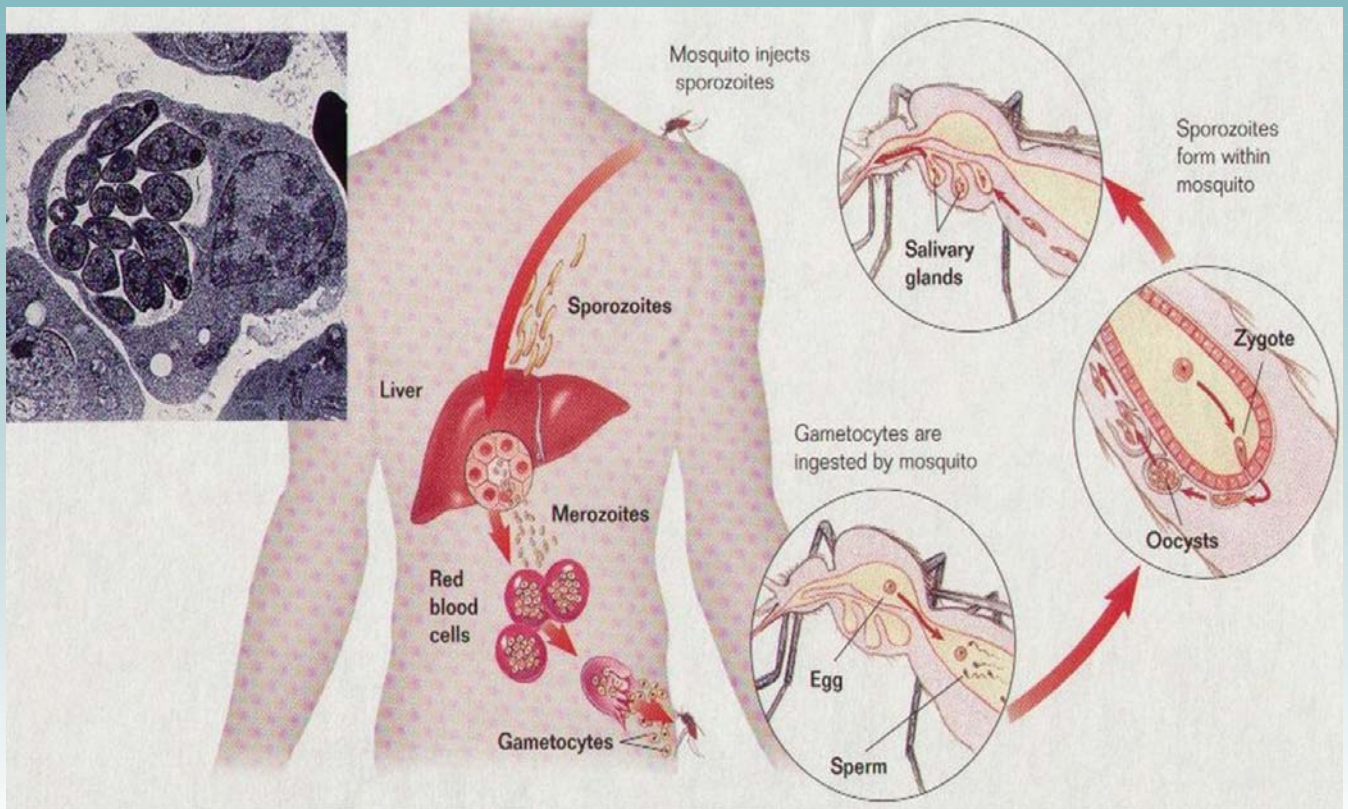
By Joann M. Schulte

Each year Florida reports approximately 60 to 70 cases of malaria, most of which are acquired overseas. In Florida, malaria was eradicated in the 1950s after centuries of misery caused by the disease. Malaria was a major reason that the southern portions of Florida were not well populated until the late 19th and early 20th centuries. Eradication of malaria was mainly due to improvements in the country's economic status, housing, access to health care and mosquito control.[i] Even today, the Florida Department of Health is especially vigilant in guarding against the return of malaria because the state has a subtropical climate and Anopheles mosquitoes capable of transmission are present in the state. We make major efforts to ascertain whether reported cases are acquired locally or overseas.

Our entire public health community was reminded of malaria in a most unwelcome way last summer. Eight cases of malaria were reported in one Florida county between July and September 2003, causing major concern to the state and the Florida Department of Health.[ii] Those eight cases were determined to be autochthonous transmission after a comprehensive investigation.[iii] Autochthonous malaria is defined as infection acquired through mosquito-borne transmission in a specific geographic area. Such malaria cases are exceedingly uncommon in the United States.

Most cases of malaria were reported by residents traveling overseas for a variety of reasons. We can never let our guard down, and this experience reminds us of how interconnected the state is with the rest of the world and how mobile the population is. Some Floridians who develop malaria are business travelers going to the Caribbean and Central and South America. Some are tourists visiting Africa, Southeast Asia and other destinations where malaria remains an endemic, deadly scourge. Others who acquire malaria overseas are Florida residents who were born abroad in nations where malaria is endemic and who now return home regularly to visit relatives. These constant comings and goings by Florida residents are mirrored by the travels of other visitors to Florida who come from all over the globe.

The experience with those eight cases of malaria was a major public health concern for the state and a reminder of how the prevalence of malaria continues to increase in many areas of the globe. Malaria mortality and morbidity are especially serious in Sub-Saharan Africa. That geographic region is estimated to have 90 percent of the globe's total incidence and



mortality. Experts have estimated that malaria accounts for 10 percent of Africa's diseases. Pregnant women and children younger than five years of age are especially vulnerable to the devastating effects of the disease.[iv]

In recent years donor nations and other donor organizations have renewed calls for a more concentrated effort at managing and controlling malaria. Without these groups who donate the money to pay for the drugs and vaccine trials, poor countries would not have malaria programs. The statistics on malaria globally are staggering. An estimated 300 million to 500 million cases occur worldwide each year, and up to 2.7 million of those cases die.[v] Changing this picture worldwide will require strong political will, extensive financial backing and sustained public health efforts.

Key elements in this renewed effort to control malaria include the ability to diagnose malaria infection and properly use antimalarial drugs.[vi] One of the most difficult areas in therapy is the cost of drugs and the fact that older drugs are becoming less effective as malaria parasites develop resistance. This problem is illustrated by the case of chloroquine, which has typically been affordable and the first-line therapy in Africa.

However, the malaria parasite

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common in Africa (Plasmodium falciparum) has developed resistance to chloroquine, and countries must now deal with therapy with multiple drugs.[vii] Such efforts are difficult in parts of the world where health dollars are limited. One possible partial solution to this resistance has been better use of drugs with directly observed therapy, a technique used by tuberculosis control programs. Community workers monitor therapy for patients taking tuberculosis drugs and have been successful in combating multiple drug resistant tuberculosis. Other measures that have been considered are better control of the supply of drugs because many of the poorer countries do not have a prescription drug system like ours, and people buy one pill at a time or don't see a doctor. The result is improper dosing, incorrect drugs, and insufficient therapy, all of which help promote drug resistance.

Other control measures are also assuming increased importance in malaria eradication. One such measure is the use of insecticide-treated nets that can provide protection during the dusk and dawn periods when malaria-transmitting mosquitoes are most active.[viii] These nets are a major improvement in the use of physical barriers and chemical control, and excellent results have been reported in field trials. A more widespread use of such nets could be a prime control measure and one that will assume increased importance given the drug resistance problems that are developing around the globe.

A noteworthy measure in controlling mosquito populations is consideration of how development projects for communities impact on mosquito breeding habitats. Certainly in the United States during the 1930s and

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1940s, repeated studies showed how the construction of dams and bridges, airports and other major building projects could produce enhanced breeding areas for mosquitoes if malaria was not considered. It is imperative that construction projects include an analysis of how drainage and sanitary conditions could adversely impact a country's health by increasing mosquito breeding grounds.

The development of an effective vaccine is vital and perhaps it is the ultimate tool for malaria control. A vaccine-testing network has been re-established in Africa, and the genome of the malaria parasites have been mapped in research labs. This knowledge has been applied in the development of the vaccines that are currently being tested in clinical trials.

Another crucial component of the successful campaign to eradicate malaria will be to increase understanding of donor organizations and donor countries about the need for a sustained, well-funded program. Shortly after World War II, malaria eradication efforts were undertaken with heavy reliance on the use of spraying and pesticides. Initially, that strategy was viewed as successful, but mosquitoes developed resistance to pesticides, and malaria resurged. Donor organizations and medical staff became discouraged, and malaria advanced again. Everyone concerned with eradicating or controlling malaria needs to recall that this disease has been an historic enemy for mankind. Major diseases, including sickle cell anemia and thalassemia, were shaped by the geographic distribution of Anopheles mosquitoes capable of transmitting malaria. A disease that has shaped entire populations' histories is a tough adversary that will require intelligent, long-term efforts to conquer.

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