New research confirms potential deadly nature of emerging new monkey malaria species in humans

September 9 2009

Researchers in Malaysia have identified key laboratory and clinical features of an emerging new form of malaria infection. The research, funded by the Wellcome Trust, confirms the potentially deadly nature of the disease.

Malaria kills more than a million people each year. It is caused by malaria parasites, which are injected into the bloodstream by infected mosquitoes. Of the four species of malaria that commonly cause disease in humans, *Plasmodium falciparum*, found most commonly in Africa, is the most deadly. *P. malariae*, found in tropical and sub-tropical regions across the globe, has symptoms that are usually less serious.

Recently, researchers at the University Malaysia Sarawak, led by Professors Balbir Singh and Janet Cox-Singh, showed that *P. knowlesi*, a malaria parasite previously thought to mainly infect only monkeys - in particular long-tailed and pig-tailed macaques found in the rainforests of Southeast Asia - was widespread amongst humans in Malaysia. Subsequent reports in neighbouring Southeast Asian countries have led to the recognition of *P. knowlesi* as the fifth cause of malaria in humans.

Now, in a study published in the journal *Clinical* Infectious Diseases, Professors Singh and Cox-Singh, together with colleagues from University Malaysia Sarawak, Kapit Hospital and the University of Western Australia, have published the first detailed prospective study of

the clinical and laboratory features of human *P. knowlesi* infections.

"*P. knowlesi* malaria can easily be confused with *P. malariae* since these two parasites look similar by microscopy, but the latter causes a benign form of malaria," says Professor Singh. "In fact, because the *P. knowlesi* parasites reproduce every twenty four hours in the blood, the disease can be potentially fatal, so early diagnosis and appropriate treatment is essential. Understanding the most common features of the disease will be important in helping make this diagnosis and in planning appropriate clinical management."

The researchers initially recruited over 150 patients admitted to Kapit Hospital in Sarawak, Malaysian Borneo, between July 2006 and January 2008 who had tested positive with a blood film slide for Plasmodium species. Using molecular detection methods, *P. knowlesi* was found to be by far the most common infection amongst these patients, accounting for over two-thirds of all cases.

As with other types of malaria in humans, *P. knowlesi* infections resulted in a wide spectrum of disease. Most cases of infection were uncomplicated and easily treated with chloroquine and primaquine, two commonly used anti-malarial drugs. However, around one in ten patients had developed complications and two died. Complications included breathing difficulties and kidney problems (including kidney failure in a small number of cases), which are also common in severe P. falciparum cases. Although the researchers saw a case fatality rate of just under 2%, which makes *P. knowlesi* malaria as deadly as P. falciparum malaria, they stress that an accurate fatality rate is hard to determine given the relatively small number of cases studied so far.

All of the *P. knowlesi* patients - including those with uncomplicated malaria - had a low blood platelet count. In other human forms of malaria, this would only be expected in less than eight out of ten cases.

In addition, the *P. knowlesi* platelet counts tended to be significantly lower than for other malarias. However, even though blood platelets are essential for blood clotting, no cases of excessive bleeding or problems with clotting were identified. The researchers believe the low blood platelet count could be used as a potential feature for diagnosis of *P. knowlesi* infections.

Recently, there have been cases of European travellers to Malaysia and an American traveller to the Philippines being admitted into hospital with knowlesi malaria following their return home.

"The increase in tourism in Southeast Asia may mean that more cases are detected in the future, including in Western countries," says Professor Singh. "Clinicians assessing a patient who has visited an area with known or possible *P. knowlesi* transmission should be aware of the diagnosis, clinical manifestations, and rapid and potentially serious course of *P. knowlesi* malaria."

Source: Wellcome Trust (news : web)