The CIWEC Clinic Health News

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Malaria advice for travelers to Nepal

What is malaria?

Malaria is a parasitic infection of the blood transmitted by night-biting mosquitoes. The parasite Plasmodium multiplies in the liver before infecting red blood cells. Symptoms of malaria include fever, chills, headache, vomiting and can appear 10-15 days or later following a mosquito bite. If not treated promptly, the severe type of the disease caused by Plasmodium Falciparum malaria may be rapidly fatal, especially in children and pregnant women. Malaria risk is highest in Sub Saharan Africa where Plasmodium Falciparum is predominant. Risk is much lower in Asia and South America where the predominant malaria species is Plasmodium Vivax which causes a less severe form of the disease. However, infection caused by P.Vivax can stay dormant in the liver causing a late relapse.

What is the risk of malaria in Nepal?

Although there are reports of about 5000 malaria cases with 10 deaths per year among the Nepalese, the risk for the average tourist or expatriate seems very low in Nepal. In the 26 year history of the CIWEC Clinic taking care of travelers and expatriates, there have only been 2 cases of Vivax malaria that **may** have been acquired from within Nepal. We believe that there is no malaria risk in Kathmandu, Pokhara or the mountain trekking areas. This being said, malaria does exist in the southern belt of Nepal (the Terai) and risk is highest in the hot, rainy summer monsoon. Most malaria in Nepal is Vivax (90%) and Falciparum is around 10% but the latest WHO statistics report Falciparum malaria rates of 17 %. There are 12 priority districts for malaria. These higher risk districts are Dandeldhura, Kanchanpur, Kailali, Bardia in the far west; Nawalparasi in central terai; Sindhuli, Mahottari, Dhanusha in east central; Morang, Jhapa and Ilam in far east; and Kavre immediately east of Kathmandu valley. These are called priority districts not only because they have had higher number of malaria cases but because they have had higher rates of Falciparum malaria.

Chitwan, although it lies in the Terai, has a very low malaria risk. In the year 2002, there were 6000 cases of fever in Chitwan during the months of June and July. This was related to an outbreak of Typhoid Fever and no malaria cases were detected. As a result of this, we recommend mosquito precautions but generally do not recommend any malaria medication prophylaxis for short visits to Chitwan national park even in the monsoon season. It has to be realized that risk seems very low but it cannot be considered zero in the hot monsoon months. Malaria preventative medication is recommended for trip/residence in the Terai particularly if trip involves travel to one of the 12 priority districts in the hot months from April to October. Risk of malaria in Nepal is highest in the months of June, July and August.

How do you prevent malaria in Nepal?

Malaria prevention means protecting from mosquito bites and taking medication to suppress the disease. Medications do not prevent initial infection; they suppress or prevent symptoms caused by blood stage parasites. Since malaria is transmitted by the bite of mosquitoes, it is just as important to prevent bites as it is to take tablets.

1. **Protection against mosquito bites** – First of all, avoid getting bitten. Malaria causing mosquitoes bite at night. Avoid time spent outdoors without protection. When outdoors, cover up with long sleeved clothing and pants. Use insect repellent (e.g. DEET 30%) on exposed parts of the body. It is safe in children > 2 months of age. Avoid hands, eyes and under clothing. Apply once a day and wash off with soap and water after you are indoors. Use a fan, stay in a well-screened or air-conditioned room or use Permethrin-impregnated mosquito nets.

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2. **Consider taking malaria prophylaxis medication** -There is no malaria tablet that is perfectly safe. The risk of acquiring malaria must outweigh the risk of taking the medication. Consider each option carefully and discuss with your nurse or doctor which tablet will suit you best. This should take into account your personal health condition, degree of risk depending on area of travel, type of malaria found in the country/city of travel and cost of medication. If significant malaria risk exists, putting up with minor side effects is preferable to catching cerebral malaria. Malaria is a serious disease that you should do everything you can to avoid. Because other causes of fever are so vastly more common than malaria, we discourage the use of standby self-start malaria treatment. Certain other medications (e.g. antacids) may decrease the absorption of the malaria medication and should not be taken concomitantly.
3. **See a doctor immediately if symptoms of fever develop** – This is true even if you have been taking a malaria-preventative medication whilst traveling in malaria endemic region. As stated before, certain type of malaria may be rapidly fatal and early diagnosis and treatment can be life-saving.

Which medications are used to prevent malaria in Nepal?

In many parts of the world where Falciparum malaria exists, the parasites have developed resistance to Chloroquine; this is true in Nepal as well. Although currently recommended by some international travel authorities; because of emerging resistance in Nepal, Chloroquine is not fully preventative. Therefore, the combination of Chloroquine and Proguanil is no longer an ideal prophylaxis. The CIWEC Clinic does not currently stock Chloroquine and Proguanil (Paludrine). The medications that we advise people to consider for high risk travel are Mefloquine, Doxycycline or Atovaquone/proguanil (Malarone).These are available at the clinic as walk-in visits.

Mefloquine (Lariam): Although Mefloquine (Lariam) is very effective and well tolerated by majority of users, it can cause troublesome side effects in up to 15% of users. Mefloquine has been reported to cause trouble sleeping, dizziness, peculiar dreams, feelings of disorientation, confusion, mood swings, anxiety, depression, nausea, stomach discomfort, visual disturbances, and palpitations.

These effects can be most unpleasant but are reversible on stopping the drug. The effects usually occur within the first few doses, hence the need to start one to two weeks before travel. Do not take mefloquine on an empty stomach or within 24 hours of heavy alcohol use or these symptoms will be much worse. Taking the medication with dinner and plenty of water will decrease the risk of side-effects.

Mefloquine can be used in children and in the second and third trimester of pregnancy. Women should use reliable contraception while taking it, and for three months after the last dose.

Mefloquine is not recommended for travelers with a personal or family history of psychiatric or seizure disorders. If unexplained anxiety, depression, hallucinations, severe nightmares or confusion occur, you must stop taking this drug and see a doctor.

Mefloquine may interfere with tasks requiring fine co-ordination. It is not recommended for pilots and scuba divers. Quinine (eg.for cramps) should not be taken at the same time as Mefloquine. This drug has had much bad publicity, much of it undeserved. It is certainly not a perfect pill, but suits many people and is most useful in areas where the malaria risk is great. The tablet is taken weekly.

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Doxycycline: Doxycycline is an antibiotic that is as effective as Mefloquine and Atovaquone/Proguanil against Chloroquine-resistant Falciparum malaria. It should not be taken by children under 8 years of age or by pregnant and breastfeeding women. Do not take Doxycycline if you are allergic to Tetracycline drugs. Some. people are more prone to sunburn whilst taking this medication, therefore avoid excessive sun exposure (use a hat and good quality sunblock).

It is most important to take Doxycycline with food and a full glass of water/liquid to prevent irritation of the esophagus, felt as pain or burning in the center of the chest. **Do not take doxycycline before going to bed or even lying down.** It is preferable to avoid antacids (e.g Gelusil, Mylanta) whilst taking doxycycline. Doxycycline use may promote vaginal itching or thrush. Women prone to thrush after antibiotics should carry a supply of anti- thrush medication just in case. The tablet is taken daily.

Malarone (Atovaquone/proguanil): This drug combines anti-malarial properties of 2 drugs atovaquone 250mg and proguanil 100mg in a single tablet. The drug is effective against both liver and blood stages of the malaria parasite. Because of this, the drug can be discontinued one week after leaving the malaria risk area. It is as effective (>95%) as doxycycline and mefloquine against chloroquine resistant falciparum malaria. It can be taken for short term use for malaria prevention. It cannot be taken by children weighing less than 5kg, pregnant women or by patients with severe kidney disease. This drug is extremely well tolerated and the most common side effects are gastro-intestinal including nausea, vomiting, abdominal pain - but no more commonly than with a placebo. The tablet is taken daily.

How to take malaria tablets?

With food !!!! You will have fewer side effects if you take your tablets with a large glass of water and meal - have some of your meal, take your tablets and then finish your meal.

Same day each week Weekly tablets must be taken on the same day each week e.g. "Monday is Malaria day"

To the bitter end If you stop your tablets early, you may get malaria. These tablets are not like regular antibiotics- they take many weeks to kill all the malarial parasites.

If You Forget a Dose

Weekly tablets: Take it the day you remember. Provided it is only one day late, you can continue on the original day for subsequent doses. If it is several days late you need to take subsequent tablets on the new day.

Daily tablets: Take it the day you remember and continue daily doses. Do not take extra tablets per day to make up for the ones you missed. If you have missed tablets you may get malaria. If fever develops, remember you must see a doctor as soon as possible.

Alcohol

You may drink alcohol in moderation whilst taking malaria tablets. However, heavy alcohol consumption within 24 hours of a dose of Mefloquine (Lariam) is likely to provoke hallucinations, anxiety, behavior changes or even epileptic fits.

Do the tablets have side-effects?

Unfortunately, yes. Research has found up to 40 % of people taking malaria pills will get side effects. Usually these side-effects are minor, and do not mean you should stop your pills. Start your tablets before departure, so if they are causing problems you can discuss with the doctor before you go. Sometimes the type of tablet or dosage may need to be altered.

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How are the medications taken?

Mefloquine. Start 1-2 weeks before, take weekly and for **4** weeks after.

Doxycycline. Start 1-2 days before, take daily and for **4** weeks after.

Atovaquone/proguanil (Malarone). Start 1 day before, take daily and for 1 week after.

No tablet is 100% effective in preventing malaria

1. **Avoid mosquitoes**
2. **Take malaria tablets regularly**
3. **Evaluate all fevers immediately**

Special Situations

Malaria prevention in children: Mefloquine can be used in children of all ages and weights. Doxycycline can be used in children who are at least 8 years of age. Atovaquone/proguanil (Malarone) can be used in children greater than 5Kg (11 lbs). Antimalarial tablets can be quite bitter and come only in tablets. Pharmacists can be requested to pulverize the needed amount and prepare capsules for each dose. Capsules can be opened and medication mixed with palatable food before administering to the child. Pediatric doses of antimalarial medication are currently not available at the CIWEC Clinic. Since request for pediatric tablets have been very few over the years, we have not been stocking up on these.

Malaria prevention in pregnancy: Malaria infection in pregnant women can be more severe than in non-pregnant women. Malaria can also increase the risk of untoward pregnancy outcomes. Since no prophylactic regimen is completely effective, it is best if travel to malaria endemic areas can be postponed or avoided by women who are pregnant or likely to be pregnant during the trip. If a trip has to be made, Mefloquine is the only drug that is considered safe for use in second and third trimester of pregnancy. It may also be safe in the first trimester of pregnancy.

Malaria prevention during breastfeeding: Very small amounts of Chloroquine and Mefloquine are excreted in the breast milk of lactating women and these drugs can be used by breastfeeding women for malaria prevention. The amount of drug transferred is not thought to be harmful to the nursing infant but the dosage transferred through breast milk is not sufficient to provide adequate antimalarial protection. Doxycycline is not recommended for prophylaxis in breast feeding women though data on this is limited. Atovaquone/Proguanil is not recommended in women who are breastfeeding infants weighing less than 5kg.

Prevention of relapse of Vivax malaria or terminal prophylaxis with Primaquine: P.Vivax parasites can persist in the liver and can cause a late relapse for as long as 4 years after leaving the malarious areas. Presumptive anti-relapse therapy with Primaquine can decrease the risk of relapses by acting against the liver stage parasites. Primaquine can cause hemolysis in persons who are deficient in an enzyme called Glucose 6 Phosphate Dehydrogenase (G6PD). Before recommending Primaquine, one has to make sure that G6PD level is normal in an individual. G6PD levels can be checked at the CIWEC clinic but because the risk of malaria in Nepal seems low, terminal prophylaxis is generally not recommended. Exceptions may be individuals who are residing long term in the 12 priority districts.

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Suggested websites for further reading:

1. **http://wwwn.cdc.gov/travel/yellowBookCh4-Malaria.aspx**
2. **http://www.phac-aspc.gc.ca/media/advisories_avis/mal_faq-eng.php**
3. **http://www.nathnac.org/travel/index.htm**
4. **http://www.who.int/topics/malaria/en/**

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