Malaria Prevention in the Pregnant Woman

Malaria is a serious illness. It is transmitted by the bite of an infected Anopheless mosquito. There are several types of malaria parasites, Plasmodium falciparum and P. malariae, P. vivax and P. malariae. Pregnant women traveling to Central and South America, Hispaniola, Africa, Asia (including the Indian Subcontinent, Southeast Asia, and the Middle East), Eastern Europe, and the South Pacific may be at risk for this potentially deadly disease.

All travelers to areas with malaria transmission, including pregnant women, should protect themselves from malaria. This is done by taking an antimalarial drug and by preventing mosquito bites. Despite the risk, most travelers can avoid becoming ill with malaria by taking these precautions. Pregnant women should avoid traveling in malaria infected areas unless it is necessary. The incubation period from the time of a bite from an infected mosquito to getting symptoms is 7 to 30 days. P. falciparum has a shorter incubation period and the P. malariae has a longer incubation period. The P. vivax and P. malariae are the most common cause of relapses. This is because they can locate themselves in the liver even after treatment.

KNOW YOUR RISK OF MALARIA

Caution: Travel to a Malaria Risk-area During Pregnancy is NOT Recommended.

- It is best if you do not travel to a malaria risk-area during your pregnancy. If you get malaria, you may become more ill because you are pregnant.
- Malaria can be a major risk to your pregnancy. The very high fevers, shaking chills, and other problems that occur with malaria can cause:
  - Anemia.
  - Intrauterine growth restriction (IUGR).
  - Premature birth.
  - Miscarriage.
  - Stillbirth.
- If you must travel, take a drug to prevent malaria (*antimalarial drug*). This will reduce but not eliminate the risk of developing malaria. Your caregiver will need to prescribe your antimalarial drug.
- Experience with the recommended antimalarial drugs show that they are safe to take while pregnant. It is safer for you and your pregnancy than getting malaria would be.
- Depending on which countries you will travel to, your caregiver will recommend either chloroquine or mefloquine. Experience with chloroquine and limited experience with mefloquine indicates that they are safe to take during pregnancy, including the first trimester.
- Pregnant women should **NOT** take the following antimalarial drugs:
  - Malarone™.
  - Doxycycline.
  - Quinine.
  - Fansidar.
  - Primaquine.

These drugs are either not safe to take during pregnancy, or there is not enough information to judge their safety.

- Mosquitos carrying this parasite may be resistant to both the anti-malaria medication and insecticides.

SYMPTOMS

- Fever.
- Chills.
- Sweating.
- Headache.
- Muscle aches.
- Weakness and tiredness.
- Nausea and vomiting.

SIGNS

- Enlarged spleen.
- Enlarged liver.
- Mild jaundice (yellow skin and eyes).
- Fast breathing.
- Convulsions.
- Neurologic (nerve) problems.
- Coma.

DIAGNOSIS

- Usually a diagnosis is made from the symptoms and signs of the patient.
- Blood tests to find antibodies against the parasite.
- Blood tests that find the antigen produced because of the parasite.
- Seeing the parasite under the microscope.
- Drug resistant tests on cultured malaria parasites. (This is done using an antimalaria drug against the parasite in the laboratory).
- Molecular test, using the DNA of the parasite to see if it is the malaria parasite. This is an expensive test. It requires special equipment and a specialized laboratory.

To find out if your travel will take you into an area with malaria :

- Visit CDC's Traveler's Health website at http://www.cdc.gov/travel
- Call CDC's Voice Information Line at 1-877-FYI-TRIP (1-877-394-8747), and listen to pre-recorded messages.
- Request a fax from CDC's Fax Information Service at 1-888-232-3299.
- Identical malaria prevention information is provided at the CDC website and through CDC's toll-free Fax Information Service.

FIND OUT WHICH ANTIMALARIAL DRUG IS RECOMMENDED FOR YOU

- Antimalarial drugs are only available by prescription through a caregiver.
- You should be prescribed either chloroquine or mefloquine depending on the area of the world in which you are traveling and any other medical conditions you may have.
- Find the drug prescribed for you in the listing below. Read the directions for use and side effects. If you have any questions about the drug recommended, call your caregiver or pharmacist.
- Treatment should be started within 24 hours of symptoms when possible.
- In severe cases, when the medication cannot be taken orally, it can be given through the vein.

ANTIMALARIAL DRUG WARNINGS AND INSTRUCTIONS

- Take your antimalarial drug exactly on schedule. Missing or delaying doses may increase your risk of getting malaria.
- For the best protection against malaria, it is important to keep taking your drug as recommended after leaving the malaria-risk area. (This is 4 weeks for mefloquine and chloroquine). Otherwise, you can develop malaria.
- Overdose (taking too much of an antimalarial drug) can be fatal. Keep drugs in childproof containers. Keep them out of the reach of children to prevent accidental poisoning.
- Buy your drugs in the U.S. or Canada before traveling overseas. Drugs purchased overseas may not be made according to U.S. standards and may not work as well. They may also be dangerous. They may:
  - Contain the wrong drug.
  - Contain an incorrect amount of active drug.
  - Be contaminated.
- Halofantrine (also called Halfan) is widely used overseas to treat malaria. CDC recommends that you do not take it because of serious heart-related side effects, including deaths.
- You should avoid using antimalarial drugs that are not recommended unless you have been diagnosed with life-threatening malaria and no other treatment options are available.

MEFLOQUINE

Pregnant women traveling to malaria-risk areas in South America, Africa, the Indian subcontinent, Asia, and the South Pacific should take mefloquine as their antimalarial drug.

Directions For Use

- The adult dosage is 250 mg (one tablet) once a week.
- Take the first dose 1 week before arrival in the malaria-risk area.
- Take your dose once a week, on the same day of the week, while in the risk area.
- Take your dose once a week for 4 weeks after leaving the risk area.
- Take the drug on a full stomach with a full glass of liquid.

Side Effects and Warnings

- The most common side effects reported by travelers taking mefloquine include:
  - Headache.
  - Nausea and vomiting.
  - Chills.
  - Dizziness.
  - Fainting.
  - Irregular heart beats.
  - Ringing in the ears.
  - Muscle pains.
  - Skin rash.
  - Difficulty sleeping.
  - Anxiety.
  - Vivid dreams.
  - Visual disturbances.
- Mefloquine has rarely been reported to cause serious side effects, such as seizures, depression and psychosis. These serious side effects are more frequent with the higher doses used to treat malaria. Fewer occurred at the weekly doses used to prevent malaria.
- This drug is eliminated slowly by the body. It may stay in the body for a while even after the drug is discontinued. So side effects it causes may continue weeks to months after the drug has been stopped.
- Most travelers taking this do not have side effects serious enough to stop taking the drug. (Other antimalarial drugs may be available if you cannot tolerate mefloquine. See your caregiver.)

Travelers who should not take Mefloquine

The following travelers should not take mefloquine and should ask their caregiver for a different antimalarial drug:

- Persons with active depression or a recent history of depression.
- Persons with a history of psychosis, generalized anxiety disorder, schizophrenia, or other major psychiatric disorders.
- Persons with a history of seizures (does not include the type of seizure caused by high fever in childhood).
- Persons allergic to mefloquine.
- Pregnant women traveling to malaria-risk areas in Mexico, Haiti, the Dominican republic and certain countries in central America, the Middle East, and Eastern Europe. They should take either chloroquine or hydroxychloroquine sulfate as their antimalarial drug.
- Nursing mothers should discuss it with their caregiver to weigh the risks of taking the drug.

CHLOROQUINE / BRAND NAME ARALEN™ AND GENERICS

Directions for use:

- The adult dose is 500 mg chloroquine phosphate once a week.
- Take the first dose 1 week before arrival in the malaria-risk area.
- Take your dose once a week, on the same day of the week, while in the risk area.
- Take your dose once a week for 4 weeks after leaving the risk area.
- It should be taken on a full stomach. This will lessen the risk of nausea and stomach upset.

Side Effects and Warnings

- The most common side effects reported by travelers taking chloroquine include:

- Nausea and vomiting.
- Loss of appetite.
- Headache.
- Dizziness.
- Blurred vision.
- Convulsions.
- Ringing in the ears.
- Muscle weakness.
- Change in the pigment and loss of hair.
- Skin rash and itching.

- Chloroquine may worsen the symptoms of psoriasis. Most travelers taking chloroquine do not have side effects serious enough to stop taking the drug. Other antimalarial drugs are available. See your caregiver.
- Note: In malaria-risk areas where chloroquine is the recommended drug, but chloroquine cannot be taken, mefloquine can be used.
- Ask your caregiver for a different drug if you have allergies to chloroquine.
- Nursing mothers should discuss taking this drug with their caregiver to weigh the risks before taking it.

HYDROXYCHLOROQUINE SULFATE/ BRAND NAME PLAQUENIL™

Hydroxychloroquine sulfate is an alternative to chloroquine phosphate. But less evidence exists on its effectiveness as an antimalarial drug.

Directions for use:

- The adult dosage is 400 mg once a week.
- Take the first dose 1 week before arrival in the malaria-risk area.
- Take your dose once a week, on the same day of the week, while in the risk area.
- Take the dose once a week for 4 weeks after leaving the risk area.
- Take it on a full stomach to lessen nausea and stomach upset.

Side Effects and Warnings

- The following side effects have been reported with the use of this drug:
  - Nausea and vomiting.
  - Loss of appetite.
  - Abdominal cramps.
  - Headache.
  - Dizziness.
  - Blurred vision.
  - Difficulty sleeping.
  - Irritability.
  - Nervousness.
  - Ringing in the ears.
  - Itching.

Minor side effects usually do not require stopping the drug.

- Psychosis, convulsions, deafness, hair loss, anemia, skin rash and weight loss may.
- Anyone with vision problems should be examined by an eye specialist (*ophthamologist*) before taking Plaquenil.
- Hydroxychloroquine sulfate may worsen the symptoms of psoriasis. Other antimalarial drugs are available. See your caregiver.
- In malaria-risk areas where hydroxychloroquine sulfate is the recommended drug but hydroxychloroquine sulfate cannot be taken, mefloquine can be used.
- Nursing mothers should discuss taking Plaquenil with their caregiver to weigh the risks before taking the medication.

Pregnant women should NOT take doxycycline, primaquine, Farsidar, quinine or Malarone™ to prevent malaria.

KNOW THE SIGNS AND SYMPTOMS OF MALARIA

You can still get malaria even though you are taking an antimalarial drug and using protection against mosquito bites. Taking an antimalarial drug greatly reduces your chances of getting malaria. But no antimalarial drug is 100% effective. You should be alert for the flu-like symptoms of malaria. Symptoms can include:

- Fever.
- Shaking chills.
- Headache.
- Muscle aches.
- Tiredness.
- Nausea.
- Vomiting.
- Diarrhea.

Malaria symptoms will happen at least 7 to 30 days after being bitten by an infected mosquito. So fever in the first week of travel in a malaria-risk area is unlikely to be malaria. But ill travelers should still get medical care right away. Any fever should be promptly checked out.

If you become ill with a fever or flu-like illness while traveling in a malaria-risk area and up to 1 year after returning home, get medical care right away. Delaying treatment can lead to serious complications such as:

- Loss of your pregnancy (*miscarriage*).
- Coma.
- Kidney failure.
- Death.

Tell your caregiver where you have been traveling and that you have been exposed to malaria.

SELF-TREATMENT

- Malaria can be a fatal disease if not treated quickly.
- Travelers who will be more than 24 hours away from professional medical care during their trip should ask their caregiver about a self-treatment drug. If you develop fever or other flu-like illness, and professional medical care is not available within 24 hours, take your self-treatment drug. Get medical care right away after self-treatment.
- If the recommended antimalarial drug cannot be taken, pregnant women and their caregivers should contact the Centers for Disease Control Malaria Hotline at 770-488-7788 for advice on alternative drugs and a self-treatment regimen, if needed. **Pregnant women should not travel to a malaria-risk area without appropriate antimalarial drug therapy.**

TAKE YOUR ANTIMALARIAL DRUG WHILE BREAST-FEEDING

- If you are breast-feeding, a very small amount of chloroquine or mefloquine will be passed into your breast milk. This small amount of drug will not harm your infant. But it will not be enough drug to protect him or her against malaria. Children taken to a malaria-risk area should have their own antimalarial drug.
- Women who are breastfeeding infants weighing less than 11 kg (25 pounds) should not take Malarone™ as their antimalarial drug. Primaquine should not be given to a breastfeeding woman unless both she and her infant have a documented normal G6PD level. Very limited data on doxycycline indicates that it is probably safe to use during breast-feeding and the chance of a problem developing is remote.
- Children of any age can get malaria. Infants traveling to an area with malaria risk need to be given their own antimalarial. See your child's caregiver 4 to 6 weeks ahead of travel. This will allow time for vaccinations to take effect and malaria drug doses to be made by a pharmacist.

LENGTH OF ILLNESS

- The illness may last 7 to 14 days after treatment is started.
- The incubation period is 7 to 30 days following a bite from an infected mosquito.
- Relapses of malaria from the P. vivax and P. ovale strain may happen months or years after the first attack.

PREVENT INSECT BITES

- Malaria is transmitted by the bite of an infected mosquito. These mosquitoes usually bite between dusk and dawn. To avoid being bitten, remain indoors in a screened or air-conditioned area during the peak biting period. If out-of-doors, wear long-sleeved shirts, long pants, and hats. Apply insect repellent to exposed skin.
- Use insect repellents that contain DEET (diethylmethyltoluamide) for the best protection against mosquitoes and other biting insects.
- Follow these precautions when using repellents with DEET:

- Read and follow the directions and precautions on the product label.
- Pregnant women should use insect repellents containing DEET, as recommended for other adults. But use it sparingly. Wash repellent off with soap and water after coming indoors.
- Use only when outdoors.
- Do not breathe in, swallow, or get into the eyes. (DEET is toxic if swallowed.) If using a spray product, apply DEET to your face by spraying your hands and rubbing the product carefully over the face. Avoid the eyes and mouth.
- Do not apply DEET on wounds or broken skin.
- Higher concentrations of DEET may have a longer repellent effect. But concentrations over 50% provide no added protection.
- Timed-release DEET products may have a longer repellent effect than liquid products.
- DEET may be used on adults, children, and infants older than 2 months of age. Protect infants by using a carrier draped with mosquito netting. It should have an elastic edge for a tight fit.
- Children under 10 years old should not apply insect repellent themselves. Do not apply to young children's hands or around eyes and mouth.

➢ Travelers should also take a flying-insect spray on their trip. This will help clear rooms of mosquitoes. The product should contain a pyrethroid insecticide. These insecticides quickly kill flying insects, including mosquitoes.

➢ If you are not staying in well-screened or air-conditioned rooms, you should take additional precautions, including sleeping under mosquito nets. Bed nets sprayed with the insecticide permethrin are more effective. It both repels and kills mosquitoes. In the United States, permethrin is available as a spray or liquid (e.g. Permanone™) to treat clothes and bed nets. Overseas, bed nets may be bought that have already been treated with permethrin. Permethrin or another insecticide, deltamethrin, may be bought overseas to treat bed nets and clothes.

HOME CARE INSTRUCTIONS

➢ Call your caregiver if you develop any of the symptoms mentioned above.

➢ **Do not** travel to malaria risk places unless it is necessary.

➢ Follow your caregiver's instruction and advice regarding your treatment and follow-up appointments.

➢ Follow the instructions and advice on how to prevent malaria if you go to a malaria risk place.

➢ Call the CDC for more information regarding malaria.

Information courtesy of the CDC.
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