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PREGNANCY, PREGNANCY WISH AND BREAST-FEEDING

Travelling has become so common that few women postpone a trip because of pregnancy. More and more young couples, planning to get pregnant quickly organise an exotic trip, because they don't have to worry about their first child. Nevertheless, several health risks exist during pregnancy and should be taken into consideration:

A. Pregnancy related health problems:

- The chance of getting a **medical problem** is greater for a pregnant woman and cannot always be foreseen. One should be informed about the quality of the medical infrastructure in the country of destination before departure.
- The risk of **infections** is higher when travelling. Infections are sometimes more difficult to treat due to the potential harmful effect of certain medicines on the embryo. In addition, any infection which is accompanied by high body temperature can trigger early labour.
- Because usually we're talking about a tourist trip, one should always reflect on the possible risks, bearing in mind that choosing a different travel destination or postponing the trip is always a possibility.

As the risk of spontaneous miscarriage is greatest during the **first three months**, it is better to postpone a long journey until after this period. Travelling while pregnant does not increase the risk of miscarriage, but coping with possibly severe haemorrhage can cause problems, especially in remote areas. The combination of both morning sickness and motion sickness increases the risk of intense vomiting resulting in dehydration, especially in tropical circumstances.

During **the third trimester** one should be alert for haemorrhages (e.g. placenta praevia), pregnancy toxaemia ("pre-eclampsia") (high blood pressure, protein in the urine, swollen feet) and premature rupture of the membranes. Moreover, travelling during the last three months of pregnancy is physically more difficult and uncomfortable. From 32 weeks a pregnant woman is no longer allowed to take an intercontinental flight, and after 36 weeks a pregnant woman is no longer allowed to take any flight at all. One has to wait 7 days after giving birth before flying again (risk of blood clots with the mother) and the child must be at least 7 days old. The woman should carry a doctor's certificate specifying the expected date of delivery.

The ideal period for travel is approximately **between 16 and 28 weeks**: the first pregnancy checks have been carried out, the period of morning sickness / nausea has passed, there is less chance of miscarriage and the risk of premature labour is still somewhat distant.

Pregnant women **are discouraged** from travelling to remote areas, to regions where yellow fever is endemic (if not vaccinated) and to areas where resistant malaria is prevalent, with a high transmission risk (zone C =).

B. Pregnancy and travel related health problems:

Pregnant women have a greater risk to be infected with **malaria** and to develop complicated malaria. For this reason pregnant women are advised not to travel to regions with moderate to high malaria risk.

Because vaccination against yellow fever is in theory not routinely given to pregnant women, pregnant women are advised not to travel to **regions with yellow fever** if they have not been vaccinated before (see further).

All routine pregnancy examinations must be carried out before departure. For compulsory vaccinations and malaria prophylaxis we refer travellers to the following brochures in which the essential points are summarised.

The emphasis lies on **prevention** of illnesses such as diarrhoea, worm infestations, skin infections, and of course also rubella, toxoplasmosis, etc. The advice of a specialist may also be obtained if there is any doubt about possible contraindications for medications.

1. VACCINATIONS

In general, one tries to avoid the administration of a live attenuated vaccine during pregnancy. For some vaccines, pregnancy forms a strict contra-indication (measles-mumps-rubella-varicella), but for the yellow fever vaccine this is a "precaution". The recommendation is to avoid becoming pregnant for 1 month after vaccination with these vaccines. Live vaccines are generally not administered whilst breastfeeding, unless there are high-risk circumstances.

Inactivated vaccines can be administered without any objection if they are indicated during the pregnancy and whilst breastfeeding.

1. The **vaccine against yellow fever** is not given routinely to pregnant women, but in cases where there is a realistic chance of infection the vaccine can be administered throughout the pregnancy. No problems have ever been reported after accidental vaccination, so there is normally no cause for alarm. It is safe to become pregnant one month after vaccination. **Breastfeeding** (babies younger than 6 months) is a relative contra-indication, because (benign) meningo-encephalitis has rarely been reported in infants.

2. **Tetanus vaccination** must be up to date. Pregnant and breastfeeding women may be vaccinated with the different combined vaccines when indicated Tektivax Pro Adulto[®] (the combined **tetanus/diphtheria** vaccine), Revaxis[®], (the combined **tetanus/diphtheria/polio** vaccine), Boostrix[®] or Boostrix-Polio[®] (the combined **tetanus/diphtheria/pertussis vaccine, with or without polio**), preferably during the second or third trimester of the pregnancy.

Boostrix[®], the combined **tetanus/diphtheria/acellular pertussis vaccine** has been systematically recommended in Belgium since 2013 for every pregnancy between 24 and 32 weeks gestations, regardless of whether the woman has previously received a booster vaccination.

3. Pregnant women should be protected against **poliomyelitis**; the booster inoculation should be with an inactivated vaccine (single vaccine after the complete vaccination and if the previous vaccination was given more than 10 years ago). Breast-feeding is no contra-indication. The oral polio vaccine is no longer available in Belgium, but is still used in the tropics; it is not given to pregnant women.

4. Vaccination is recommended to women who have no immunity to **hepatitis A**. Gamma globulins are no longer available. Vaccination provides complete and long-lasting (lifelong) protection and may be administered from the second trimester of pregnancy. Breast-feeding is no contra-indication.

NB **Hepatitis E** is a viral liver infection which looks very similar to hepatitis A. The virus is probably transmitted by faecal contaminated water. The disease almost always runs its course without problem, but in pregnant women it can be serious, with a significant risk of fatal outcome. **Hepatitis E** probably exists in all developing countries but has mainly been observed in Africa, Asia, the Middle East and Mexico. There is no vaccine, but fortunately the infection is rare amongst travellers.

Hepatitis E can be prevented by good hygiene measures concerning beverages and food.

5. Due to a lack of sufficient data, the relative risks to pregnant women of the oral and of the injectable **typhoid vaccine** are not known. The live oral vaccine is therefore not administered to pregnant women. The inactivated vaccine may be administered. Breast-feeding is no contra-indication, both vaccines may be administered.

6. **Hepatitis B vaccine** may be administered to pregnant women. Because of the fact that pregnant women are more at risk of being hospitalized when traveling for longer periods, and because of the possible consequences of infections on the unborn child, vaccination is recommended. Breast-feeding is no contra-indication.

7. The tetravalent **meningococcal meningitis** vaccine (the capsular polysaccharide vaccine, which is unavailable at the moment, as well as the conjugate polysaccharide vaccine) may be administered to pregnant women when there is a high risk. Breast-feeding is no contra-indication.

8. **Rabies vaccine** may be administered. Breast-feeding is no contra-indication.

9. **Measles, mumps and rubella and varicella vaccine** is contraindicated during pregnancy. Breast-feeding is no contra-indication.

10. Vaccination against **Frühsummer Meningo-Encephalitis** and **Japanese Encephalitis** may be administered to pregnant women when there is a high risk of infection. Breast-feeding is no contra-indication.

There are no specific data on the safety of vaccines against Frühsummer encephalitis and Japanese encephalitis in pregnant women and breastfeeding women, and hence these vaccines should not be

routinely administered. However, if a pregnant/breastfeeding woman cannot avoid travelling to a highly endemic area, she should certainly be vaccinated because of the great risk of infection for mother and child.

11. **BCG**: not routinely administered to pregnant/breastfeeding women.

2. MALARIA

- If a pregnant woman has to spend time in an area with elevated risk of malaria, then maximum prevention is indicated due to the potentially harmful effects of malaria for the mother and the unborn child (and the risk of severe malaria is also higher for the newborn).
- Prevention firstly entails the “protective measures against mosquito bites” (read the relevant paragraphs in the malaria leaflet thoroughly), but preventative chemoprophylaxis can also be indicated.

A. MALARIA PREVENTION

1. Repellents

Pregnant women attract significantly more malaria mosquitoes than non-pregnant women.

- **DEET**: The use of DEET-containing repellents for a limited period is not a problem, as no side effects during pregnancy have been reported (but the effects of long-term use are not known). The recommendation is to use DEET at a concentration of 20% to no more than 30%.
- **IR3535** and **(p)icaridin** can be used during pregnancy. In order to limit contact with the product as much as possible, it is recommended that you rinse any remaining product from the skin when protection is no longer required (for example, at home in the evening).
- Products based on the **citrodiol extract of eucalyptus oil** (cis and trans p-methane 3,8 diol) may **not be used during pregnancy**.

In order to limit contact with the product as much as possible, it is recommended that you rinse any remaining product from the skin when protection is no longer required (for example, at home in the evening).

2. Chemoprophylaxis

- **Mefloquine (Lariam®)** may be used throughout the pregnancy and whilst breastfeeding, even in the case of infants weighing less than 5 kg. One should always consult a doctor about this.
- **Atovaquone/Proguanil/Malarone®**: use is permitted during pregnancy and whilst breastfeeding, even if the child weighs less than 5 kg, provided that there is a compelling reason for chemoprophylaxis. However, the Belgian package leaflet states that it can be used during pregnancy if the benefits outweigh the theoretical risk to the foetus, but that it is not recommended whilst breastfeeding (for children weighing less than 5 kg). The guidelines about use of this product for pregnant women and women who are breastfeeding varies from one country to the next. We have adopted the guidelines used in Great Britain (www.gov.uk/phe - “Guidelines for malaria prevention in travellers from the UK 2013”) and France (www.lecrat.org), which state that Atovaquone/Proguanil – Malarone can be used throughout the pregnancy and whilst breastfeeding. The CDC discourages use in pregnant and breastfeeding women and the WHO states that there are insufficient data, but does not discourage use (WHO update 2015).

- **Doxycycline: may be used during the first trimester of the pregnancy** if there are compelling reasons for chemoprophylaxis. Potential side effects are yellow discolouration of the baby teeth, but these are only formed in later stages of the pregnancy. However, officially the Belgian package leaflet states that use during pregnancy (and in children younger than 8 years) is not recommended. There is disagreement internationally: in Scandinavia and according to the French guidelines (www.lecrat.org), doxycycline can be used during the first trimester of the pregnancy and in Great Britain (www.gov.uk/phe - "Guidelines for malaria prevention in travellers from the UK 2013") up to the 14th week of pregnancy, if there is a compelling reason for chemoprophylaxis and no alternative is available (one must remember that one has to be able to continue taking doxycycline for another 4 weeks after returning from the malaria area). The WHO also discourages use. **Breastfeeding:** in general this is a contra-indication, but according to the guidelines in Great Britain (www.gov.uk/phe - "Guidelines for malaria prevention in travellers from the UK 2013") doxycycline can be used whilst breastfeeding, if there is a compelling reason for chemoprophylaxis and no alternative is available. The American Academy of Pediatrics in the United States agrees that the intake of doxycycline is compatible with breastfeeding, because only very small quantities are secreted in the breast milk.

According to convincing data from Scandinavia (& www.lecrat.org), there is no cause for concern following accidental intake of doxycycline during conception or at the start of the pregnancy and there is no reason to consider termination of the pregnancy.

- **Chloroquine:** may be used during pregnancy and breastfeeding.

B. MALARIA TREATMENT

- **Quinine**

- Either with quinine alone: 3x 500 mg per day for seven days (for ten days in case of travel to the Far East) (permitted throughout the entire pregnancy).
- Or quinine for five days, in combination with clindamycin (3x 600 mg per day, for five days; permitted throughout the pregnancy) or with Fansidar[®] (Fansidar[®] is no longer available in Belgium since the end of 1997, but is still available in Africa; may only be used **during the second trimester of pregnancy and the first half of the third trimester**). Quinine can sometimes cause uterine contractions, but it can only trigger labour at the end of the pregnancy. On the other hand, the fever caused by malaria also increases the risk of miscarriage or premature birth.

- **Artemether/lumefantrine (Riamet[®])** may be used during pregnancy, from the second trimester. According to the SmPC (Summary of Product Characteristics, www.fagg-afmps.be) and the WHO, use during the first trimester of pregnancy is only permitted if no other suitable and effective malaria treatments are available. **Dihydroartemisinin/piperaquine (Eurartesim[®])** may be used from the second trimester of pregnancy, according to the WHO and a recent study in NEJM (March 2016). Use during the first trimester of pregnancy is only permitted if there are no alternatives. The Belgian SmPC discourages the use throughout the entire pregnancy.

- **Doxycycline and Atovaquone-Proguanil/Malarone[®]** are not used, as a general rule.

- **Lariam[®]** may be used as a treatment throughout the entire pregnancy, but is hardly ever used anymore in practice for this indication due to the unpleasant side effects.

If indicated, each of these malaria medications – except for Doxycycline – may also be used during breastfeeding.

3. ZIKA FEVER AND PREGNANCY

Zika virus is a flavivirus primarily transmitted from human to human through bites of the *Aedes* mosquito that bites during daytime. In most people the zika infection occurs asymptotically, in others it can cause a flu-like syndrome, comparable to dengue or chikungunya.

Since the end of 2015 there is a zika outbreak in South-America, Central America and the Caribbean. Zika is also present in the United states of America (Florida and Texas), some countries in South-east Asia and Africa and the islands in the Pacific Ocean. The disease can also be transmitted during pregnancy to the unborn child and can cause anomalies such as growth retardation, eye disorder, hearing disorders, neurological disorders like microcephaly (too small skull), psychomotor retardation, arthrogryposis (joint disorders) and might even lead to a miscarriage.

For pregnant women and women wanting to become pregnant during the journey or immediately afterwards it is recommended not to travel to a country with Zika virus. Zika virus can also be transmitted through sexual contact and through blood transfusion.

There is no vaccine nor treatment available. The only possible prevention is mosquito bite prevention during daytime.

Pregnant women and women with a pregnancy wish and their male sexual partner who have traveled to a region where Zika virus is circulating can be tested. If there have been symptoms, the test should be performed as quickly as possible. If there have been no complaints, the best moment to perform a test is 3 weeks after return.

It is recommended that male partners from pregnant women use condoms or abstain from sexual intercourse while awaiting a consultation in a specialized clinic. This advice is altered if or when new information becomes available. Please consult our website regularly: www.travelhealth.be.

ECDC zika map: http://ecdc.europa.eu/en/healthtopics/zika_virus_infection/zika-outbreak/Pages/Zika-countries-with-transmission.aspx (pregnant women should avoid travelling to red and orange areas).

More information about the precautions against mosquito bites can be found at: <http://www.reisgeneeskunde.be/itg/Uploads/MedServ/EMAATREGELLEN.pdf>

4. MISCELLANEOUS

- A pregnant woman should enquire before departure to what extent the travel insurance covers medical problems due to pregnancy.
- In order to prevent blood clots in the blood (the risk of deep vein thrombosis) during long journeys by air: drink large amounts of fluids, wear loose clothing, comfortable shoes or slippers, regularly stretch the legs and take frequent walks around in the aircraft. One should go to the toilet regularly when drinking abundantly.

One should be careful when walking around in the aircraft, the risk of falling is greater because it is difficult to keep one's balance in an airplane (changed centre of gravity and relatively decreased coordination in case of rapid change of position).

- The travel pharmacy should to be discussed with the doctor.
 - Paracetamol may be taken as a painkiller and antipyretic.
 - Treatment for **vaginal fungous infection or cystitis** may also be taken.
 - Disinfection of drinking-water: the use of chlorine drops is no problem, but prolonged use (more than 3 weeks) of iodine drops is not advised.
 - Traveller's diarrhoea: prevention is vital but the use of preventive medication should be avoided. As treatment, rehydration is essential (oral salt-sugar solution – type ORS) is an essential part of the travel medicine kit).

Loperamide (like Imodium®) in moderate dose is regarded as relatively safe, but should only be used for excessive watery diarrhoea. Loperamide is contraindicated when breast-feeding, even when the fraction that can be found in the mother's milk is small. **Azithromycin** (Zitromax 500 mg per day for 1-3 days) can be used (as short as possible) by pregnant and breast-feeding women for **severe** traveller's diarrhoea. Quinolones are contraindicated. Aminopenicillins and erythromycin are safe in an emergency during pregnancy. Bactrim® and Eusaprim® may be used in the second trimester of pregnancy, although their efficacy is often insufficient.
 - Amoebic dysentery is a potentially life-threatening disease and can be treated with metronidazole (to be avoided in the first three months of pregnancy) and paromomycin.
- Journeys to mountainous regions are probably safe up to 2500m. If going to higher altitudes (max. 4000 m), physical exertion should in any case be avoided and an adequate fluid intake is absolutely necessary. Diamox will not be given to pregnant or breast-feeding women, but is not absolutely forbidden.
- When residing in the tropics, it is strongly recommended to plan the delivery in a place where “safe blood transfusion”-practices are ongoing, in case complications should occur.