



THE INTERNATIONAL MOUNTAINEERING AND CLIMBING FEDERATION
UNION INTERNATIONALE DES ASSOCIATIONS D'ALPINISME

Office: Monbijoustrasse 61 • Postfach
CH-3000 Berne 23 • SWITZERLAND
tel.: +41 (0)31 3701828 • fax: +41 (0)31 3701838
e-mail: office@uiaa.ch

GUIDELINES FOR WOMEN GOING TO ALTITUDE

Dr Dominique JEAN, MedCom UIAA

- First version: September 2003 (written by D.Jean, presented by C.Leal at Copenhagen meeting).
- Presented by D. Jean at Teheran meeting: September 2004.
- Published as consensus paper with co-authors: Jean D., Leal C., Kriemler S., Meijer H., Moore LG. Medical recommendations for women going to altitude. A medical commission UIAA consensus paper. High Alt. Med. Biol. 2005; 6: 22-31.
- This short paper for UIAA website: last corrections May 2006.

NON PREGNANT WOMEN

AMS

- There is no difference between men and women in the incidence of AMS.
- The incidence of HAPE is lower in women than in men.
- The incidence of peripheral edema is higher in women than in men.
- There is no reported difference between men and women in the incidence of HACE.
- Although progesterone increases hypoxic ventilatory response at sea level, there is no proved difference between menstrual cycle phases for acclimatization to high altitude (HA).

Menses

- Menstrual cycle can be modified by HA: abolished, longer, shorter, irregular...in combination with other factors probably more important than altitude: jet lag, exercise, cold, weight loss...

Contraception

- There is no proved advantage or disadvantage for altitude acclimatization with oral contraceptives.
- The theoretical risk of oral contraceptives (except for progesterone alone) is thrombosis during long stays at HA, in combination with polycythemia, dehydration and cold. Actually very few accidents have been reported. The risk is lower with the second-generation OCPs (versus first- or third-generation), which are recommended as a first choice at HA, but with these low-dosage pills 2 risks should be known:
 - o It may be difficult to respect the exact time of administration in expedition, compromising contraceptive efficiency.
 - o The efficiency may also be compromised during and 7 days after the use of some antibiotics, especially broad-spectrum penicillins and tetracyclines.
- To avoid or significantly reduce bleeding, OCPs or progesterone (pills or medroxyprogesterone injections) can be taken continuously for several months (but spotting may occur during the first 3 months).

Iron

- Latent iron deficiency can impede acclimatization at very high altitudes. Ferritin dosage can be useful before expedition for supplementation if indicated.

PREGNANT WOMEN

Risk of traveling in remote and exotic countries

- To be far from medical/obstetrical assistance if needed.
- Infectious diseases can be more severe during pregnancy: especially diarrhea, malaria, hepatitis E.
- Some drugs useful for prophylaxis or treatment are contra-indicated during pregnancy: most antimalarials, quinolones, sulfonamides...

Risk of hypoxia

Most studies concern women living permanently at HA. For pregnant women living normally at low altitude, very few studies have been made during acute exposure (hours) at moderate altitude, with or without exercise, and there is no study on prolonged exposure (days to weeks). So most of the recommendations can only be based on extrapolations.

Physiological responses to altitude exposure:

Immediate increase of maternal ventilation and cardiac output (with increase of uterine artery and

placental blood flow) preserves, at best, oxygen delivery to the fetus.

- AMS incidence is not different during pregnancy. The use of acetazolamide is contra-indicated during the first trimester (risk of teratogenicity) and after 36 weeks of pregnancy (risk of severe neonatal jaundice).

- Adequate hydration is recommended because of hyperventilation (altitude + pregnancy) in a usually dry environment at altitude.

- First half of pregnancy: the risk of altitude exposure is low. Higher incidence of spontaneous abortion in the first trimester is suspected but not proved.

Recommendation: avoid high altitude for women with difficulties to become pregnant and/or higher risk of spontaneous abortion.

- Second half of pregnancy: potential high risk for mother and fetus, depending on individual factors, altitude level and exercise.

- Short stays without exercise (a few hours to a few days): very low risk for healthy pregnancy up to 2500 m. No data above.

Altitude is not recommended for women with risk factors (see below), even for short stays.

- Long stays without exercise (weeks to months), above 2500 m:

Mother: higher incidence of hypertension, preeclampsia, placental abruption.

Fetus: intra-uterine growth retardation during 3rd trimester and low birth weight.

Recommendation: attentive clinical and echo-doppler supervision after 20 weeks of pregnancy.

- Exercise: competition for blood supply between skeletal muscles and placenta.

Risk of fetal hypoxia or preterm labor.

Recommendations:

Allow 3-4 days acclimatization before exercise above 2500 m.

Wait for full acclimatization (2 weeks) before strenuous exercise and avoid heavy exertion at higher altitudes.

Contra-indications to altitude in pregnancy (after 20 weeks):

- Chronic or pregnancy-induced hypertension.

- Impaired placental function (ultrasound diagnosis).

- Intra-uterine growth retardation.

- Maternal heart or lung disease.

- Anaemia.

- Smoking combined with exercise is a high risk factor and could be a contra-indication.

Risk of trauma

Beware of changes in centre of gravity and joint laxity during pregnancy, predisposing to falls and trauma, with potential risk of placental disruption (ski).