

Diving during pregnancy/whilst breastfeeding

Pregnancy and Diving

The topic of 'diving during pregnancy' has been the subject of intense debate in diving and hyperbaric medicine for decades. Whilst detailed recommendations on fitness to dive are available for many pre-existing internal or cardiopulmonary conditions, the evidence regarding diving during pregnancy is extremely limited. Prospective, controlled studies do not exist for obvious ethical reasons. The available evidence is therefore based on retrospective surveys, observational studies and case reports. Nevertheless, epidemiological analyses, data from animal experiments and pathophysiological considerations allow for a clear risk assessment.

Current research

Observations of pregnant divers show that the rate of miscarriages and birth defects may be higher, particularly during deep and prolonged dives. Retrospective surveys point to an increased incidence of premature births and miscarriages, although the results are sometimes contradictory.

The Japanese Ama, traditional free-diving pearl divers, have attracted particular attention. No increased rate of birth defects was found in this population, though the newborns had a significantly lower



birth weight. This observation suggests subtle but significant effects of repeated dives on foetal growth.

Individual analyses suggest that dives to depths of up to around 20 metres have no clearly discernible negative effects on pregnancy. However, given the small sample sizes, the retrospective designs and the multitude of potential confounding factors, the validity of these studies remains limited. In summary, it can be stated that there is no robust evidence to prove that diving during pregnancy is safe.

Pathophysiological considerations

The risks to the unborn child arise from several factors:

Maternal gas exchange changes: During diving, fluctuations in the partial pressures of oxygen and carbon dioxide may occur. The foetus is particularly sensitive to hypoxia (oxygen deprivation), as its oxygen supply is already at the lower limit under physiological conditions.

Bubble formation in the foetal circulation: As the foetus has physiological right-to-left shunts (including the foramen ovale), microbubbles can enter the systemic circulation unfiltered and potentially trigger embolic events.

Mechanical and haemodynamic stresses: Cold, increased respiratory effort and peripheral vasoconstriction can reduce uteroplacental blood flow. This carries the risk of reduced oxygen supply to the foetus.

Decompression physiology: The foetus is not integrated into the mother's decompression process. The foetal circulation lacks a 'lung filter' for microbubbles. Even if the mother does not develop clinical decompression sickness, microbubbles or hypoxic damage may occur in the foetus.

These considerations highlight that even uneventful dives conducted in accordance with regulations may pose a significant risk, as the foetal circulatory system is particularly susceptible to gas bubbles.

Recommendations from international professional bodies

All major diving medicine societies issue a clear recommendation based on the limited data available:

- The GTÜM recommends avoiding all dives during pregnancy.
- The UHMS and the EUBS classify pregnancy as an absolute contraindication for recreational diving.
- The SPUMS also points out that, even if you are planning to have a baby, it is advisable to refrain from diving as a precautionary measure to prevent diving during an undetected early pregnancy.

There is consensus that accidental diving during the first few weeks of pregnancy does not constitute grounds for termination of pregnancy. Instead, close gynaecological monitoring should be carried out.

Breastfeeding and Diving

Once the baby has been born and any birth-related injuries have fully healed, it is safe to resume diving. It is also advisable to wait until the postpartum bleeding has completely stopped.

In principle, diving is possible whilst breastfeeding, but it is advisable to ensure that the breastfeeding mother maintains adequate fluid intake, as both breastfeeding and diving are associated with increased fluid loss and a significant additional need for fluids in breastfeeding women.

This fluid deficit should be adequately compensated for, as otherwise milk production is impaired, physical performance is reduced and the risk of suffering a decompression injury (DCI) increases significantly.

Occasionally, diving may lead to a decrease in milk production.

If, whilst breastfeeding, the nipples become sore or inflamed, or if mastitis (inflammation of the mammary glands) develops, diving is prohibited until complete healing has taken place.