

## **Birth in Water**

### **RCOG Statement No. 1**

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#### **1. Introduction and background**

Lying in warm water for relaxation and pain relief during early labour has been widespread in clinical practice for many decades, but usually for relatively short periods and during early labour. Then, during the 1980s it became increasingly popular to give birth in water using specially designed pools and to use more prolonged immersion in water throughout labour.

Those advocating labour and/or birth in water argue that buoyancy in water helps women to relax and the warmth may help to reduce pain. For women using birthing pools rather than conventional baths there may also be greater ease of movement. It is also argued that use of a birthing pool offers greater privacy and a more holistic experience. A systematic review comparing labour in water with conventional labour (988 women) found no clear differences in either benefits or adverse effects between the two options.<sup>1</sup> In this review all the women left the water for the birth.

In recent times, birth in water was first popularised by Odent.<sup>2</sup> In 1990, the Scientific Advisory Committee produced a statement on birth under water, emphasising the need for scientific study. This statement was revised in 1994, following a period of intense media interest in the safety of labour and birth in water. The need for appropriate information about the benefits and risks of birth in water and its level of use throughout the country was again highlighted. Some of this information is now available and it is timely to review the evidence surrounding birth in water in the UK. This paper updates the 1994 RCOG statement and briefly summarises the most relevant evidence and issues. It does not aim to be either a comprehensive or a systematic review of birth in water.

#### **2. Search strategy and assessment of evidence**

The Cochrane Library and the Cochrane Register of Controlled Trials were searched for relevant randomised trials and systematic reviews. Medline, Embase and Cinhal were also searched for relevant papers.

#### **3. Birth in water in the UK**

There are few data on frequency and outcome following labour or birth in water. A survey of NHS maternity units in England and Wales during 1994-96 reported that 0.6% of deliveries occurred in water during that time, a total of 4029 births. Of these, 9% (380 of 4029) delivered at home.<sup>3</sup>

A recent national surveillance study provides some data on perinatal morbidity and mortality for babies delivered in water. Babies were included in the study if they died or were admitted to special care within 48 hours of birth and were delivered either in water or following labour in water from April 1994 to April 1996.<sup>3</sup> Of the 96 reports, 64 fulfilled

the case definition; 37 of the 64 reports followed delivery in water and 27 involved labour in water with delivery outside the pool.

There were five perinatal deaths among the 4029 babies born in water in England and Wales, giving a perinatal mortality of 1.2 per 1000 live births (95% CI 0.4-2.9). This compares with a perinatal mortality of 1.4 (95% CI 0.7-2.3) for a comparable group of low-risk primiparous women having a conventional birth (relative risk 0.9; 95% CI 0.2-3.6). Thirty-four babies required admission to special care, giving a risk of 8.4 per 1000 live births (95% CI 5.8-11.8). This compares with a risk of 37 per 1000 live births (95% CI 33-41) for a comparable group of low-risk primiparous women having a conventional birth and a risk of 9.2 per 1000 live births (95% CI 1.1-33.0) of requiring specialist care for GP-managed home births.<sup>3</sup> There are no routine records of the number of women who use prolonged immersion in water during labour but leave the pool for delivery. Anecdotally, this is likely to be a far more common practice than birth in water.

#### **4. Strategies which may increase safety and women's satisfaction following birth in water**

Labour and birth in water are usually offered to women with an uncomplicated pregnancy at term. Women with a variety of complications, including previous caesarean section, have also used birthing pools for labour and delivery without reported problems.<sup>4</sup> There is little evidence to guide women with high-risk pregnancies in their decision about whether to use immersion in water. Immersion in water during the first stage of labour is less controversial than immersion either during the second or third stage. All women who labour or give birth in water should have appropriately skilled attendants.

Several small trials have compared immersion during labour with no immersion but no trials have compared the effects of being born in water with conventional birth.<sup>1</sup> Many of the issues listed here are therefore theoretical and further research is required to reliably determine the real effects of labour and birth in water and to guide clinical practice.

##### **Careful control of the water temperature**

The hypothesis is that warm water reterine perfusion, relaxation and contraction, thus leading to less painful contractions and shorter labours. Temperature of the water should be comfortable for the woman, although body temperature (37°C) may be the ideal. Water temperature should not rise above 37°C, however, as there is a risk of circulatory redistribution to the skin and hypotension, possibly leading to decreased placental perfusion.

Also, sweating would increase, with a risk of maternal dehydration during a long immersion. Women should be encouraged to drink to prevent dehydration. For the 64 babies identified in the surveillance study, no information about temperature was given for 26 of them (41%).<sup>3</sup>

Temperature of the water needs to be carefully controlled and should be regularly measured and recorded.

##### **Keep the pool clean**

During normal delivery the pool may become contaminated by amniotic fluid, blood or faeces. This could lead to an increased risk of neonatal and/or postpartum infection, as well as possibly increasing the risk to staff attending the woman. There has also been concern about possible contamination with pseudomonas leading to clinical infection.<sup>5,6</sup> There has been theoretical concern about blood-borne viruses but there is no evidence that this is a problem in practice. In the surveillance study, only three babies were reported to have evidence of infection and one of these was neonatal herpes, which is unlikely to be related to immersion in water.

Although the risk of serious infection appears to be low, minimising contamination of the water by strict adherence to procedures for cleaning pools should help minimise any risk.

### **Avoid prolonged immersion**

One trial (200 women) compared a policy of entering the bath before 5 cm cervical dilatation with a policy of entering the bath after 5 cm dilatation.<sup>7</sup> Women who entered the bath early had longer labours and required more oxytocin. They were also more likely to have epidural analgesia.

This information should be presented to women, so that they can be encouraged to wait until 5 cm cervical dilatation before entering the bath.

### **Minimise the risk of snapping of the umbilical cord**

An unexpected finding in the surveillance study was that five of the 37 babies (14%) born under water and admitted to special care had a snapped umbilical cord.<sup>3</sup> One baby required transfusion. There are no data on the risk of the cord snapping following normal delivery out of water. A suggested mechanism for the cord snapping was that bringing babies rapidly to the water surface may, if the cord is short, result in greater tension on the cord than for a conventional delivery.<sup>3</sup>

Strategies suggested for reducing the risk of the cord snapping, although none are supported by evidence, include ensuring the water is not unnecessarily deep during the second stage, bringing the baby gently to the surface and having cord clamps to hand.<sup>8</sup> Delivering the baby completely underwater before lifting to the surface has also been suggested. (Yehudi Gordon and Anita O'Neill, personal communication.)

### **Optimise the initiation of neonatal respiration**

Warmth and immersion of the baby's head in water at delivery may lead to inspiratory inhibition. A less pronounced inhibition occurs when the head is raised out of warm water or when water enters the upper respiratory tract. Conversely, cold is a strong stimulator of breathing. This suggests that exposure to cold by removing the baby from the water might optimise the breathing reflex.

### **Consider using isotonic water**

During a normal delivery, respiration usually begins as the chest is delivered. If delivery is below water the first breath may be before the face is above the surface and water may be inhaled into the lungs. However, physiological data suggest that babies are

protected from inhaling while immersed in water, unless they are asphyxiated.<sup>9</sup> Nevertheless, in the surveillance study, 2 of the 37 babies born in water were said to have inhalation of water; described as water aspiration for one and freshwater drowning for the other.<sup>3</sup> Birthing-pool water is likely to be tap water at a lower osmotic pressure than amniotic fluid. If this water is rapidly absorbed it could, in theory, lead to haemodilution and circulatory overload. To reduce this risk it has been suggested that salt could be added to the water, making it more isotonic.<sup>1,10</sup> For a birthing pool holding 909 litres of water, 9 kg of salt would give an isotonic solution.<sup>10</sup> Normal saline does not stimulate the laryngeal vagal reflex, however, so it may be more likely to be aspirated than water.<sup>9</sup> There is no evidence about the potential benefits and hazards of this practice and no data on whether salt is being used for birth in water in the UK.

### **Consider leaving the pool for the third stage**

Warmth has a relaxing effect on uterine muscles that could, theoretically, lead to increased bleeding after delivery of the placenta or possibly retained placenta. The amount of blood lost during delivery may also be difficult to estimate when diluted in the birthing pool water. Also, if the placenta is delivered under water the combination of vasodilatation and increased hydrostatic pressure could theoretically increase the risk of water embolism. Again, this is a theoretical risk and there is no evidence about whether or not it is a real concern.

Until further evidence becomes available it might be prudent to advise women to leave the pool for the third stage.

### **Have an agreed protocol for dealing with unexpected complications**

If complications develop it is usually necessary for the woman to leave the birthing pool, as it may be impossible to manage the situation in the water. It is important that women are properly informed about the possibility they may be advised to leave the birthing pool. Emergency interventions may be delayed if it is difficult to get the woman out of the bath and appropriate procedures should be developed for dealing with emergency situations. As she leaves the pool the woman should always be adequately supported to ensure she does not slip.

### **Summary**

No randomised trials have compared outcome following birth in water with outcome following conventional birth. Data from the surveillance study provide some reassurance that safety is likely to be comparable. Although only a small proportion of women give birth in water, it is likely that many more use birthing pools during labour. The use of a birthing pool for labour and/or delivery is an option that is now widely offered within maternity units in the UK and is also available for home births. Women should be provided with balanced information to enable them to make an informed choice about whether and how they use immersion in water. If they use immersion in water, they should be cared for by attendants who have appropriate experience.

### **Further reading**

The College is aware of two statements on the use of water in labour and birth to which

Fellows and Members may also wish to refer.

Royal College of Midwives' Position Paper. Use of Water in Labour and Birth. In press 2000. Burns E, Kitzinger S. Midwifery guidelines for the use of water in labour, 2000. Oxford: Oxford Centre for Healthcare Research and Development, Oxford Brookes University.

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