Waterbirth: an integrative analysis of peer-reviewed literature

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CRD summary
The authors concluded that water births appeared to be associated with minimal risk, and that the maternal and neonatal outcomes were similar to those expected in healthy childbirths. The limited evidence, and concerns about the conduct of the review, mean that its conclusions may not be reliable.

Authors' objectives
To analyse the available evidence on water births, with regards to neonatal and maternal outcomes.

Searching
CINAHL, PubMed, EMBASE, and PsycINFO were searched for relevant articles published in English. No time limits were imposed on the searches. Search terms were reported. Reference lists were checked for further relevant articles.

Study selection
The authors defined water birth as the birth of a baby entirely underwater, regardless of the location of the delivery of the placenta. Descriptive, observational, and randomised studies of water birth, published in peer-reviewed journals, were eligible for inclusion. Case reports and qualitative studies were excluded.

Most of the included studies were observational and reported on water births in hospital. Over half of the studies were conducted in the UK, and over 80% were conducted in Europe. All, but one study, reported maternal outcomes; all, but three, reported neonatal outcomes. Maternal outcomes were use of analgesia, perineal state or laceration or need for episiotomy, postpartum haemorrhage, and perception of relaxation and pain relief, among others. Neonatal outcomes were Apgar score, admission to neonatal intensive care, and death, as well as a range of complications. Study participants were not described. Most births were in hospital; three studies were in birth centres; and one study examined hospital, birth centre, and home water births.

The authors did not state how many reviewers selected studies for inclusion.

Assessment of study quality
No formal assessment of study quality was reported, but Melnyk and Fineout-Overholt's criteria were used to assess the level of evidence on a scale of one to seven; a lower score indicated better evidence. Concerns about the methods of specific studies were discussed.

Data extraction
Maternal and neonatal outcomes were extracted as they were reported in the included studies. It appears that two reviewers extracted the data and disagreements were resolved by consensus.

Methods of synthesis
A narrative synthesis summarised the findings.

Results of the review
Two randomised controlled trials (RCTs), and 36 observational studies (21 case-control and 15 descriptive) were included. There were 31,453 water births in total, ranging from 10 to 5,192 per study. The RCTs were classed as level II evidence, but both had significant shortcomings. The 21 case-control studies were classed as level IV, and the 15 descriptive reports were classed as level VI.

Maternal outcomes: Thirteen case-control studies found fewer episiotomies, and more intact perineae, after water birth, compared with conventional birth. Six case-control studies suggested more first- or second-degree lacerations, rather than severe lacerations, after water birth, than after conventional birth. One of four case-control studies reported fewer second-degree lacerations after water birth, one reported more, and two reported comparable rates. Six of seven case-control studies reported fewer third- and fourth-degree lacerations after water birth, and one reported an increase. Five
case-control studies found no difference between water birth and conventional birth, for the rate of maternal infection. One case-control study reported a significantly less prophylactic and therapeutic antibiotic use with water birth. Four of five case-control studies reported lower postpartum blood loss with water birth, and one reported no difference. Seven case-control studies reported associations between water birth and reduced analgesics. Four case-control studies reported higher satisfaction with childbirth after water birth than after conventional birth.

**Neonatal outcomes**: Two RCTs and six case-control studies found no difference in Apgar scores at five minutes; three case-control studies reported significantly higher scores for neonates born in water. There were no significant differences between water birth and conventional birth at ten minutes (three case-control studies). There were no differences in infection rates (one RCT, nine case-control studies) and admissions to neonatal intensive care (one RCT, 11 case-control studies). Based on limited evidence (four descriptive studies), neonatal death rates were low and similar after water birth and uncomplicated conventional birth. Further results on umbilical cord gases and cord avulsion were reported.

**Authors' conclusions**
The authors concluded that water births appeared to be associated with minimal risk, and the maternal and neonatal outcomes were similar to those of healthy childbirth populations.

**CRD commentary**
This review had a clear research question, and several relevant sources were searched. The inclusion criteria were vague, making it difficult to assess the appropriateness of the included studies, and reducing replicability. Relevant studies in languages other than English may have been missed. The review processes were somewhat unclear, making it difficult to assess if appropriate measures were taken to reduce reviewer error and bias.

The reporting of participant characteristics (such as baseline risk, within and between groups) was very limited, making the applicability of the findings difficult to interpret. No formal quality assessment was carried out, but the authors discussed the limitations of individual studies and their potential impact on the results. Most of the studies were not randomised, therefore a risk of bias (in selection or confounding) cannot be excluded. Only two small RCTs were included, and both had significant limitations. No justification for the choice of a narrative synthesis was provided.

Limitations in the reporting of the results make it difficult to assess whether the findings reflected the evidence. This limited evidence, and concerns about the conduct of the review, mean that its conclusions may not be reliable.

**Implications of the review for practice and research**
**Practice**: The authors recommended that health care providers should use the available evidence to discuss birth choices with childbearing women to allow them to make an informed decision.

**Research**: The authors stated that RCTs with a clear distinction between water labour and water birth, and controls for confounding variables, were needed to establish the maternal and neonatal outcomes.

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