

Pain relief in labour

Trial comparing diamorphine and pethidine*

On average diamorphine can prolong labour by nearly 1.5 hours but provides slightly better pain relief than pethidine particularly in the first hour after administration



SOURCE: NIHR PHOTO LIBRARY

NIHR INVESTIGATORS

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Why did we fund this research?

Pethidine is a drug routinely used for relieving labour pain during childbirth throughout the UK. Studies suggest, however, that it is not as effective as we would want and has a number of side effects affecting both the mother and the baby. These can include nausea, vomiting and increased anxiety in the mother and altered heart rate and breathing in the baby. Diamorphine is an alternative drug used in approximately one third of maternity units in the UK but there is not enough research comparing the benefits and side effects of the two drugs. This study set out to compare pethidine with diamorphine in terms of labour pain relief and their side effects in both mother and baby.

What did the researchers do?

They recruited participants at two sites – the Poole Hospital NHS Foundation Trust and the Royal United Hospital, Bath – where 484 women agreed to participate while attending antenatal clinics or wards or when in early labour before they requested pain relief. At the point they requested pain relief during labour, women were randomly allocated to receive either pethidine or diamorphine by injection. The two study drugs were labelled with only a reference number and distributed by the hospital pharmacy to ensure that the women, staff and research team would not know which drug had been used. The researchers measured the reduction of pain intensity for the mother at 60 minutes and over a three hour period after drug administration. For the baby they used a specific score for the health of a newborn child (the Apgar score) and also noted whether the baby needed help e.g. with breathing after birth.

Why were the drugs allocated at random?

So that the results were not influenced by the researchers, midwives or the women's own knowledge of the drug they were given, termed as bias which weakens the results if present. This double-blind (as neither the women nor those looking after them were aware) randomised controlled trial (RCT) research method was used so that the researchers could be sure that any differences in the effects of pethidine or diamorphine were due to only the drugs themselves and the results can be interpreted with confidence.

What did the researchers find?

They found that diamorphine provided slightly better pain relief for the mother than pethidine, particularly in the first hour after administration, and there was no measurable difference in the health of the baby. The researchers did note, however, that women receiving diamorphine spent an average 82 minutes longer in labour than those receiving pethidine even when other factors, such as the way the baby

was lying, were accounted for. The side effects in the mother were similar for the two drugs although more women receiving diamorphine experienced nausea and low blood oxygen during the measurement period. Generally the side effects observed in the baby were similar with both drugs except that where pethidine was used the newborn baby appeared more sedated shortly after being born.

What does this mean for women in labour and the NHS?

Women requesting drug-administered pain relief in labour have the choice of slightly better pain relief but potentially longer labour (diamorphine) or slightly less pain relief but potentially shorter labour (pethidine). As the study showed, in comparing the two drugs, although diamorphine provided slightly better pain relief than pethidine, and women seemed to be more satisfied with diamorphine, this was mainly over the first hour. Women who received diamorphine were in labour for longer (by an average of 82 minutes) so had more exposure to labour pain overall. For the NHS, using diamorphine could be more expensive because the longer period of labour may increase the costs in terms of midwifery staffing and as it costs more than pethidine.

How did public involvement impact this research?

Before the study began, the researchers had discussed a national audit on pain relief drugs used in consultant-led maternity units with midwives and women exploring their own personal experiences of pain relief in labour and had sought their views on the proposed research question for this study. Those consulted described a need for more evidence, particularly concerning the use of diamorphine since its use had increased ten-fold over a ten year period.

Once underway, two public representatives were appointed to the steering group who significantly contributed to the conduct of the study. They were particularly supportive as they believed that it had some important questions to answer so, when the researchers were having difficulties in recruiting patients, they offered ideas on how to get more women interested in participating. They also assisted with providing answers to questions from study participants during project meetings and took part in the Data and Safety Monitoring Committee to discuss any side effects patients were experiencing in the study. As a result of public involvement being key to this NIHR-funded project, the public representatives and study participants have since gone on to contribute to a focus group for obstetric research in Poole and Bournemouth to inform future studies.

*An independent research study (PB-PG-0407-13170). The main study paper can be accessed at BJOG: An International Journal of Obstetrics & Gynaecology. DOI: 10.1111/1471-0528.12532. The views expressed in the paper are those of the author(s) and not necessarily the views of the Department of Health, the NIHR or the NHS.

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