



Impact of mode of conception on neonatal and neurodevelopmental outcomes in preterm infants

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STUDY QUESTION: Is assisted conception associated with neonatal morbidity and mortality and with neurodevelopmental impairment at 2 years of corrected age in preterm infants born before 34 weeks of gestational age?

SUMMARY ANSWER: Assisted conception is not associated with an increase in neonatal morbidity and mortality and is even significantly associated with a better 2-year neurodevelopmental outcome in preterm infants.

WHAT IS KNOWN ALREADY: Assisted conception appears to increase the rate of preterm births, though few studies have analysed outcomes for these preterm infants.
STUDY DESIGN, SIZE, DURATION: This prospective observational study included 703 preterm infants born between January 2009 and December 2013 and 573 of them were assessed at 2 years of corrected age.

PARTICIPANTS/MATERIALS, SETTING, METHODS: All infants born alive between 24+0 and 33+6 weeks of gestational age and hospitalised at the Angers University Hospital were eligible as long as the mode of conception was known for neonatal outcome assessment. They were enrolled in the Loire Infant Follow-up Team (LIFT) prospective longitudinal cohort and included for neurodevelopmental outcome assessment. Neonatal morbidity and mortality were evaluated during hospitalisation based on a composite score including death, intraventricular haemorrhage Grade ≥ 3 , periventricular leukomalacia, treated patent ductus arteriosus and bronchopulmonary dysplasia at 36 weeks of gestational age. The neurodevelopmental outcome at 2 years of corrected age was determined by a physical examination, a neuropsychological test and a parental questionnaire. In order to ensure comparability, infants were matched 1:1 according to maternal age, twin status and propensity score, calculated from variables usually associated (positively or negatively) with assisted conception, including gestational age, z-score of birth weight, antenatal corticosteroids and magnesium sulphate treatments, gender, parity, maternal body mass index, tobacco consumption, outborn delivery (i.e. not at a tertiary-care medical centre) and maternal socio-economic status.

Résumé en anglais

MAIN RESULTS AND THE ROLE OF CHANCE: There were 703 preterm infants included in the analysis of neonatal morbidity and mortality, including 137 born after assisted conception. After matching, 184 preterm infants were included for neonatal morbidity and mortality analysis. There was no significant association between assisted conception and neonatal morbidity and mortality (aOR 0.67, 95% CI [0.25, 1.77], $P = 0.422$). 573 infants were assessed at 2 years, including 121 born after assisted conception. After matching, 154 preterm infants were included for neurodevelopmental outcome analysis. Assisted conception was significantly associated with a reduction in the probability of non-optimal neurological development at 2 years (aOR 0.26, 95% CI [0.09, 0.80], $P = 0.019$).

LIMITATION, REASONS FOR CAUTION: Further studies remain necessary to fully confirm these results. This was a monocentric study and 14% of enrolled infants were lost to follow up at 2 years of corrected age.

WIDER IMPLICATIONS OF THE FINDINGS: These findings are relevant for providing appropriate information to parents considering assisted conception, and more importantly for those with a preterm infant following a pregnancy achieved by assisted conception.

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