

## Adverse perinatal outcome of pregnancies after ART: twins are responsible for everything?

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**Context:** Children born after assisted reproductive techniques (ART) has been increased to 5% of in the developed countries. However, there are concerns about the perinatal outcomes of ART pregnancies and the ART children health due to bypassing the natural gamete selection and high multiple pregnancy rate.

**Objective:** To compare the obstetric outcome measures of pregnancies after ART and natural conception (NC).

**Settings:** A tertiary referral university center and county hospital

**Methods:** Retrospective analysis of computer database records of deliveries and neonates reported to the National Health Care Provider Centre from 2010 to 2015.

**Patients:** Overall, 726 deliveries and 967 newborns after ART, 28039 deliveries and 28489 newborns after NC were recorded.

**Interventions, main outcome measures:** Maternal age, previous pregnancies, gestational age at delivery, birth weight, rate of prematurity, rate of multiple deliveries, mode of delivery, admission to Neonatal Intensive Care Unit (NICU) and sex ratio were analyzed.

**Results:** Maternal age was higher in ART pregnancies ( $33.2\pm 4.1$  vs.  $28.9\pm 5.8$ ,  $p<0.05$ ), while the number of previous pregnancies lower ( $0.22\pm 0.47$ , median 0 vs.  $0.97\pm 1.37$ , median 1). Rate of multiple pregnancies was considerably higher after ART (33.2 % vs. 1.6%  $p<0.001$ ). The mean birth weight was lower after ART ( $2588\pm 1350$  grs vs.  $3207\pm 1456$  grs,  $p<0.05$ ). The mean gestational age at delivery was also lower after ART ( $36.6\pm 3.5$  weeks vs.  $38.4\pm 2.2$ ,  $p<0.05$ ), for both singleton (36.3 vs. 38.5 wks) and twin pregnancies (33.6 vs. 34.6 wks). Preterm labor rates were 9.3% for NC singletons, 38% for ART singletons, 66% for NC twins and 79% for ART twins.

Perinatal mortality increased after ART (8.3‰ vs. 1.8‰,  $p<0.001$ ), as well as NICU admissions (49.2% vs. 8.9,  $p<0.001$ ) and Caesarian rate (67% vs. 31%,  $p<0.001$ ). Sex ratio of boys over girls was 1.07 after natural conception, but reversed to 0.9 after ART.

**Conclusions:** After ART perinatal outcomes show considerably adverse trends as compared to NC, with special regard of birth weight, prematurity, perinatal mortality and NICU admission. Most women delivered with Caesarean after ART. Adverse outcome can be explained mainly with the high rate of multiples after ART, but separate differences between the singletons and twins suggest the role of other factors like maternal age and infertility related defects.

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