PERINATOLOGIC OUTCOMES OF CHILDREN BORN AS A RESULT OF IN VITRO FERTILISATION IN THE CZECH REPUBLIC DURING 2000 – 2006: CONGENITAL ANOMALIES AND BIOSOCIAL FACTORS

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Aim and type of study: Neonatal data on a cohort of 22 949 children born as a result of In Vitro Fertilisation (IVF) in the Czech Republic (CR) compared with a cohort of 649 595 naturally conceived (NC) children. Analysis of perinatal data – birth weight, gestational age, maternal age, fetal number, sex ratio and the occurrence of congenital anomalies (CA).

Material and methods: A retrospective epidemiological analysis of perinatal data from the National Registry of Births and the National Registry of Congenital Anomalies in the CR during 2000 – 2006.

Results: During this period, there were 22 949 children born as a result of IVF with a sex ratio M/F of 1.03. From this total number there were 46.88% twins and 53.12% singletons. During the same period 649 595 NC children were born, with a sex ratio M/F of 1.06. From this total number there were 96.94% singletons and 3.06% twins. In IVF/non-IVF cohort the average gestational age in weeks was 37.32/39.37; the average birth weight was 2796.72g/3321.71g and the average maternal age in years was 30.66/27.43. Prematurity in the IVF/non-IVF cohort (not distinguishing the fetal number) was 1.80%/0.27% for prematurity below the 28th week and 19.62%/3.58% for prematurity between the 28th and 35th week. A higher occurrence of prematurity below the 28th week in the IVF children cohort was found in the singleton pregnancies (1.23% in the IVF cohort vs. 0.22% in the non-IVF cohort) as well as in the twin pregnancies (2.46% in the IVF cohort vs. 1.47% in the non-IVF cohort). Extremely low birth weight ≤ 999g (ELBW) in the IVF/non-IVF cohort was found in 2.32%/0.33% of the whole cohort and Low birth weight (1000–2499g - LBW) in the IVF/non-IVF cohort was found in 27.72%/5.91% of the whole cohort. The incidence of CA was 464.06 in 10 000 live births in the IVF children cohort and 369.27 in 10 000 live births in the NC children cohort. In the IVF group, the incidence of CA per 10 000 live births was 544.06 in singletons and 362.80 in twins. In the NC children cohort, the incidence of CA per 10 000 live births was 349.95 in singletons and 425.57 in twins.
Prenatal diagnosis of CA leading to premature termination of pregnancy occurred in 115 cases in the IVF cohort (50.11 of CA in 10 000 live births) and in 3 745 cases in the non-IVF cohort (55.51 of CA in 10 000 live births). In the IVF cohort there was a higher occurrence of some CA of the central nervous system (CNS), heart, lower respiratory tract and oesophagus, selected anomalies of female and male genital organs, selected anomalies of extremities and balanced chromosomal rearrangements.

Conclusion: In the cohort of IVF children we found a significantly lower birth weight and gestational age at birth, further a higher occurrence of twins and increased maternal age. After dividing the cohort into singleton and twin groups - we found no statistically significant differences in birth weight and gestational age between the IVF and NC children. However, in the IVF cohort (in both singletons and twins) we found a significantly higher occurrence of ELBW, LBW, prematurity below the 28^{th} week and prematurity between the 28^{th} and 35^{th} week, compared to the control cohort of NC children. This difference could be caused by higher mother's age we found in the IVF cohort, what may result in higher occurrence of gestational complications. Higher occurrence of selected CA may relate to the parent's infertility itself (which is the reason for IVF), or may relate to higher maternal age and to parental genetic predisposition.

Supported by IGA MZ CR Grant # NR/9005 - 3.

PERINATOLOGIC OUTCOMES OF CHILDREN OF CHILDREN BORN AS A RESULT OF IN VITRO FERTILISATION IN THE CZECH REPUBLIC DURING 2000 – 2006: PERINATAL AND NEONATAL MORBIDITY AND MORTALITY

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Aim and type of study: Neonatal data on a cohort of 22 949 children born as a results of In Vitro Fertilisation (IVF) in the Czech Republic (CR) compared with a cohort of 649 595 naturally conceived (NC) children. Analysis of perinatal and neonatal morbidity and mortality according to birth weight, gestational age, and fetal number.

Material and methods: A retrospective epidemiological analysis of perinatal data from the National Registry of Births and the National Registry of Congenital Anomalies in CR during 2000 – 2006.

Results: During the period between 2000 and 2006, there were 22 949 children born as a result of IVF with a sex ratio M/F of 1.03. From this total number there were 46.88% twins and 53.12% singletons. During the same period 649 595 NC children were born, with a sex ratio M/F of 1.06. From this total number there were 96.94% singletons and 3.06% twins.
The incidence of stillbirths in the IVF/non-IVF cohort was 4.14‰/2.13‰ for the whole cohort, 5.13‰/2.03‰ for the singletons, 3.09‰/4.90‰ for the twins, 3.73‰/2.37‰ for the singletons with CA and 7.34‰/6.49‰ for the twins with CA. Perinatal mortality in the IVF/non-IVF cohort was 8.78‰/3.26‰ for the whole cohort, 6.82‰/2.91‰ for the children without CA, 23.44‰/12.03‰ for the children with CA, 6.67‰/3.03‰ for singletons and 11.49‰/10.24‰ for twins.
In the case of neonatal morbidity, the most frequent complications in the singletons in the IVF cohort were from the P50-P61 group according to ICD X (International Statistical Classification of Diseases and Related Health Problems 10th Revision) - (Haemorrhagic and haematological disorders). The highest perinatal mortality was found in the P90-P96 group (Other disorders originating in the perinatal period) – 89.77‰ and in the P20-P29 group (Respiratory and cardiovascular disorders) – 32.75‰. In the twins from the IVF cohort, the most frequent complications were from the P00-P04 group (Foetus and newborn affected by maternal factors) and from the P05-P08 group (Disorders related to length of gestation and foetal growth).
The highest neonatal morbidity (in both IVF and non-IVF cohort) was in children born before the 28th week of gestation; most complications were from the groups P20-P29 and P90-P96. Perinatal mortality was highest in the P10-P15 group (Birth trauma) – 285.71‰ and in the P50-P61 group (Haemorrhagic and haematological disorders) – 280.49‰. In the IVF children born between the 28th and 35th week of gestation, the highest perinatal mortality was in the P20-P29 group (Respiratory and cardiovascular disorders) – 22.64‰ and in the P35-P39 group (Infections specific to the perinatal period) – 15.30‰.

Conclusion: In the IVF children cohort we found a higher incidence of stillbirths, perinatal mortality and infant mortality, compared to the control cohort of NC children. Further, we found a higher incidence of neonatal complications in the IVF children cohort, compared to the control cohort of NC children. This is surely affected by the higher incidence of twins and prematurely born children with ELBW and LBW in the IVF children cohort, where another distribution of diagnosis could be expected – higher incidence of more severe diagnoses and therefore also higher neonatal morbidity and mortality. The higher incidence of prematurely born children with ELBW and LBW and the higher incidence of selected neonatal complications could be caused by increased maternal age in the IVF cohort and by the higher incidence of gestational complications.

Supported by IGA MZ CR Grant # NR/9005 - 3.