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Long-term follow up of the babies born from ICSI with calcium ionophore activation

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**Objective:**

Repeated fertilization failures in ICSI are rare but distressful events for patients. Therefore, oocyte activation by calcium (Ca) ionophore following ICSI has been applied to enhance fertilization. However, few follow up studies regarding children born after Ca ionophore have been reported and no statistically significant differences in fetal development at birth were indicated compared to those without artificial oocyte activation. The present study was conducted to clarify whether Ca ionophore activation affected on the babies development until 5 years old.

**Design:**

Retrospective cohort study.

**Materials & Methods:**

Development of 24 babies born from ICSI treated with Ca ionophore for repeated fertilization failures from 2004 to 2016 were investigated by sending questionnaires to their parents. Sex ratio, gestational age, congenital abnormalities at birth, birth weight and height were compared to the data of national growth survey on preschool children collected by Ministry of Health, Labor and Welfare (MHLW) of Japan. Height, weight and congenital abnormalities diagnosed at the age of 1 and a half, 2, 3 and a half and 5 were also followed up in 6 babies out of 24. Physical development including body weight and height until 5 years old was assessed by comparing to the range between the 97<sup>th</sup> and 3<sup>rd</sup> percentile curves of the national growth survey.

**Results:**

The sex ratio (f/m) was 0.6 (15 males and 9 females, respectively). Average gestational age (days) was 272.5±11.9. 21 trisomy was confirmed in one baby. Average birth height (cm) of males and females were 48.35±1.85 and 49.17 ±2.50, respectively. Average birth weight (kg) of males and females were

$2.89 \pm 0.43$  and  $2.92 \pm 0.42$ , respectively. Birth height of all babies were plotted between the 97th and 3rd percentile curves of the national growth survey. Birth weight of 20 babies were plotted between the 97th and 3rd percentile curves, but 4 babies were out. Except for one male, height and weight of all 5 babies at the age from 1 to 5 were plotted between the 97th and 3rd percentile curves. There were no significant differences in physical development between the data of babies born from ICSI with Ca ionophore and national average by MHWL. Any abnormalities were not diagnosed until 5 years old.

**Conclusions:**

The present study demonstrates that oocyte activation with Ca ionophore does not influence physical development of children. However, the safety of Ca ionophore should not be concluded from the present study due to sample size. 21 trisomy was confirmed in one baby. It is known as the result of a chromosome abnormality which occurs in the prophase of first meiotic cell cycle and is also known to be caused by chromosome non-disjunction during the early stages of embryo cleavage. Further scrutiny is required to determine the influence of Ca ionophore on the prognosis of babies.

**Support:**

None.