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Parental advanced age and childhood neurodevelopmental disorders - Nationwide population based study in Korea

Hyeong Sik Ahn, MD, PhD¹, Shin-Young Yim², MD, PhD, Hyun Jung Kim, PhD¹,
Tae Uk Kang, MPH³

1. Department of Preventive Medicine, College of Medicine, Korea University, Seoul, Republic of Korea, 2. Department of Physical Medicine and Rehabilitation, Ajou University School of Medicine, Suwon, Republic of Korea, 3. Health Insurance Policy Research Institute, National Health Insurance Service, Wonju, Republic of Korea

【背景・目的】

In some countries including South Korea, the average age of marriage has increased. The average age of first marriage in South Korea in 2017 was 32.9 years for men and 30.2 years for women. Therefore, there is much possibility that the average age of childbearing has increased, compared to that of the past. While there are some evidence that advanced age of parents is one of the risk factors for neurodevelopmental disorders including intellectual disability (ID) and autism spectrum disorder (ASD) development in offspring, we have to consider other factors to reach conclusions, such as health at conception as well as maternal factors. This study was aims to verify the effects of parental age and health at conception on the risk of ID and ASD in offspring.

【対象・方法】

We performed a population-based cohort study of parents-offspring trios in South Korea during 2003-2015. We collected data for the age and socioeconomic status of the parents at childbirth. We identified following parental diseases at conception such as gastric ulcer, duodenal ulcer, hypertension, diabetes mellitus, asthma, depression, and schizophrenia. We estimated the odds ratio (OR) of ID and/or ASD development in offspring.

【結果】

We set up the cohort of 3,869,860 parents-offspring trios and it represents 65% of the total births during 2003-2015 in South Korea. We identified 10,880 offspring with ID (0.2%) and 5,059 offspring with ASD (0.1%). The paternal age \geq 30 years at childbirth linearly increased the OR of ID and/or ASD development in offspring up to 3.42 and 1.97, respectively. Presence of paternal diseases at conception did not cause any significant increase of OR of ID or ASD development. The maternal age of 30-39 years at childbirth significantly reduced the OR of ID development in offspring down to 0.88, while maternal age $<$ 25 years at childbirth showed a significant OR increase in ID development in offspring up to 2.19. The maternal age at childbirth showed an OR of 1.12 of ASD development in offspring only at the age of 35-39 years. Maternal diseases at conception such as schizophrenia, depression, and type II diabetes mellitus, have significant effects on the risk of development of ID and/or ASD in offspring, independent of maternal age.

【結論】

These findings call for public awareness about the biological implication of delayed fatherhood and the importance of maternal health at a fertile age, on the risk of ID and/or ASD in offspring.