

Preimplantation genetic diagnosis may pose neurological risks

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Preimplantation genetic diagnosis (PGD) has helped many couples conceive healthy children and is generally considered a safe practice. However, a new long-term analysis of PGD in mice suggests that this procedure may increase risks of weight gain and memory decline in adulthood.

PGD is used alongside assisted [reproduction](#) technologies to ensure couples that may be carriers of genetic disease (e.g. Ashkenazi Jews who have a high incidence of Tay-Sachs among their population) don't pass on defective genes to their children. While PGD is not believed to pose any serious health risks, the procedure does involve manipulating the developing embryo and no rigorous long-term studies have been carried out.

Ran Huo, Qi Zhou and colleagues used a mouse model to examine how a blastomere biopsy, as the key manipulation during the PGD procedure, could affect fetal, neonatal and adult development.

They found that there were no differences in [embryo development](#) prior to uterine implantation in the biopsied and control groups, which is consistent with results found in humans. However, following implantation, successful births from biopsied embryos were significantly lower than in controls.

Following birth, the authors tracked many physical and behavioral properties; the two groups of mice were similar in many respects, though

mice in the biopsied group on average had higher body weight and poorer memory in maze tests. To get a more detailed picture of these memory defects, the authors performed a proteomic analysis of adult mouse brains; 36 proteins displayed significant differences between biopsied and control groups, 17 of which are closely associated with neurodegenerative disorders like Alzheimers and Down Syndrome.

The authors suggest that the developing nervous system may be sensitive to blastomere biopsy, and that more studies should be performed to address any possible long-term adverse effects of PGD to ensure its safety.

More information: "Evaluation of Blastomere Biopsy Using a [Mouse Model](#) Indicates the Potential High Risk of Neurodegenerative Disorders in the Offspring" by Yang Yu, Jindao Wu, Yong Fan, Zhuo Lv, Xuejiang Guo, Chun Zhao, Rong Zhou, Zhuo Zhang, Fuqiang Wang, Min Xiao, Ling Chen, Hui Zhu, Wen Chen, Min Lin, Jiayin Liu, Zuomin Zhou, Liu Wang, Ran Huo, Qi Zhou and Jiahao Sha, www.mcponline.org/cgi/content/full/8/7/1490

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