

Genetically selected baby free of inherited predisposition to early-onset Alzheimer's disease

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Is it right to use pre-implantation genetic diagnosis to select an embryo free of the gene for early-onset Alzheimer's disease?

A 30 year old woman with the gene for early-onset Alzheimer's disease, who seems certain to develop the disease by the time she is 40, has used IVF and preimplantation genetic diagnosis to select an embryo that is free of the mutant gene. The woman, a geneticist, has given birth to a mutation-free child. This marks the first time that preimplantation genetic diagnosis has been used to "weed out" an embryo with the defect.¹⁻³

Early-onset Alzheimer's is an inherited, incurable disease striking people in their 30s and 40s. The woman's sister developed the disease at 38 and has been placed in care. Their father was suffering from memory problems when he died at 42 and a brother who also carries the gene had short term memory problems at 35.^{1,4}

Critics of preimplantation genetic diagnosis think there is something morally unacceptable about selecting and rejecting embryos by genetic preference. And the application of preimplantation genetic diagnosis for Alzheimer's is seen as more controversial still because an embryo is being rejected on the basis that it may develop a disease in middle age. Prior to this, preimplantation genetic diagnosis has been used only to select against embryos with disorders that strike in childhood. Some people think that trying to prevent people who are likely to have 40 years of normal healthy life from being born is wrong.⁵

Other critics of preimplantation genetic diagnosis question whether we should be helping the woman have a child at all. Dena Towner and Roberta

Current controversy

The application of preimplantation genetic diagnosis to select against early-onset Alzheimer's has been criticised on several grounds. Some critics think it is wrong to reject an embryo because it may develop a disease later on in middle age and some question whether a woman who will soon become incapacitated and unable to provide for her child should be a candidate for assisted reproductive technology.

Loewy question the choice of "bringing into the world a child for whom the mother will, with near certainty, be unable to provide care". They concede that conceiving a child free of the genetic predisposition for early-onset Alzheimer's disease is a "laudable goal" but argue that the mother's "ethical responsibility" entails more than disease prevention. They ask whether reproduction is a "privilege" or an "inalienable right" that trumps the rights and needs of others.⁶

Yury Vertlinsky who published a report on the family in the *Journal of the American Medical Association* is reported to have said that any difficulties the family might face are "outweighed by the fact that the family's next generation will be free of the problem."⁴ The *JAMA* report recommends informing parents at genetic risk about the possibility of preimplantation genetic diagnosis "so they can make a choice about reproduction" and maintains that this approach is more ethical than suppressing information on the availability of preimplantation genetic diagnosis.⁷

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- 7 See reference 1: 1021.