Selection of the fit and cancer-free; women undergoing IVF treatment could soon be able to select embryos

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Modern science has seen both genetics and fertility treatment develop at a rapid pace since Louise Brown, the world’s first test tube baby, was born on July 25, 1978. The latest ‘miracle’ of medicine was revealed earlier this week by a team of scientists at University College London. British women undergoing IVF treatment may soon be able to select babies that lack two mutant genes — BRCA1 and BRCA2 — linked to breast cancer. Prof Ian Jacobs’s team sent questionnaires via clinical geneticists asking women with a family history of the disease if they will back this move. If the answer is yes, a ‘protocol’ or set procedure will be developed that could be introduced into suitable clinics within four to six months. Screening of IVF embryos for inherited disorders — known as pre-implantation genetic diagnosis (PGD) — is already used to identify cystic fibrosis, haemophilia, Huntington’s disease and Duchenne muscular dystrophy. Doctors take a single cell from the embryo, when it is a cluster of six to eight cells, and tests are carried out to see if it has genetic mutations for a particular condition or disorder. If it does, the embryo is not used to make a pregnancy. Instead, it is discarded and another is chosen which has been given the all-clear. But it is this choice at such an early stage that critics fear could lead to a trend for so-called ‘designer babies’, selected for cosmetic reasons such as hair and eye colour or height.

But Dr Gillian Lockwood, medical director of Midland Fertility Services based in Aldridge, Walsall, is confident the new procedure will not be abused. ‘This has been described as a ‘slippery slope’ that once you can do something good it can go on to do something bad,’ she said. ‘But this is not a ‘slippery slope’. We can differentiate between this process and selecting genes just because a person wants a tall, blue-eyed blonde baby. No mother with the breast cancer gene, given the chance to have a baby that doesn’t have it, is going to say ‘Let’s leave it to Mother Nature’.

In the 1990s scientists discovered two genes, called BRCA1 and BRCA2, that appear to be responsible for the vast majority of inherited breast cancers. These genes can now be targeted in a new PGD test for at-risk women wanting a baby. Dr Lockwood added: ‘Knowing you’ve inherited the breast cancer gene makes your chance of developing the disease very high. It’s almost a racing cert if your sister, mother or grandmother had it as well.’ If these women have daughters they would have to face the same dreaded disease their mothers had dealt with. This would allow these women to have a daughter and know she doesn’t have the threat hanging over her.’

Dr Siobhan Sengupta, of UCL’s Centre for Pre-implantation Genetic Diagnosis, said the new protocol will give women a choice. The questionnaires will not only ask patients for their views on PGD for breast cancer genes, but also where they stand on aborting foetuses found to have BRCA1 and BRCA2. ‘Individuals have very different opinions about this,’ said Dr Sengupta. ‘Some would consider that selecting an embryo that does not carry the mutation is a more acceptable option than terminating an on-going pregnancy.’

Other ethical questions arise over women who wish to eliminate the chance of passing on the mutant genes to their unborn daughters, but do not need fertility treatment. Dr Lockwood, who is also a Human Fertilisation and Embryology Authority (HFEA) inspector, recognises that could be problematic. ‘If a woman needed to have IVF anyway, I see no problem with taking advantage of the technology to make sure only girl embryos are without this cancer gene,’ she said. ‘What’s more difficult is whether a woman who can have children naturally should or could go through the IVF process to eliminate this risk.’

Inherited breast cancers affect about five per cent of the 40,000 women diagnosed with the disease each year in Britain. But if a woman has either or both of the breast cancer genes, she is 80 per cent more likely than average to develop the disease. Once a procedure has been formulated, it must be passed by the HFEA which regulates fertility treatment. Dr Sengupta believes this option could become more commonplace in the not-so-distant future.