IVF and genetic testing: How Pre-Implantation Genetic Diagnosis (PGD) works.

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Introduction

The PGD process begins with the collection of eggs from the woman's ovaries through a process called ovarian stimulation. Once the eggs are retrieved, they are fertilized in a lab dish with the sperm from the partner or donor and the resulting embryos are allowed to develop for several days. During this time, one or more cells are removed from each embryo, usually on the fifth day of development and tested for genetic abnormalities [1].

There are several methods used for PGD testing, including Polymerase Chain Reaction (PCR), Fluorescent In-Situ Hybridization (FISH) and Comparative Genomic Hybridization (CGH). These methods allow scientists to analyze the genetic material within the cells and identify any abnormalities. After the genetic testing is complete, the results are analysed and the healthiest embryos are selected for implantation into the uterus. Typically, only one or two embryos are implanted to minimize the risk of multiple pregnancies. The remaining embryos can be frozen and stored for future use [2].

PGD can be used to screen for a wide range of genetic disorders, including cystic fibrosis, sickle cell anemia and Huntington's disease. It can also be used to screen for chromosomal abnormalities, such as Down syndrome and Turner syndrome. PGD is particularly useful for couples who are carriers of a genetic disorder and want to avoid passing it on to their children. By using PGD, these couples can select embryos that do not carry the genetic mutation and increase their chances of having a healthy child [3].

However, PGD is not without controversy. Some people argue that it is a form of genetic engineering and raises ethical concerns about "designer babies" and the selection of traits beyond medical necessity. Others argue that PGD should only be used in cases where there is a significant risk of passing on a genetic disorder [4, 5].

Conclusion

In conclusion, Pre-Implantation Genetic Diagnosis (PGD) is a form of genetic testing used in conjunction with IVF to screen embryos for genetic disorders before they are implanted into the uterus. The PGD process involves the collection of eggs, fertilization in a lab dish, development of embryos, removal of cells, genetic testing and selection of healthy embryos for implantation. PGD can be used to screen for a wide range of genetic disorders and is particularly useful for couples who are carriers of a genetic disorder. While PGD is not without controversy, it remains an important tool for couples seeking to have healthy children.

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