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PGD and Legal Aspect in Korea

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PGD has been developed as an alternative to prenatal diagnosis (PND) to establish a pregnancy with an unaffected fetus in couples at increased risk of transmitting single gene disorders or chromosomal aberrations. Although the embryo and fetus are on the continuum of the developmental process, the object of genetic analysis and consequent management are considerably different in clinical, psychological, ethical and legal aspects. It is generally accepted that handling (selecting) embryos for transfer may be ethically more acceptable than terminating the life of a fetus in utero in order to avoid the serious abnormal pregnancy. Therefore, the indication of PGD in nature became different from PND as the molecular diagnostic technology improves and are applied to a variety of diseases.

The indication of PGD is extended beyond that of PND to a various disorders, in which decision after PND may be difficult to make, such as late onset diseases with genetic predisposition (Huntington's disease, familial adenomatous polyposis coli, neurofibromatosis). PGD has also been successfully preformed with preimplantation HLA testing for the purpose of establishing an affected pregnancy with a perfect match of HLA, yielding a potential stem cell donor for transplantation to the affected sibling. Others include Rh blood group incompatibility, certain congenital malformations with inherited gene mutation. Recently, preimplantation genetic screening (PGS) or PGD-aneuploidy screening (PGD-AS) has been applied in couples with advanced maternal age, recurrent pregnancy loss or repeated implantation failure to decrease the miscarriage rate and improve the ongoing pregnancy rate in ART. The expanding indication evokes questions at which degree PGD can be allowed.

The prenatal diagnosis is performed in the form of CVS or amniocentesis after a spontaneous pregnancy is established. When a fetus is diagnosed as severely affected, most of the abnormal pregnancies are terminated during the first- or second-trimester according to the couple's decision. In contrast, PGD is performed by embryo biopsy and genetic diagnosis is made before pregnancy and the normal or unaffected embryos are selected for transfer. While PND has the disadvantage of emotional burden, placental retention and endometrial adhesion formation related to the therapeutic abortion, PGD can avoid these problems. However, PGD has disadvantage that the fertile couple should undergo ART and the costly procedure could be repeated. Complications such as ovarian hyperstimulation syndrome, bleeding, infection may occur. Thus, during counseling with the couples, written informed consent including these complications should be obtained.

The law or regulation related to PGD is different among the countries. In some countries, PGD is prohibited and in others, there is no law for PGD. In Korea, law on bioethics and safety is effective from 2005. PGD is allowed with restriction of indication. The genetic testing for the embryo or fetus is allowed only for 63 diseases including single gene disorders, chromosomal structural abnormality and numerical chromosomal abnormalities. However, from the patient and professional's point of view, the selection of small number of monogenic diseases from several thousands of hereditary diseases is not appropriate, because there is no medical basis for this selection and an argument exists on discrimination of one monogenic disease from another monogenic disease. If patients who have monogenic disorders not listed in the law want to get pregnant, they may have to choose "reproductive tourism", which is a difficult option in Asian area, unlike Europe or USA. Currently, preimplantation HLA testing is not allowed in Korea.

There are many ethical/legal issues which should be considered in PGD. One question may be whether to transfer carrier embryos in autosomal recessive or X-linked recessive disorder. As for the indication of PGD, there may be conflicts between patients, medical professionals and politicians on how to define the diseases to be included in PGD: should it be listed as the law of Korea or named collectively as monogenic disorders? Most of the centers in ESHRE consortium as in Korea responded to the questionnaire that social sexing should not be allowed. What can be done in case misdiagnosis is found in mid-trimester? There can be several options for the affected embryos after PGD: either discarding or cryopreservation or use for the research. In dealing with these ethical/legal issues, the knowledge of medical professionals and the opinions of patients who are suffering from incurable illness and representing the minority of the society should be respected.