Measuring Success in Assisted Reproductive Technology

The desire to have children and create a family reflects a strong human need, and thus reproductive failure is among our deepest disappointments. Assisted reproductive technology (ART) has advanced significantly since the birth of Louise Brown 24 years ago, and its extensions are featured almost daily in the scientific and medical literature or in the lay press.

Unfortunately, in the effort to produce a child, infertile couples and reproductive scientists and clinicians are sometimes willing to resort to the implementation of poorly understood procedures, such as cytoplasmic transfer and immature sperm injection or screening methods with uncertain consequences. Preimplantation genetic diagnosis (PGD) is a screening method that was initially developed to limit the transmission of severe inherited disease in fertile couples, but this method is now being applied more widely in cases of infertility, to screen embryos from older women and couples that have experienced repeated in vitro fertilization (IVF) failure. In this method, a single cell is removed from a cleavage-stage embryo and tested for common chromosomal abnormalities, in order to select those embryos most likely to implant and not miscarry. The biopsied and presumptively unaffected embryo is then transferred to the uterus. There may be some comfort in the fact that many thousands of frozen embryos with lost blastomeres survive cryopreservation and thawing and are then implanted in a uterus to produce "successful" pregnancies, but we really do not know the effect of this procedure on the unborn child. We should heed the stark warning given by Schultz and Williams (p. 2188) that the success of ART should be judged not only in terms of the birth of a baby; we must consider more longitudinal criteria, concerning ourselves with the health of the developing child and adult-to-be.

Indeed, efforts are now being made to specifically address the welfare of the child. In the United Kingdom, the Human Fertilisation and Embryology Authority (HFEA) requires that at each annual inspection, clinics show that consideration has been given to the long-term health and safety of the child. The need for oversight is evidenced by the all too frequent practice of introducing excessive numbers of embryos into the uterus of women undergoing IVF procedures. In the United States from 1980 to 1997, there was a 400% increase in the number of triplets born to women in their 30s and a 1000% increase in babies born to women over 40. Prematurity and low birth weight, which are common consequences of multiple pregnancy, carry serious risks: Cerebral palsy and handicap increase 5-fold in twins and 19-fold in triplets. Multiple births can of course be prevented post hoc by selective termination of pregnancy, but that is surely an awful choice for a couple who have spent years (and often many thousands of pounds or dollars) trying to overcome their infertility.

The American Society for Reproductive Medicine (ASRM) now has guidelines in place to limit the number of embryos implanted and thus to reduce multiple pregnancies. However, in many parts of the world, there is little or no regulation governing the implementation of new assisted reproduction techniques, even in cases where risk is clearly indicated, as in the well-advertised efforts to pursue human cloning. Furthermore, when bodies such as the HFEA act, they often face criticism from opponents of regulation, including many who are committed to the safety of ART and to the welfare of the child, for being too slow in the introduction of novel techniques or for being too restrictive.

The United Kingdom and the United States now require the registration of ART treatment cycles with the HFEA or ASRM, respectively, for the purpose of monitoring clinic efficacy. Data gathering such as this, and also by groups such as the Eurpoean Society for Human Reproduction and Embryology (ESHRE), which collects anonymized information after PGD, should be extended to follow the health of the children as they develop, while at the same time protecting personal privacy. Perhaps the Medical Research Council, the National Institutes of Health, and the European Union might consider ways to fund an international collaborative venture in the interest of the present and future public health. After all, it is the children that matter.

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