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A need for definition: a matter of life and death for human embryos

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Sir,

A recent IMJ commentary[1] on brain stem death criteria summarised ethical and technical issues concerning “end of life decisions”, and we concur that physicians should have competence in eliciting the proper sequence of brain stem signs in clinical practice. However, a truly comprehensive dialogue on the definition of death should address another question that confronts IVF clinics in Ireland each day—when does a human embryo die?

Despite the enormous social and political energy focused on “right to life” issues over recent decades, the death of a human embryo remains a sadly forgotten topic. As Dr Murphy indicated[1], the introduction of brain stem death criteria in 1967 recognised permanent loss of consciousness and spontaneous breathing after the inactivation of essential human neural elements. But our IVF clinics and allied research facilities are responsible for human life well before any discrete neurological system has developed. For practitioners and scientists engaged in the care of these tiniest of “patients”, a relevant definition of death should not be neglected.

Death is a more frequent visitor to the IVF laboratory than to the critical care unit or ICU, yet fertility clinics have no exact definition of it for our embryos. Indeed, the natural history of the human embryo (whether inside the womb or in vitro) depicts an astonishing mortality rate in the first few days after fertilisation. If one sets the beginning of life at fertilisation, without question the highest absolute death rate occurs in the 8-10 days before the embryo implants on the endometrial (intrauterine) surface[2]. Evidence is accumulating that genetic problems contribute to much of this pre-implantation attrition. This process of human embryo senescence and death is becoming more widely appreciated in the reproductive science literature, and this increased attention should enable medical and public policy leaders to address the growing need for human embryo death criteria. It has been proposed that an irreversible arrest of cell division, rather than the death of each constituent cell of the embryo, is the best measure of organismic death for the human embryo[3]. We agree that scientific advancements are so rapid in this area that any regulation and legislation will need to be kept under continual review[4].

Not having a definition of human embryo death impacts both clinicians and researchers. The majority opinion carried in the Report of the Commission on Assisted Human Reproduction (2005) held that research on human embryos should be permitted, but only on surplus embryos[5]. Legislative ambiguity on stem cell research has frustrated serious research endeavours here, necessitating importation of human embryos from outside Ireland[6]. A definition of human embryo death could change that.

Just as tissue harvesting for organ donation is conditional on an exact definition of death, blastomeres (or embryonic stem cells) obtained from organismically dead, non-viable embryos could serve an analogous role without hastening the natural process of embryonic death. Having human embryo death criteria would thus offer an unusual collaborative opportunity to share a starting point for preserving human dignity, respect for life, and biomedical research in this promising field. If this definition were achieved, then scientific work involving human embryonic stem cells could progress within the same familiar ethical framework already used for organ donation and transplant surgery. This concept is important not only for clinicians taking care of comatose patients. A relevant definition of death also matters to those entrusted with human embryo life derived from IVF treatments. Doctors, lawyers and ethicists have had 40 years to refine brain stem death criteria. We suggest the time is right for an equally collaborative, robust definition of death for IVF embryos.

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