Parvus Error in Principio Magnus Est in Fine. The Use of Microcarriers for Cryopreservation in the Assisted Reproduction Industry

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"A small mistake in the beginning is large in the end". This phrase made famous by Aristotle’s reiteration of Plato’s warning still holds good in spite of the passage time.

The last decade and a half was witness to the application of non-aseptic techniques for the ultra rapid cryopreservation by vitrification of transplantable human gametes, embryos and tissues in the assisted reproduction industry. This situation persists to this day. Fortunately the need for asepsis in vitrification is now being revived by some members of the industry.

In the 1980s and 1990s research to develop vitrification techniques of cryopreservation of embryos and gametes appeared headed in the right direction. Then in the early 1990’s onwards micro carriers for vitrification were developed [1-5] in which asepsis proved difficult to maintain or could not be attained.

Nevertheless the use of microcarriers in vitrification was adopted as a strategy for achieving vitrification by some workers. Their published work appear to have lent credence to the application of non-aseptic methods in healthcare because soon after the publication of these reports a vast array of other non-aseptic micro “open” techniques of embryo, gamete and tissue cryopreservation were developed [6,7] and were used on a global scale in healthcare for more than a decade, and are still being used in some clinics.

The direct contact of transplantable gametes, embryos and tissues with non-sterile and “dirty” liquid nitrogen is non-compliant with Good Clinical Practices (GCP) and is potentially hazardous [8-10] to the patient and possibly the fetus.

While the risk may appear minimal or theoretical but the threat of contamination and disease transmission is real. Besides microbial contamination exposure to environmental pollutants is another concern why “open” cryopreservation should be avoided. The use of open microcarriers continues to the present times. This situation poses serious regulatory and practical problems in the assisted reproduction industry.

Alternate efficacious safe aseptic methods of cryopreservation have to be developed and adopted within a stipulated time frame in an effort to institute GCP-compliant techniques in healthcare.
References


