Cryo-survival of spermatozoa

Dear Sir,

Andrology centres and assisted conception units throughout the country are always excited to see pioneering work, aimed at producing significant improvements in the cryo-survival of spermatozoa. Even with the best technique, spermatozoa frozen in nitrogen vapour or even using controlled rate freezing are significantly poorer (in terms of motility/viability) once thawed. Patients referred for cryopreservation prior to chemotherapy/radiotherapy, etc., are invariably forced to undergo further trauma when it is found that their sperm survival is poorer than imagined, and in-vitro fertilization (IVF) or even intracytoplasmic sperm injection (ICSI) is their only hope of a child.

At first glance, the recent study (Morris et al., 1999) which describes a novel method of controlled rate freezing appeared to offer some hope and suggests that significant advances are around the corner. However, on closer examination, our initial excitement was unfortunately dampened, with it leaving more questions than answers.

Firstly, how repeatable are the results? It seems that only three experiments were carried out (experiment nos. 1, 2 and 3), but consisted of eight, four and seven different methods respectively, hardly constituting repeat experiments. Why was a Planer freezer (used widely in the field) included in only one experiment? Surely, bearing in mind the huge variation in individual responses to cryopreservation, it would have been better to select fewer freezing methods and test the spermatozoa of 10 different semen donors.

Secondly, in Table I, one assumes the asterisked footnote relates to the hypo-osmotic swelling (HOS) test column and not to the column heading A motility (normalized). In what sense is the motility normalized? Is this some kind of statistical transformation as there does not appear to be one mentioned in the text. What quality control procedures were in place? How reliable and repeatable are the motility measurements? Why were quantitative motility measurements using a computer-assisted semen analysis (CASA) system, not made? Have the measurements been videotaped for verification by others using CASA?

Were different cryoprotectants or the rate at which they are added tried or tested? Previous work (Storey et al., 1998), clearly demonstrated the importance of not only the constituents of the cryoprotectant, but perhaps more importantly, the rate at which it is added to the semen. Could non-linear cooling be used on other types of programmable freezers, e.g. Planer, and if so has this been tested?

The word ‘significant’ is dashed liberally throughout the text, yet without a hint of a statistical method or \( P \) value in sight. Were any statistics used? And if so which ones? And exactly how significant were the results?

Investment in controlled rate freezers is not something centres do often. Particularly with the cryopreservation of spermatozoa, the clinical community needs to know whether such technology is really cost-effective, especially as vapour freezing (despite its limitations) works for many and is relatively cheap. Unfortunately, the study described here leaves a number of questions unanswered, which need to be addressed before centres can make any decisions about changing their practice.

References


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