Letters to the Editor

Safety during sperm banking

Dear Sir,

Bahadur and Tedder (1997) consider the possibility of cross-contamination of viral material between semen samples during cryopreservation. For semen donors requiring more or less immediate storage of their personal semen, sealing of the samples (in addition to serum testing) as described, appears to be a good method to provide safety against viral cross-contamination. We recently were also confronted with the subject of cross-contamination in our semen bank, encountering an anonymous semen donor who became human immunodeficiency virus (HIV)-positive in the course of his donorship. This was a good opportunity for us to scrutinize our procedures.

The description of Bahadur and Tedder seems apt especially for cases in which personal semen has to be preserved urgently. For banking of semen from anonymous semen donors, i.e. donors donating semen for general use for infertility treatment, alternative methods preventing cross-contamination can be considered. The reason is that semen from anonymous donors differs with that from non-anonymous (personal) donors in several respects: (i) once donated, the semen is no longer personal—the donor can never reclaim it; (ii) there is no urgency neither with regard to the preservation nor to the availability of the semen; (iii) the donor visits the bank and provides semen regularly and for a long period of time. These characteristics make feasible a system which supplies semen that is safe in terms of coming from a safe donor as well as being free from cross-contamination, without the need for specific storage devices or sample sealing.

The essence is that, when introducing samples into the bank, a quarantine system is used in which samples from the tanks used for quarantine are released simultaneously. This release should not take place before all donors who provided semen samples to the tank have been shown to be seronegative for (at least) half a year following the last donation into the tank. Simultaneous release thus is a safeguard against cross-contamination. This in contrast to quarantine carried out on an individual basis, in which case semen samples are transferred from the quarantine tank continuously, only depending on the fulfilment of the quarantine for the individual donor. The latter way of operating enables the possibility of removing semen from a tank in which semen from an infected donor has been placed, a situation that may have occurred simply while the results of a periodic serum control of this donor were not yet known.

Revising our procedures accordingly, we have been using the generally accepted window phase of a half year to watch for seroconversion. Working out a system with simultaneous release of samples from tanks using a half year window phase, a so-called ‘quarterly system’ appeared to be most convenient. In this way of operation, all new samples from anonymous donors are introduced in one of four tanks, depending on the date. We poetically called these tanks ‘spring’, ‘summer’, ‘autumn’ and ‘winter’ tank. Each tank is used for 3 months, and subsequently closed, until for all donors providing semen to the tank the serum investigations (at least) half a year following their last donation to the tank have been found negative. Following this period, the semen samples from the tank are released to the ‘free-for-use’ pool. To guarantee sufficient throughput through the system the donors have to be tested every 3 months. Furthermore, to minimize the chance of introduction of semen from a seropositive donor in the tank, donors always undergo serum testing prior to their first admission.

In case one of the donors supplying to the tank is found to be or has become seropositive within the half year period that the tank is kept closed, all contents of the tank will be discarded, and the tank is decontaminated. This makes the maximal risk for the bank the (rare) loss of one quarterly tank. Operation of the system and consequent application of the procedures is administratively controlled using a self-developed computer program. In this way we believe our ‘quarterly system’ keeps the free-for-use pool of semen from anonymous donors maximally free of risk for transmission of infectivity.

References


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Quarantine and cryopreservation

Dear Sir,

In one of a number of strategies aimed towards minimizing the risk of microbial cross-contamination, Janssens (1997) proposes the use of ‘a bank for all seasons’. Quarantine of material prior to release has become a standard practice in many fields. However, such a strategy is a double-edged sword. Following Janssens’ proposal, a single donor found once a year to be infected with human immunodeficiency virus (HIV) would cause a discard of 25% of the annual semen stocks. To determine whether this is a sensible approach, one has to know the incidence of acute infections in the donor panel, thus allowing an estimate of the potential damage and loss of stock.

A much more likely problem appears not to be addressed by Janssens. In other fields it is not uncommon for donors whose material has been archived to be lost to follow-up. In such a situation one is then left with an archive which cannot be released for use since it is not possible to exclude a potential infection amongst the donors whose samples compromised the quarantined stock. Clearly, although the risk of such donors being HIV-infected and sero negative must be small, operating...
practices have to be standardized to take into account the very high likelihood of donors being lost to follow-up.

High quality donated semen in the UK is currently in short supply and is a fragile resource. Added to this, there are the additional costs of the rigorous screening processes (Barratt et al., 1993) and counselling which are applied to all donors from whom material is cryopreserved. The loss of an archive for whatever reason will therefore be a very costly process. An alternative approach, but a costly one, would be to introduce genome detection for the relevant microbial pathogen at the time of semen donation.

Janssens briefly touches on another subject, 'donor sperm ownership'. Unlike The Netherlands, sperm donors in the UK may choose to keep some of the semen for their own use, although clinics would be unwilling to recruit such donors for various administrative reasons. However, once taken on the programme, a sperm donor could technically reclaim the frozen sperm for personal use only by altering the nature of his consent. To then discard his samples because of another donor's HIV seroconversion could present an interesting legal case.

Our approach to sealing each vial with 'Nescofilm,' was one of allowing maximum safety to all groups of samples stored and one which was cost-efficient (Bahadur and Tedder, 1997). It also took account of potentially new infectious agents that may become an issue. Recently there has been much interest in the infectious virus HHV-8 (Howard et al., 1997).

Janssens' idea of simultaneously releasing samples is welcomed and adds usefully to addressing ways of minimizing cross-contamination in sperm banks. As we had pointed out, there was a need to move towards increased safety in cryopreservation procedures by sealing vials, moving away from straws and considering vapour phase storage in the longer term.

References

1Gulam Bahadur and 2R.S.Tedder
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2University College London Medical School, Department of Virology, The Windeyer Building, 46 Cleveland Street, London W1P 6DB, UK

Erratum
A new combined in-vitro test model for the identification of substances affecting essential sperm functions
by E.Hinsch, A.A.Ponce, W.Hägele, F.Hedrich, F.Müller-Schlösser, W.-B.Schill and K.-D.Hinsch


Part of the Abstract of this article was published incorrectly. The error occurred in line 20 of the Abstract, where the figure 22% was incorrectly given as 2.2%.

The complete sentence in the Abstract should have read:

Treatment of post-thaw bovine spermatozoa with progesterone (1 μM) or bovine follicular fluid (20%) induced the acrosome reaction from 12% (untreated spermatozoa) to 25% (P < 0.001) and to 22% (P < 0.01) respectively.

The corrected figure is underlined.