



Press release - International Federation of Fertility Societies

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New sperm-freezing technique dramatically improves viability of frozen sperm, and may allow safe use of sperm from HIV+ men

A new technique for freezing sperm can dramatically increase the viability of frozen sperm. In addition, as the technique does not involve the freezing of seminal plasma, it holds out the possibility of allowing sperm from HIV+ men to be used without the danger of transmitting the virus.

The technique has been developed by a team from Temuco (Chile) and Ulm (Germany), led by Professor Raul Sanchez (La Frontera University, Temuco, CHILE), and is presented at the World Congress of Fertility and Sterility in Munich, Germany.

Currently, sperm is frozen slowly and then stored in liquid nitrogen at -160°C . This technique allows recovery of around 30 to 40% activity. However the current technique has drawbacks, including loss of motility and vitality, and damage to the membrane

The new technique is called sperm vitrification (egg and embryo vitrification are already in use in fertility clinics). Sperm are centrifuged to remove the plasma components, and then resuspended in a sucrose solution before being plunged into liquid nitrogen to fast-freeze. The vitrified sperm can then be stored either in liquid nitrogen or in an ultra-cold deep freeze at -86°C . This gives several advantages over the existing method, including a significant increase in motility of the rethawed sperm (77% motility versus 29% using current methods). In addition, it seems that the sperm are less damaged by the vitrification technique.

It means that a higher concentration of viable sperm can be recovered prior to IVF techniques such as ICSI, which will give a greater chance of fertilization.

As a by-product of the technique, the removal of the sperm plasma means that the technique will separate the sperm from many contaminating agents, such as HIV and other viruses, giving HIV+ men the chance to father children without the likelihood of passing on the virus to the mother and child.

Commenting, lead researcher Professor Sanchez said:

“This work shows that we can preserve functional sperm via vitrification, which gives a greater chance of success for patients with low sperm counts. Conventional methods only preserves between 3% or 40% of the sperm viability, with the new methodology it is closer to 80%.

The other great advantage of this technique is that it can eliminate potential sources of infection such as AIDS or hepatitis b, which are present in seminal plasma. In this process we discard the seminal plasma, with the sperm being vitrified in culture medium. It has the potential to allow HIV+ men to have children without worrying about transmitting the virus”.

Commenting, Professor Ian Cooke of the IFFS said

“This looks a very exciting technique, as it is much faster than the conventional slow-freeze procedure. In addition, the prospect of use with HIV+ patients has great potential, although we’d want to confirm the absence of residual HIV in sperm samples before going ahead”.

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Notes for Editors

This work is being presented during the 20th World Congress on Fertility and Sterility, which is taking place in Munich from 12-16 September, <http://www.iffs2010.com/>

The World Congress on Fertility and Sterility is organised by the International Federation of Fertility Societies (IFFS), which represents national fertility societies from all parts of the world. We have more than 70 member societies from all parts of the World. The IFFS website is <http://www.iffs-reproduction.org/>
The next World Congress will take place in Boston in 2013.

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ABSTRACT

Vitrification sperm bank: The new aseptic technique for human spermatozoon criopreservation

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Introduction: Nowadays, the conventional freezing of spermatozoa is used for the preservation of fertility in patients with cancer or for programs in reproductive medicine. However, these techniques causes notorious chemical-physical damage to the extracellular and intracellular sperm membranes, due to an increased lipid peroxidation, decrease of the sperm motility, mitochondrial activities, and induction apoptosis markers. As an alternative, we have developed a vitrification aseptic technique that preserves just the sperm cells without seminal plasma and permeable cryopreservants.

Material and methods: The sperm suspension obtained after swin-up is centrifugated and separated to conventional freezing or vitrification technique. The sperm resuspended in 50-100 μ l of vitrification solution (0,25 M sucrose and HTF-HSA 1%) is placed in 0.25 ml insemination straw (IE). The IE with spermatozoa were first placed inside a sterile 0.5 ml insemination straw, which was hermetically closed by heat at both sides, and then plunged into liquid nitrogen. The warming is performed by quick direct submerging of 0.25 IE, into 5ml of HTF-HSA 1% (pre-warmed to 37° C).

Results: This vitrification technique is better compared to conventional freezing by preserving the sperm function adequately, with high motility (77,0 \pm 2,5% v/s 29,3 \pm 1,6%, P< 0.01), low cryocapacitation evaluated by phosphatidyl serine translocation (20,1 \pm 1,1% v/s 1,6 \pm 0,9%, P< 0.01), intact potential mitochondrial activity (71,7 \pm 1,7% v/s 29,5 \pm 4,3%, P< 0.01), low DNA fragmentation (2.4 \pm 0.5% v/s 2.8 \pm 0.5%, P>0.05) and preserves the acrosome and membrane integrity (72,0 \pm 6,9% v/s 58,6 \pm 1,7%, P< 0.05; and 64,3 \pm 7,5% v/s 21,2 \pm 5,0 % , P< 0.01 respectively). This technique also allows 2 different ways of storage , -86 ° C (refrigerator) or at -196 ° C (liquid nitrogen) showing no differences in the three more important sperm function parameters post-warming (motility, potential mitochondrial activity and DNA fragmentation). **Conclusion:** These results suggest the possibility for eliminating the use of liquid nitrogen to freeze the male gamete. This vitrification technique, that allows to preserves intact most the functions of sperm cells, is an easy, speedy and cheap alternative for sperm bank cryopreservation. On the other hand, as the technique uses spermatozoa free of seminal plasma components, its can be applied to samples with different pathologies (AIDS and other sexual transmission diseases).