g.en.e.r.a.

CLINICA VALLE GIULIA, Rome

The search for excellence in IVF: a practical approach

ESHRE CAMPUS 2010:
Maribor Slovenia, 22-23 January 2010

Oocyte cryopreservation: slow cooling versus vitrification

Laura Rienzi, Rome, Italy

g.en.e.r.a.

Question:

Oocyte cryopreservation:

slow cooling versus vitrification?

Vitrification!!!!!!!

THANK YOU FOR THE ATTENTION

g.en.e.r.a.

Possible injuries

g.en.e.r.a.

Membrane permeability

60-65% 35-40% 75-80%

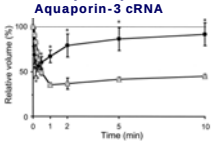
Survival rates of human oocytes frozen with the same slow freezing protocol

(Lassalle et al., 1985)

Aquaporin-9, a protein channel that can transport water and other solutes through the plasmalemma is expressed in rat GV-stage but not mature oocytes (Ford et al., 2000)

+	+	Permeability
+	-	Aquaporin-9 expression

Osmotic response to glycerol of mouse oocytes injected with Aquaporin-3 cRNA



Edashige et al., 2003

g.en.e.r.a.

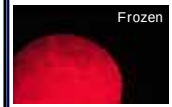
Possible injuries

g.en.e.r.a.

Cortical granules release

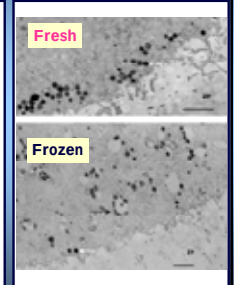
No evidence of cortical granule discharge in cryopreserved oocytes

Gook et al., 1993



"The immunostaining examination for CG of the frozen–thawed oocytes did not reveal evidence of the premature release of CG."

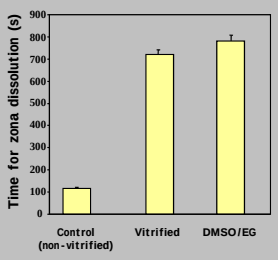
Li et al., 2005



Ghetler et al., 2006

g.en.e.r.a.

Zona Pellucida Hardening

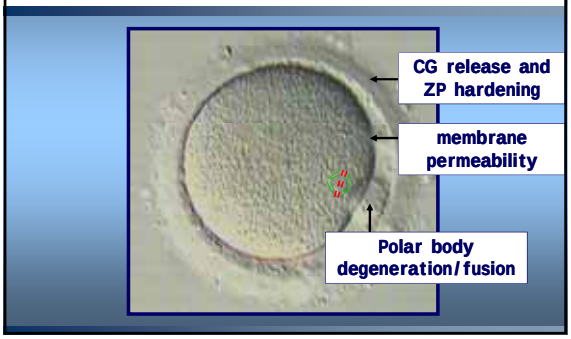


Larman et al., 2006

n = greater than 60 oocytes per treatment with 3 replicates

g.en.e.r.a.

Possible injuries



g.en.e.r.a.

Aneuploidy and PB retention

Early reports on failure of PBII extrusion and increase of aneuploidy in thawed mouse oocytes

Glenister et al, 1987; Carroll et al., 1989

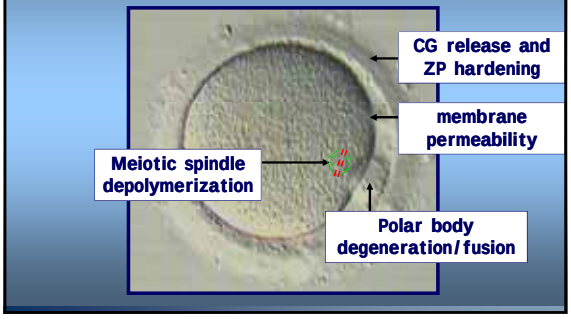
	No. of Oocytes (%)		
Frozen	Scored	% Aneuploidy	% Retention PB
+	352	6.4	2.6
-	218	8.0	4.4

No increase in the rates of aneuploidy/digyny in parthenogenetically activated mouse oocytes after cryopreservation with DMSO/slow freezing

Bos-Mikich and Whittingham, 1995

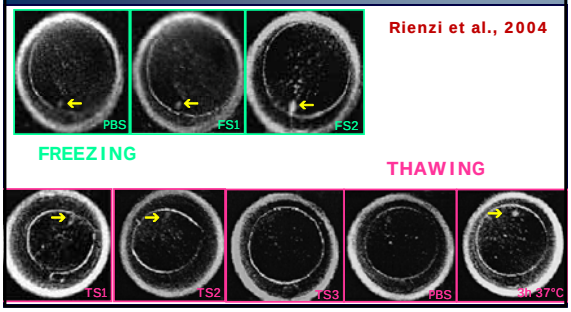
g.en.e.r.a.

Possible injuries



g.en.e.r.a.

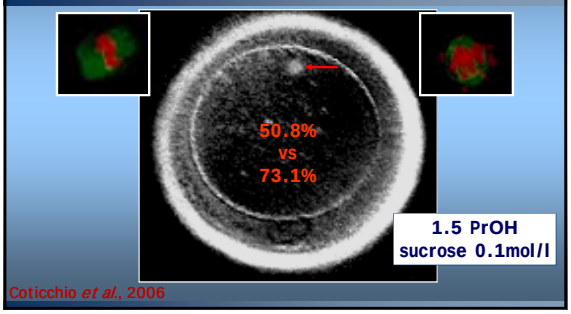
Meiotic spindle analysis during slow freezing



Rienzi et al., 2004

g.en.e.r.a.

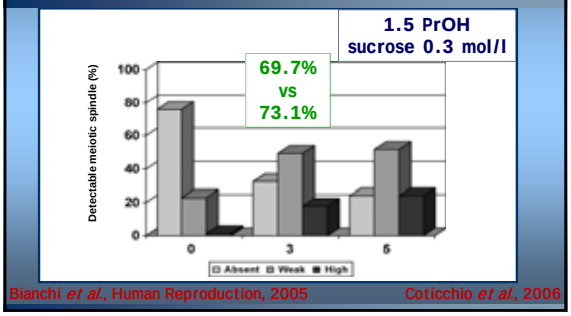
Meiotic spindle analysis during slow freezing



Coticchio *et al.*, 2006

g.en.e.r.a.

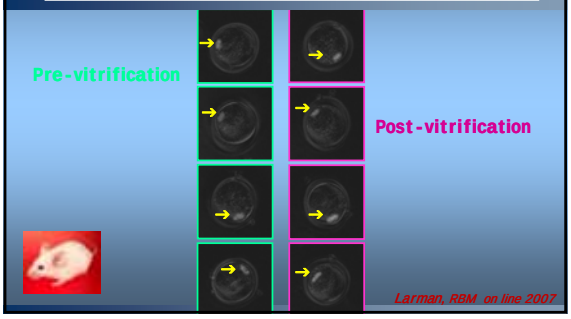
Meiotic spindle analysis during slow freezing



Bianchi *et al.*, Human Reproduction, 2005 Coticchio *et al.*, 2006

g.en.e.r.a.

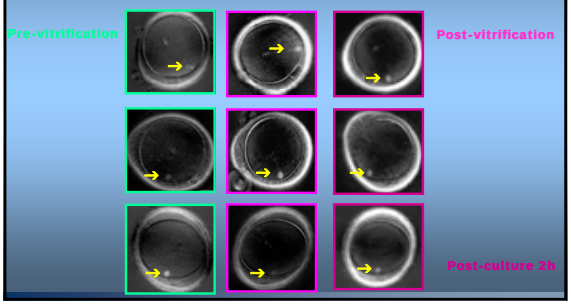
Meiotic spindle analysis during vitrification



Larman, RBM on line 2007

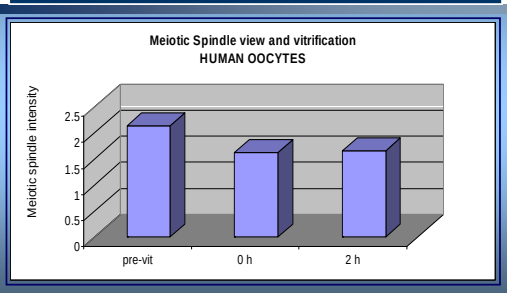
g.en.e.r.a.

Meiotic spindle analysis during vitrification



g.en.e.r.a.

Meiotic spindle analysis during vitrification



Larman, RBM on line 2007

g.en.e.r.a.

Meiotic spindle analysis during vitrification

Table 2. Morphological analysis of meiotic spindle and metaphase plate

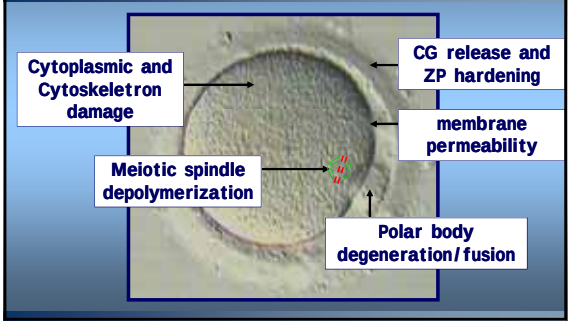
Cryopreservation protocol	Spindle shape		Metaphase plate chromosome alignment	
	Normal (barrel shaped)	Abnormal	Normal	Slightly abnormal
Control (fresh oocytes)	23 (88.5)	3 (11.5)	25 (96.2)	1 (3.8)
Slow freezing + 0.2 mol/l sucrose	17 (81.0)	4 (19.0)	19 (90.5)	2 (9.5)
Slow freezing + 0.3 mol/l sucrose	19 (82.6)	4 (17.4)	20 (87.0)	3 (13.0)
Slow freezing + choline replacement	16 (88.9)	2 (11.1)	17 (94.4)	1 (5.6)
Vitrification by Cryotop method	13 (76.5)	4 (23.5)	16 (94.1)	1 (5.9)

Values are number (percentage). There were no statistically significant differences in spindle and chromosome configurations between cryopreserved and fresh oocytes.

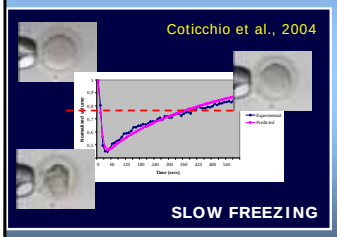
Cobo et al., RBM on line 2008

g.en.e.r.a.

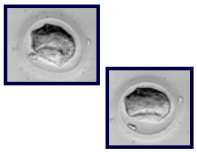
Possible injuries



Osmotic toxicity



VITRIFICATION



Osmotic toxicity

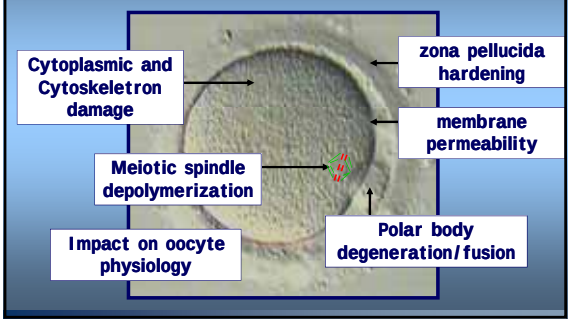
OOCYTE OSMOTIC TOLERENCE AND OOLEMMA PERMEABILITY

Temperature of exposure influence shrinking (swelling) patterns

- Oocyte shrinkage tolerance is about 30% of their initial volume
- At 22°C, EG has a lower permeability coefficient relative to DMSO and PG
- The membrane is more selective for EG and DMSO than for PG (mean reflection coefficient Sigma lower for PG)
- Permeability coefficients of individual oocytes varied substantially (inherent biological variability)

Van den Abbeel et al., 2007

Possible injuries



Oocyte metabolism post-cryopreservation

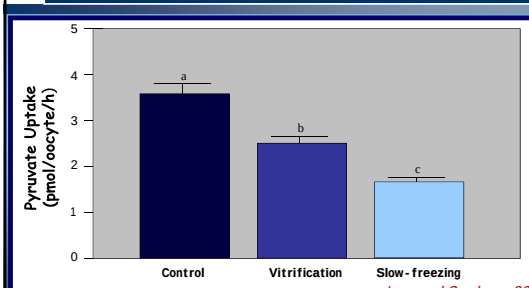
METABOLISM MONITORING THROUGH PYRUVATE UPTAKE (mouse oocytes):

Mouse oocytes and developing embryos following slow freezing were metabolically impaired compared with those that were vitrified

...although vitrification was also associated with a decrease in nutrient utilization by the oocyte compared to controls the decrease was significantly smaller than that induced by slow freezing.

Lane and Gardner, 2001; Lane et al., 2002

Oocyte metabolism post-cryopreservation



Lane and Gardner., 2001

Oocyte protein profile post-cryopreservation

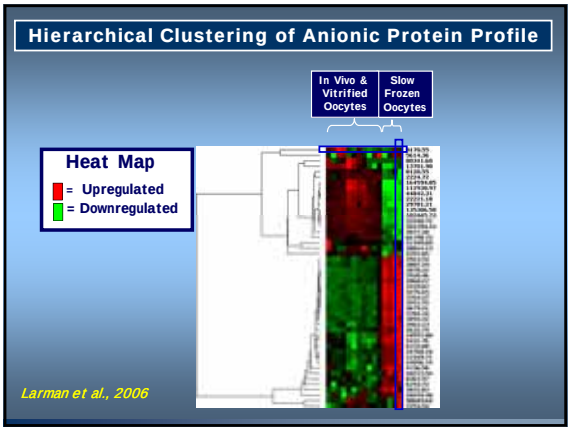
PROTEOMIC ANALYSIS OF OOCYTE PROTEIN PROFILES (mouse oocytes) by SELDI-TOF MS:

Mouse oocytes following slow freezing revealed major alterations compared with those that were vitrified.

Vitrified oocyctes appeared to be similar to the non-cryopreserved control oocytes...

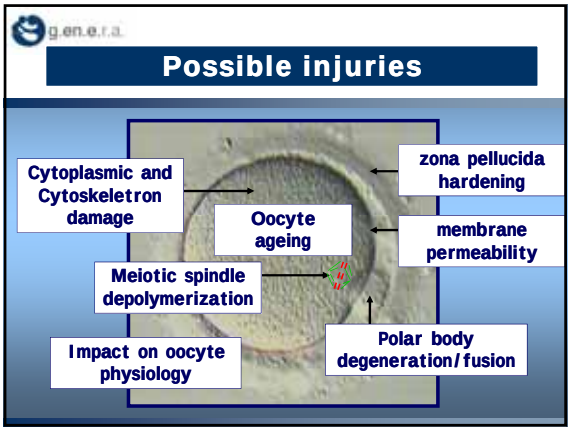
Larman et al., 2006

Hierarchical Clustering of Anionic Protein Profile



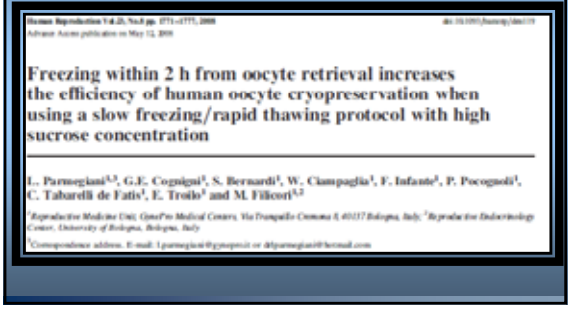
g.en.e.r.a.

Possible injuries



g.en.e.r.a.

Oocyte aging



Freezing within 2 h from oocyte retrieval increases the efficiency of human oocyte cryopreservation when using a slow freezing/rapid thawing protocol with high sucrose concentration

L. Parmegiani[1,3], G.E. Cognigni[1], S. Bernardi[1], W. Ciampaglia[1], F. Infante[1], P. Pocognoli[1], C. Taharelli de Fatis[1], E. Troilo[1] and M. Filicori[1,2]

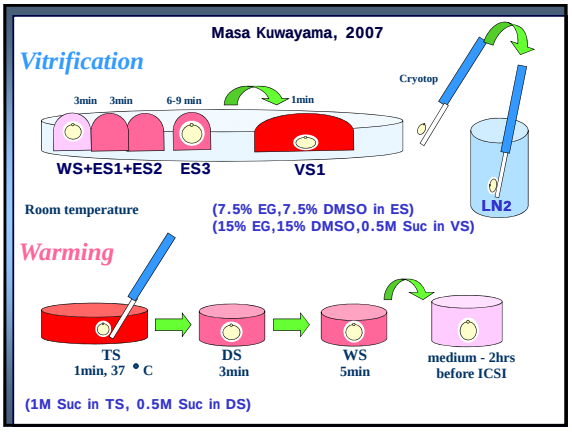
Oocyte safety

Oocyte cryopreservation poses certainly specific problems:

- The oolemma and not the size of MII oocyte is the key to explain the low survival rates obtained with slow freezing.
- Release of cortical granules (controversial)
- Chemical toxicity from cryoprotectants (type specific)
- Osmotic toxicity
- Meiotic spindle depolymerization (slow freezing)
- Oocyte physiology alteration (metabolism and protein profile) especially true for slow freezing

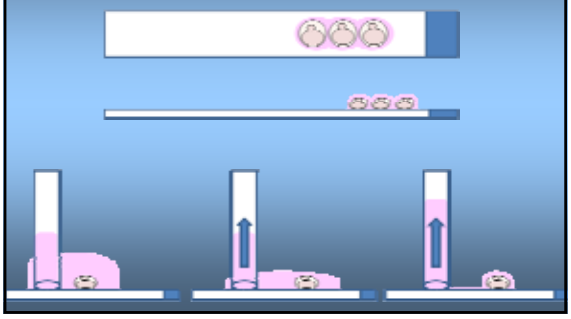
Technical aspects

1. Cryoprotectants toxicity
   (⬇ slow freezing, ⬆ Vitrification)
2. Ice crystals formation and physical damage
   (⬆ slow freezing, ⬇ Vitrification)
3. Direct contact with nitrogen
   (⬇ slow freezing, ⬆ Vitrification)



g.en.e.r.a. www.generaroma.it

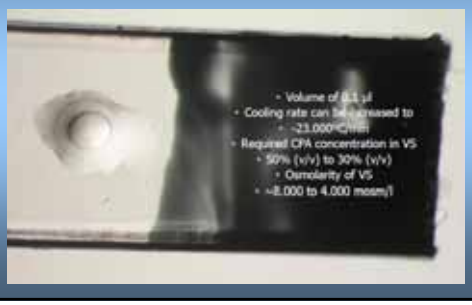
Minimization of vitrification volume



g.en.e.r.a. www.generaroma.it

Minimization of vitrification volume

Cobo et al., 2009



g.en.e.r.a.

Safety of the procedures

Concerns

"The most widely emphasized concerns… are toxicity and danger of contamination.

Unfortunately, available vitrification methods still struggle with these problems to date"

Son and Tan, 2009

g.en.e.r.a.

Direct contact with nitrogen

OOCYTE CONTAMINATION:

- Not sterile procedure
- Liquid nitrogen may be contaminated by the surface of straws/cryovials or other tools
- Risk of liquid nitrogen mediated disease transmission

Tedder et al., 1995; Fountain et al., 1997; Berry et al., 1998

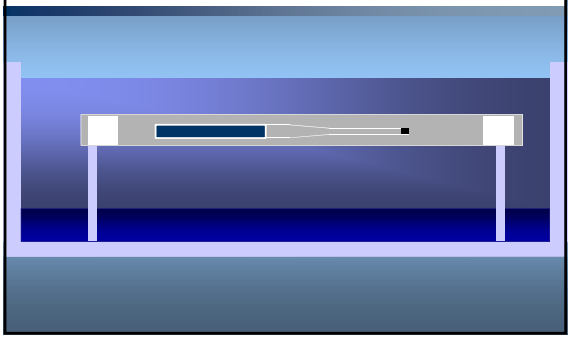
SOLUTIONS:

- Use of sealed system to avoid direct contact
- Cooling and storage in liquid nitrogen vapors

Larman et al. 2006, Cobo et al., 2007

g.en.e.r.a.

Closed storage



g.en.e.r.a.

OUTCOMES

1. Laboratory OUTCOMES

2. Clinical OUTCOMES

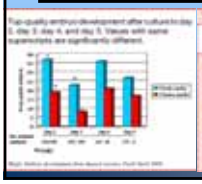
g.en.e.r.a.

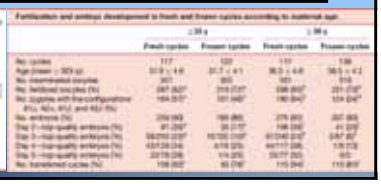
Laboratory outcomes: Slow freezing infertile population

Impact of oocyte cryopreservation on embryo development

M. Cristina Magli, M.Sc., Michela Leppi, B.Sc., Anna P. Ferraretti, M.D., Alessandra Capoti, B.Sc., Alessandra Ruberti, B.Sc., and Luca Gianaroli, M.D.

Reproductive Medicine Unit, Società Italiana Studi Medicina della Riproduzione, Bologna, Italy





g.en.e.r.a.

Laboratory outcomes: Vitrification infertile population

human reproduction ORIGINAL ARTICLE Embryology

Embryo development of fresh 'versus' vitrified metaphase II oocytes after ICSI: a prospective randomized sibling-oocyte study

Laura Rienzi[1], Stefania Romano, Laura Albricci, Roberta Maggiulli, Antonio Capalbo, Elena Baroni, Silvia Colamaria, Fabio Sapienza, and Filippo Ubaldi

G.E.N.E.R.A. Centre for Reproductive Medicine, Clinica Valle Giulia, via de Notaris 2B, Rome, Italy

[1]Correspondence address. E-mail: rienzi@generaroma.it

g.en.e.r.a.

Study Design

- In order to validate the effectiveness of a vitrification approach for oocyte cryopreservation a prospective comparison was designed in our population of infertile patients (september 08 - march 09).
- This study was set-up as a non-inferiority trial with a prospective target of 240 sibling metaphase II oocytes obtained from an estimated 40 ICSI patients
- Oocyte fertilization rates after ICSI (per warmed oocyte and per injected oocyte) were evaluated as primary outcomes. Secondary outcomes were pronuclear morphology and embryo development.

Rienzi et al, 2010- Human Reproduction

g.en.e.r.a.

Patient population

Table I Patient's baseline characteristics and fresh cycle parameters

	Patients included (N = 40)
Female age (mean years ± SD)	35.5 ± 4.8
Baseline FSH (mean mIU/ml ± SD)	6.44 ± 3.1
Previous IVF attempts (mean ± SD)	0.58 ± 1.0
GnRH-agonist long protocol (%)	31/40 (77.5)
Antagonist protocol (%)	9/40 (22.5)
Days of stimulation (mean ± SD)	10.8 ± 1.95
Total gonadotrophin amount IU (mean ± SD)	2201.65 ± 765.7
Number of COCs retrieved (mean ± SD)	13.3 ± 4.5
Number of MII oocytes (mean ± SD)	10.7 ± 3.6
Number of MII oocytes vitrified (mean ± SD)	6.3 ± 2.8

COC, cumulus corona oocyte complex; MII, metaphase II.

Rienzi et al, 2010 - Human Reproduction

g.en.e.r.a.

Materials and methods

- The general idea of the study was to minimize extra stress on oocytes often related with cryopreservation procedures, namely:
  1. Long exposure to Hepes buffered media, with uncertain temperature control, for oocyte denudation and selection under the inverted microscope
  2. Prolonged oocyte *in vitro* culture without the protection of cumulus and corona cells
  3. Oocyte ageing
- In this way, by using randomized sibling oocytes the only difference between the fresh and the vitrified group was the vitrification procedure itself followed by 2 hours of *in vitro* culture.

Rienzi et al, 2010 - Human Reproduction

g.en.e.r.a.

Laboratory Outcomes

Table III Primary and secondary outcomes measures: fertilization, pronuclear morphology, embryo development and embryo morphology of fresh and vitrified sibling oocytes

	Fresh ICSI	Vitrified/Warmed ICSI (%)	Absolute difference (%) (95% CI)	OR (95% CI)	P
Fertilization (2PN) per sibling oocyte	100/120 (83.3)[a]	95/124 (76.6)[a]	−6.73 (−16.6 to 3.39)	0.65 (0.33 to 1.29)	0.20
Fertilization (2PN) per injected oocyte	100/120 (83.3)[b]	95/100 (79.2)[b]	−4.17 (−14.0 to 5.7)	0.76 (0.37 to 1.53)	0.50
Normal 2PN morphology	96/100 (96.0)[c]	86/95 (90.5)[c]	−5.47 (−13.4 to 1.84)	0.39 (0.08 to 1.49)	0.16
1PN oocytes	3/120 (2.5)[a]	6/120 (5.0)[a]	2.5 (−2.82 to 8.22)	2.05 (0.42 to 12.9)	0.50
3PN	1/120 (0.83)[a]	2/120 (1.66)[a]	0.83 (−3.09 to 5.1)	2.01 (0.10 to 119.9)	1
Degenerated oocytes post ICSI	1/120 (0.83)[a]	4/120 (3.34)[a]	2.51 (−1.75 to 7.47)	4.08 (0.39 to 203.5)	0.37
Day 2 embryo development	100/100 (100)[c]	93/95 (97.9)[c]	−2.11 (−7.3 to 1.9)	0.0 (0.00 to 0.23)	0.24
Excellent quality embryos	52/100 (52.0)[d]	49/95 (51.6)[d]	−0.43 (−14.2 to 13.3)	0.98 (0.53 to 1.79)	0.90
Good quality embryos	38/100 (38.0)[d]	41/95 (43.2)[d]	5.16 (−8.49 to 18.6)	1.24 (0.67 to 2.28)	0.47
Fair/poor quality embryos	10/100 (10.0)[d]	3/95 (3.16)[d]	−6.84 (−14.6 to 0.42)	0.29 (0.05 to 1.19)	0.10

[a]Percentage, expressed per warmed oocyte.
[b]Percentage, expressed per inseminated oocyte.
[c]Percentage, expressed per 2PN fertilized oocyte.
[d]Percentage, expressed per drawn oocyte.

Rienzi et al, 2010 - Human Reproduction

g.en.e.r.a.

Laboratory outcomes: Vitrification egg donation program

Comparison of concomitant outcome achieved with fresh and cryopreserved donor oocytes vitrified by the Cryotop method

Ana Cobo, Ph.D.,[1] Masashijar Kuwayama, Ph.D.,[2] Sonia Pérez, Ph.D.,[1] Amparo Ruiz, M.D.,[1] Antonio Pellicer, M.D.,[1] and José Remohí, M.D.[1]

[1] IVI Universidad de Valencia, Valencia, Spain, and [2] Kato Ladies Clinic, Nachinosato, Shimotsu, Tokyo, Japan

Embryo quality

	Vitrified	Fresh	*P* value
Cleavage rate day 2 embryos (%)	161/171 (94.2)	176/180 (97.8)	.082
No. of cell day 2 embryos (mean ± SD)	3.8 ± 1.1	3.9 ± 1.5	.567
Good quality day 2 embryos (%)	139/161 (84.4)	139/176 (71.5)	.009
Cleavage rate day 3 embryos (%)	125/161 (77.6)	149/178 (84.5)	.099
No. of cell day 3 embryos (mean ± SD)	6.8 ± 2.3	6.9 ± 2.7	.558
Good quality day 3 embryos (%)	101/125 (80.8)	120/149 (80.5)	.994
No. of embryos undergoing extended culture	76	143	
Blastocyst rate No. (%)	39/76 (48.7)	68/143 (47.3)	.869
Good quality blastocyte No. (%)	24/32 (81.1)	42/60 (70)	.812

g.en.e.r.a.

OUTCOMES

1. Laboratory OUTCOMES

2. Clinical OUTCOMES

g.en.e.r.a.

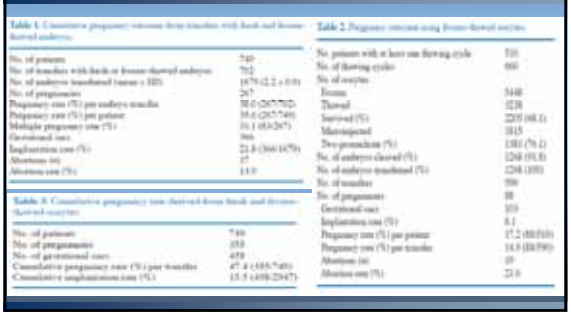
Clinical outcomes: Slow freezing infertile population

Evidence-based clinical outcome of oocyte slow cooling

Since 1992, Dr Borini has been Clinical Director of the Assisted Reproduction Centre "Tecnobios Procreazione", Bologna, Italy, and of a number of associated IVF clinics. After graduating in Medicine and Surgery at the University of Bologna, Bologna, Italy, in 1988, he completed his residency in Obstetrics and Gynaecology at the University of Bologna in 1991. He then attended the University of California Irvine, Irvine, California, as Research Fellow from October 1989 to May 1991. His research areas are embryo implantation, oocyte freezing and multiple induction of ovulation. Dr Borini has published more than 160 research papers and acts as Chairman of CECOS ITALY.

g.en.e.r.a.

Clinical outcomes: Slow freezing infertile population



g.en.e.r.a.

Clinical outcomes: Vitrification infertile population

Table II Clinical outcomes of cycles performed with vitrified/warmed oocytes

	Patients included ($N = 40$)
Number of warmed oocytes (mean ± SD)	3.1 ± 0.30
Number of embryos transferred (mean ± SD)	2.3 ± 0.88
Number of embryo transfer performed (%)	39/40 (97.5)
Clinical pregnancy rate per cycle (%)	15/40 (37.5)
Clinical pregnancy rate per transfer (%)	15/39 (38.5)
Ongoing pregnancy rate per cycle (%)	12/40 (30.0)
Ongoing pregnancy rate per transfer (%)	12/39 (30.8)
Implantation rate (%)	19/93 (20.4)
Ongoing implantation rate (%)	16/93 (17.2)

Rienzi et al, 2010- Human Reproduction

g.en.e.r.a. www.generaroma.it

Cumulative ongoing pregnancy rates: vitrification

Cumulative ongoing pregnancy rate achieved with oocyte vitrification and cleavage stage transfer without embryo selection in a standard infertility program

Journal:	Human Reproduction
Manuscript ID:	HUMREP-09-1133
Manuscript Type:	Original Articles
Keywords:	CRYOPRESERVATION, ONGOING PREGNANCY, OOCYTE, ICSI, FEMALE AGE
Specialty:	Infertility

Ubaldi et al., accepted Human Reproduction

g.en.e.r.a.

www.generaroma.it

Study design

- The study was design as a prospective longitudinal cohort study.
- The baseline characteristics, embryological data, clinical and ongoing pregnancy rate were analyzed on a per cycle basis.
- The cumulative pregnancy rate obtained with fresh and vitrified oocytes from the same stimulation cycle was analyzed on a per patient basis.

Ubaldi et al., accepted Human Reproduction

g.en.e.r.a.

www.generaroma.it

Material & methods

- All consecutives patients undergoing ICSI treatment in the Centre for Reproductive Medicine GENERA between September 2nd 2008 and May 15th 2009 were considered for this study
- Only patients with supernumerary oocytes available for cryopreservation were included. A single fresh attempt was included for each patient (special population of good responder patients).

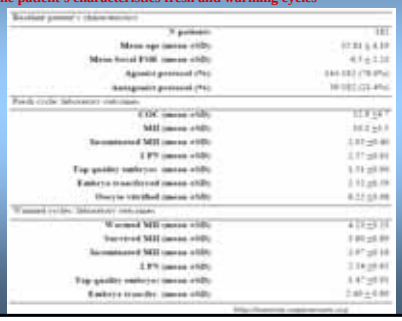
Ubaldi et al., accepted Human Reproduction

g.en.e.r.a.

www.generaroma.it

Laboratory results

Baseline patient's characteristics fresh and warming cycles



www.generaroma.it

Clinical results

Fresh and warming cycles according to female age

	Overall	≤34 years	35-37 years	38-40 years	41-43 years
Fresh cycles (thawed embryos)					
N of cycles	182	72	68	40	22
N of ET	173/182 (94.5)	69/72 (95.8)	64/68 (97.0)	40/40 (97.0)	20/21 (95.2)
Clinical Pregnancy rate per cycle	77/182 (42.3)*	33/72 (44.4)	23/68 (47.0)	13/40 (43.9)	7/21 (33.9)
Clinical Pregnancy rate per ET	77/173 (44.5)*	33/69 (48.2)	23/64 (47.8)	13/40 (47.5)	7/20 (37.0)
Implantation rate	103/435 (23.2)*	40/153 (30.0)	29/116 (25.0)*	21/112 (18.7)	5/54 (9.2)
Abortion rate	9/77 (11.7)	3/33 (9.4)	2/23 (9.0)	3/13 (18.7)	1/7 (20.0)
Ongoing pregnancy rate per fresh cycle	68/182 (37.4)*	28/72 (40.3)	20/48 (41.7)*	13/40 (34.6)	4/21 (19.0)
Ongoing Implantation rate	89/435 (20.7)*	42/153 (27.4)	24/116 (22.4)*	18/112 (16.1)	4/54 (7.4)
Thawed cycles (thawed embryos)					
N of cycles	111	57	44	20	10
N of ET	111/99 (1)	55/57 (94.6)	38/39 (96.7)	18/20 (100)	17/18 (94.4)
Clinical Pregnancy rate per cycle	35/107 (30.4)*	17/57 (49.6)	7/44 (22.1)	7/40 (23.1)	4/10 (22.2)
Clinical Pregnancy rate per ET	35/111 (31.5)*	17/55 (48.6)	7/29 (24.1)	7/40 (23.1)	4/10 (22.2)
Implantation rate	49/299 (16.1)*	21/77 (27.1)	8/74 (10.8)*	8/75 (11.0)	3/41 (11.1)
Abortion rate	8/35 (17.1)	1/17 (5.8)	0/7 (0.0)	3/7 (34.3)	1/4 (25.0)
Ongoing pregnancy rate per warmed cycle	29/107 (22.2)*	16/57 (40.2)	4/39 (10.2)*	4/40 (20.0)	3/10 (34.4)
Ongoing Implantation rate	37/299 (14.2)*	16/77 (24.7)	5/74 (6.8)*	4/75 (10.7)	3/41 (7.3)

Data are expressed as absolute, and percentage frequency
*P=0.048, χ^2 test

www.generaroma.it

Clinical results

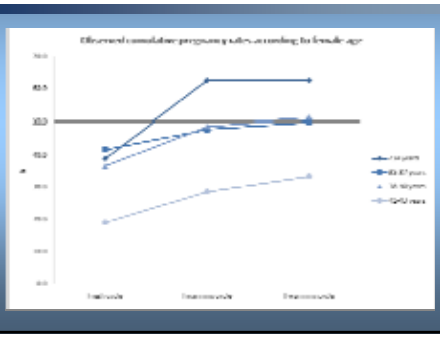
Cumulative ongoing pregnancy rates after fresh cycle, I warming and II warming cycles according to female age

	Overall	≤34 years	35-37 years	38-40 years	41-43 years
Fresh cycle	68/182 (37.4%)	28/72 (40.3%)	20/48 (41.7%)	13/41 (36.6%)	4/21 (19.0%)
(95% CI)	(31.2 to 45.1)	(29.7 to 51.9)	(28.8 to 55.8)	(23.6 to 52.0)	(7.8 to 40.3)
I warming cycle	94/182 (51.6%)	45/72 (62.5%)	23/48 (47.9%)	20/41 (48.8%)	6/21(28.6%)
(95% CI)	(44.4 to 58.8)	(50.9 to 72.8)	(34.4 to 61.7)	(34.2 to 63.6)	(13.8 to 50.2)
II warming cycle	97/182 (53.3%)	45/72 (62.5%)*	24/48 (50.0%)	21/41 (51.2%)	7/21 (33.3%)*
(95% CI)	(46.0 to 60.0)	(50.9 to 72.8)	(36.3 to 63.6)	(36.4 to 65.8)	(17.2 to 54.9)

data are expressed as absolute, percentage frequency and 95% confidence interval (95% CI)
*P=0,006, Kaplan-Meier Test

www.generaroma.it

Results



g.en.e.r.a.

www.generaroma.it

Results

Effect of patients and cycle characteristics on cumulative ongoing pregnancy rates based on Cox regression analysis

Covariate	P-value	OR	(95% CI)
Female age groups			
<34 years (reference)	-	-	-
34-37 years	0,36	0,79	0,47 to 1,31
38-40 years	0,36	0,77	0,45 to 1,33
41-43 years	0,04	0,44	0,18 to 0,64
Infertility factors			
male (reference)	-	-	-
idiopathic	0,75	0,90	0,48 to 1,67
endometriosis	0,19	0,38	0,09 to 1,60
ovulatory	0,54	0,53	0,07 to 3,91
tubal	0,81	0,93	0,52 to 1,65
combined	0,25	1,56	0,73 to 3,32
Basal FSH	0,60	0,92	0,82 to 1,23
Number of COC	0,85	1,01	0,92 to 1,09
Number of MII oocytes	0,57	1,03	0,92 to 1,14
Incubation time prior to ICSI/vitrification	0,77	1,02	0,88 to 1,17
Stimulation protocol	0,41	0,79	0,45 to 1,37
Sperm quality	0,84	1,07	0,56 to 2,03

odds ratio (OR), 95% confidence interval (95% CI)

g.en.e.r.a.

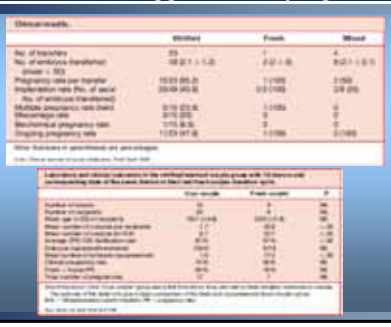
www.generaroma.it

Conclusions cumulative pregnacy

- High cumulative ongoing pregnancy rates were achieved in a standard infertility program with transfers of embryos derived from fresh and subsequently vitrified eggs
- Among various infertility factors, only female age influenced significantly the outcome
- The overall efficiency justifies the application of this strategy in routine infertility work

g.en.e.r.a.

Clinical outcomes: Vitrification egg donation program



g.en.e.r.a. www.generaroma.it

Obstetric outcomes

Chian RC, Huang JY, Tan SL, Lucena E, Saa A, Rojas A, Castellón LA, García Amador MI, Montoya Sarmiento JE.

Obstetric and perinatal outcome in 200 infants conceived from vitrified oocytes. *Reprod Biomed online 2008*

Noyes N, Porcu E, Borini A.

Over 900 oocyte cryopreservation babies born with no apparent increase in congenital anomalies. Reprod Biomed online 2009

g.en.e.r.a. www.generaroma.it

Traditional freezing and/or vitrification?

Efficiency in donation program not compromised ***(Cobo et al., 2007; Nagy et al., 2007)***

Prospective randomized study with own oocytes no difference ***(Rienzi et al., 2010)***

The clinical pregnancy rate has doubled with the introduction of vitrification ***(Tulandi et al., 2008)***

Cumulative ongoing pregnancy rate with oocyte vitrification without embryo selection in a standard infertility program ***(Ubaldi et al., 2010)***

Technical problems related to the safety of the technique has still to be solved...

g.en.e.r.a.

CONCLUSIONS

Oocyte vitrification offers new perspectives:

- oocyte cryo-banking
- fertility preservation
- equality between genders

BUT not for general population (which of course would loose the advantages of embryo selection in the fresh cycle)


g.en.e.r.a.
www.generaroma.it
CLINICA VALLE GIULIA, Roma
SALUS – ASI MEDICAL, Marostica
Ginecologia:
Filippo Ubaldi
Elena Baroni
Antonio Ciconte
Silvia Colamaria
Antonio Lo Re
Fabio Sapienza
inecologia
ndocrinologia
mbriologia
iproduzione
ssistita
Embriologia:
Laura Rienzi
Stefania Romano
Laura Albricci
Antonio Capalbo
Roberta Maggiulli
Benedetta Iussig