

THE INFLUENCE OF EJACULATORY ABSTINENCE INTERVALS ON SEMEN QUALITY - OLD CONCEPT, NEW EVIDENCES

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INTRODUCTION

- ✓ It is estimated that nearly 72.4 million couples globally experience fertility problems

Infertility: 10% of the couples

Male
factor

Others

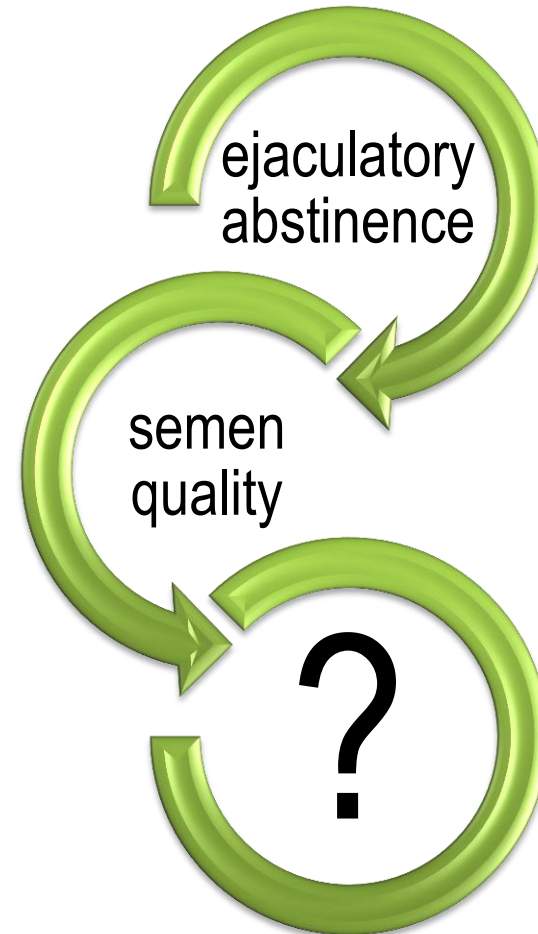
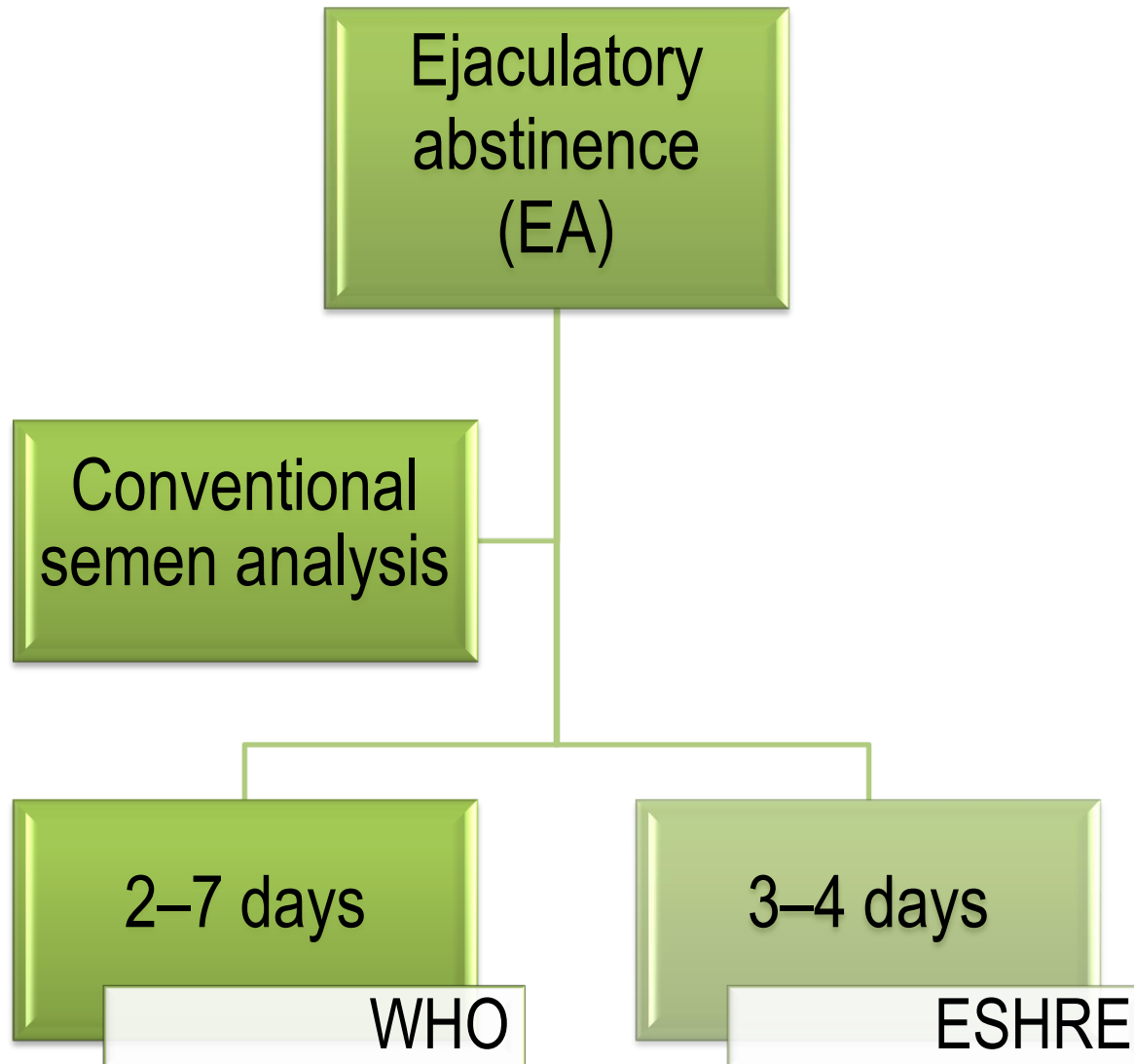
World Health Organization (WHO)

- Sperm count
- Sperm motility
- Sperm morphology

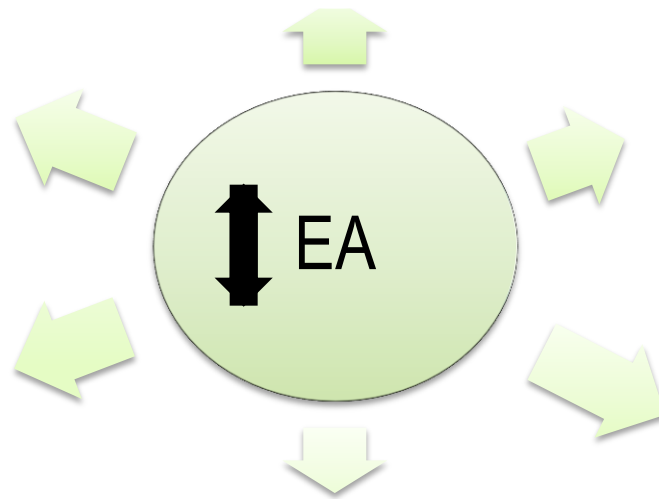
Normal

Abnormal

INTRODUCTION



INTRODUCTION

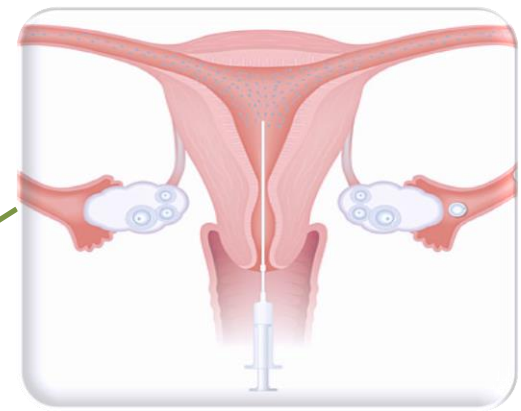


(De Jonge et al., 2004, Gosalvez et al., 2011, Sanchez-Martin et al., 2013, Agarwal et al., 2016).

INTRODUCTION

↓ EA

↑ Pregnancy



Ejaculatory
Abstinence

ICSI outcomes

Scarce studies

Limited number
of subjects

OBJECTIVE

- To investigate the influence of ejaculatory abstinence on basic and advanced semen parameters

- To investigate the influence of ejaculatory abstinence on the outcomes of ICSI

MATERIALS AND METHODS

- STUDY DESIGN

Prospective cohort
study



MATERIALS AND METHODS

• EVALUATED VARIABLES: FIRST ANALYSIS

- ✓ Semen volume
- ✓ Sperm count
- ✓ Sperm motility
- ✓ Total motile sperm count
- ✓ Morphology
- ✓ MSOME
- ✓ Sperm DNA fragmentation

• EVALUATED VARIABLES: SECOND ANALYSIS

- ✓ Fertilisation rate
- ✓ High-quality embryos rate on day 3
- ✓ Blastocyst formation rate on day 5
- ✓ Number of transferred embryos
- ✓ Implantation rate
- ✓ Pregnancy rate
- ✓ Miscarriage rate

MATERIALS AND METHODS

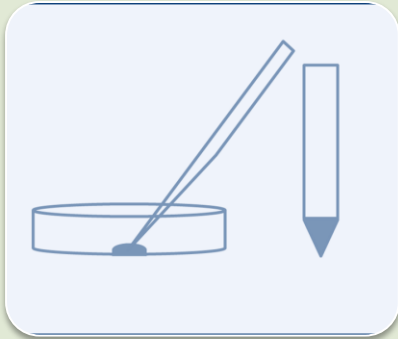


Ovarian stimulation

- rFSH
- GnRH antagonist

MATERIALS AND METHODS

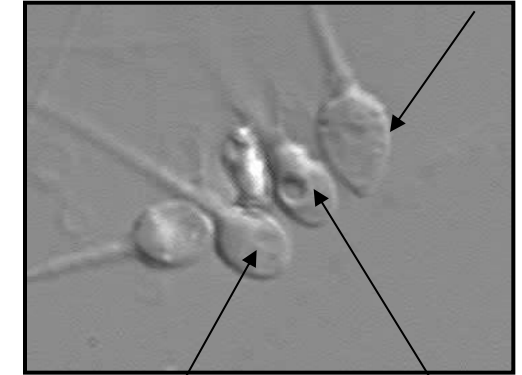
- MOTILE SPERM ORGANELLE MORPHOLOGY EXAMINATION



Aliquot of sperm cell transferred to a microdroplet of 8% PVP in a glass dish



200 sperm cells per sample analyzed under x6,600



Small vacuoles

Large vacuoles

Abnormal shape

MATERIALS AND METHODS

- MSOME: SPERM CLASSIFICATION ([Vanderzwalmen et al., 2008](#))

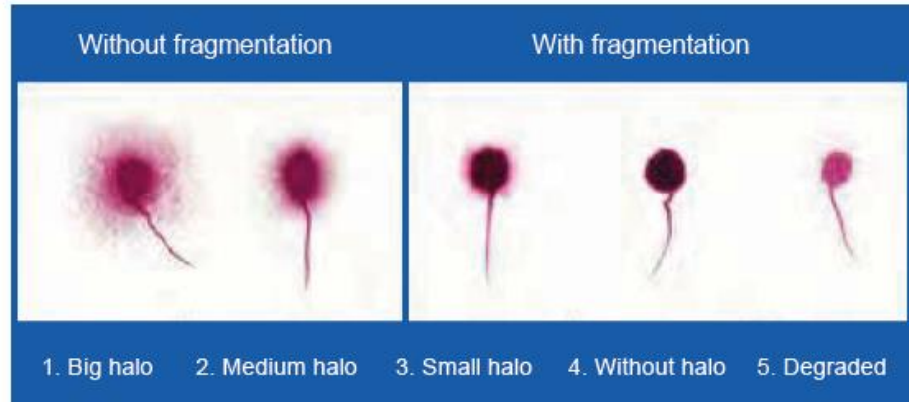
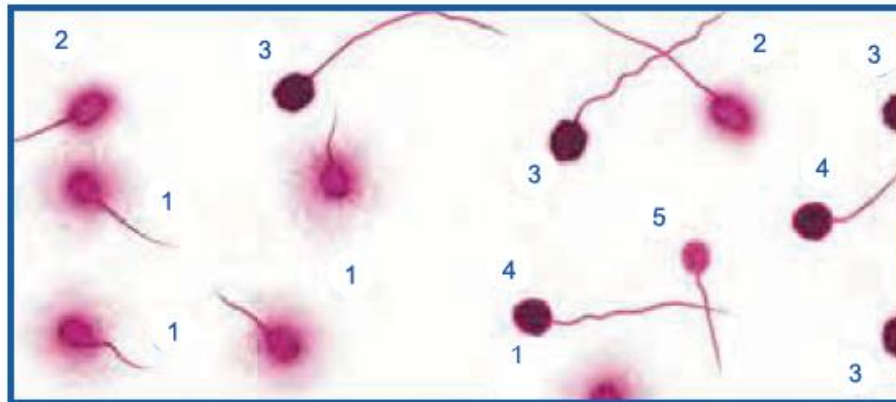
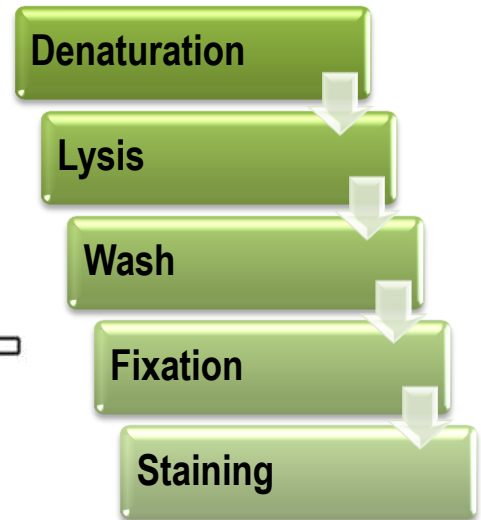
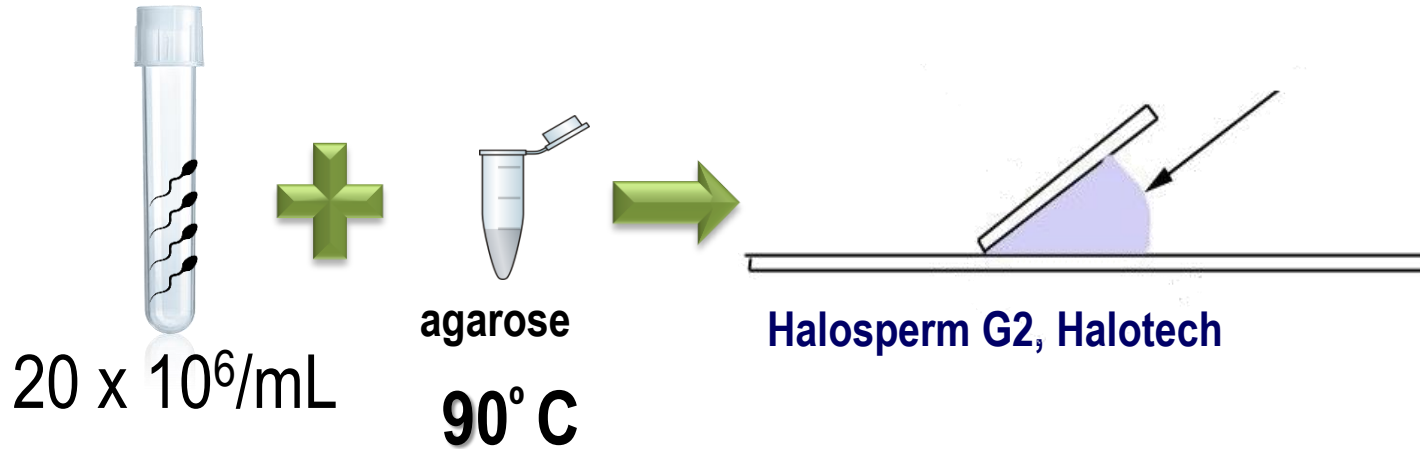


Grade I:

- Normal form
- No vacuoles

MATERIALS AND METHODS

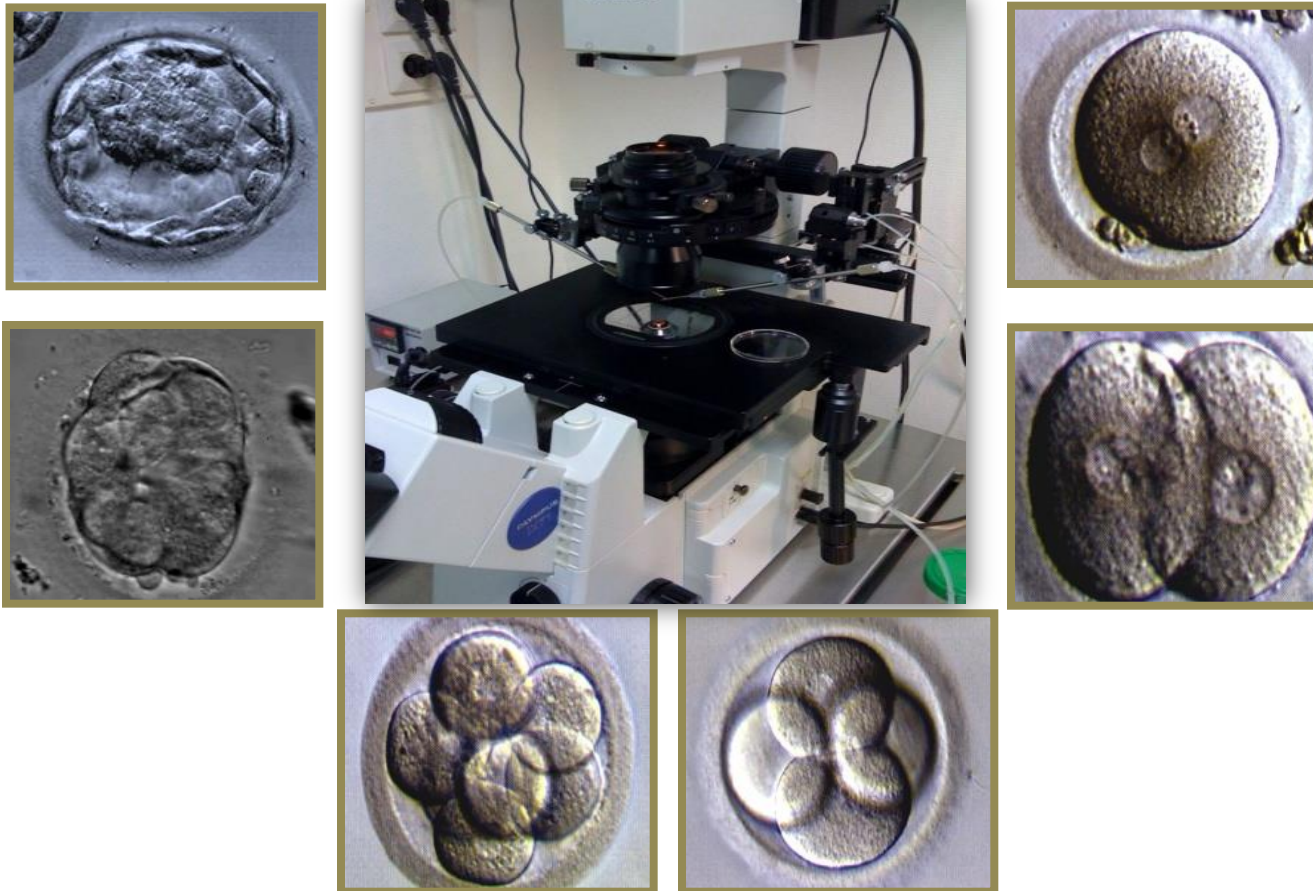
• SPERM DNA FRAGMENTATION ANALYSIS



sperm chromatin dispersion test

MATERIALS AND METHODS

- EMBRYO MORPHOLOGY AND EMBRYO TRANSFER



RESULTS

Linear model analysis of the association between sperm parameters and EA length (n = 818)

SEMEN PARAMETER	R	SLOPE	R ² (%)	P-VALUE
Semen volume (mL)	0.1405	1.62102	5.28	<0.001
Sperm count (x10 ⁶ /mL)	3.1261	52.2206	2.59	<0.001
Total sperm count (x10 ⁶)	18.941	170.650	8.37	<0.001
Total sperm motility (%)	-0.3355	19.0885	0.23	0.212
Progressive sperm motility (%)	-0.1895	19.1802	0.07	0.483
TMSC (x10 ⁶)	9.6396	102.629	6.14	<0.001
Morphology (%)	0.0227	1.29926	0.23	0.215
MSOME grade I (%)	0.03551	1.98406	0.21	0.458
MSOME grade II (%)	0.04710	4.87115	0.06	0.688
MSOME grade III (%)	-0.0057	4.22810	0.01	0.955
MSOME grade IV (%)	-1.2845	35.0110	0.87	0.129
SDF (%)	0.5355	9.34201	2.57	<0.001

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*TMSC: total motile sperm count

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*MSOME: motile sperm organelle morphology

*SDF: Sperm DNA fragmentation

RESULTS

Linear model analysis of the association between ICSI outcomes and EA length (n = 483)

VARIABLE	R	SLOPE	R ²	P-VALUE
Fertilisation rate	-0.2123	21.7045	5.25	0.029
High-quality embryos rate on day 3	-0.9810	33.0263	0.70	0.120
Blastocyst formation rate on day 5	-0.1252	29.7477	4.47	0.012
Number of transferred embryos	0.01116	0.82619 9	0.20	0.495
Implantation rate	-0.0391	31.0373	0.01	0.950
VARIABLE	OR	95% CI	P-VALUE	
Pregnancy rate	0.99	0.91-1.08	0.894	
Miscarriage rate	0.74	0.46-1.19	0.125	



RESULTS

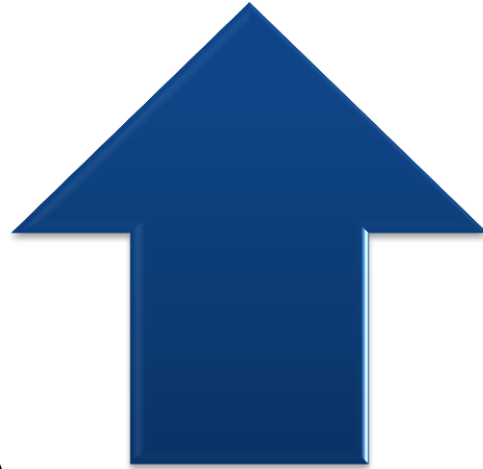
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DISCUSSION

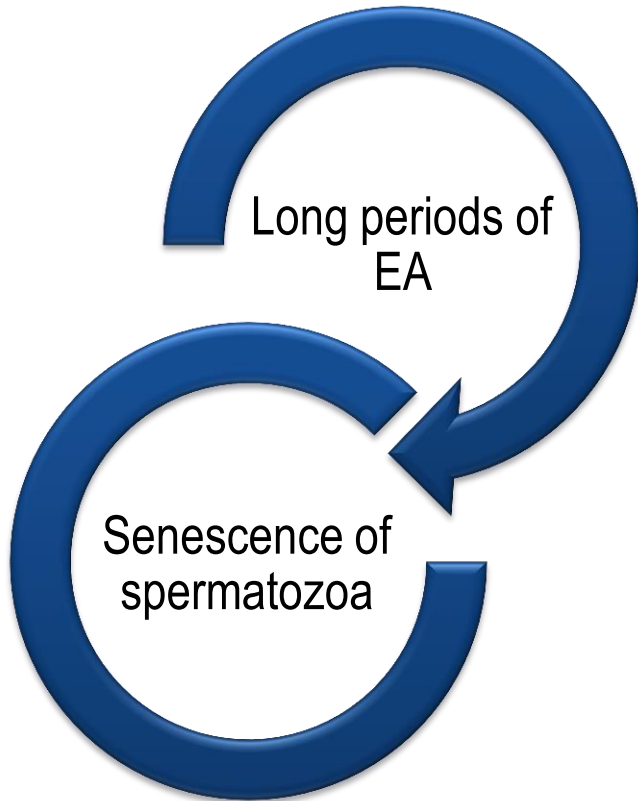
LONGER EA INTERVALS



Sperm volume
Sperm count
TMSC
SDF



DISCUSSION



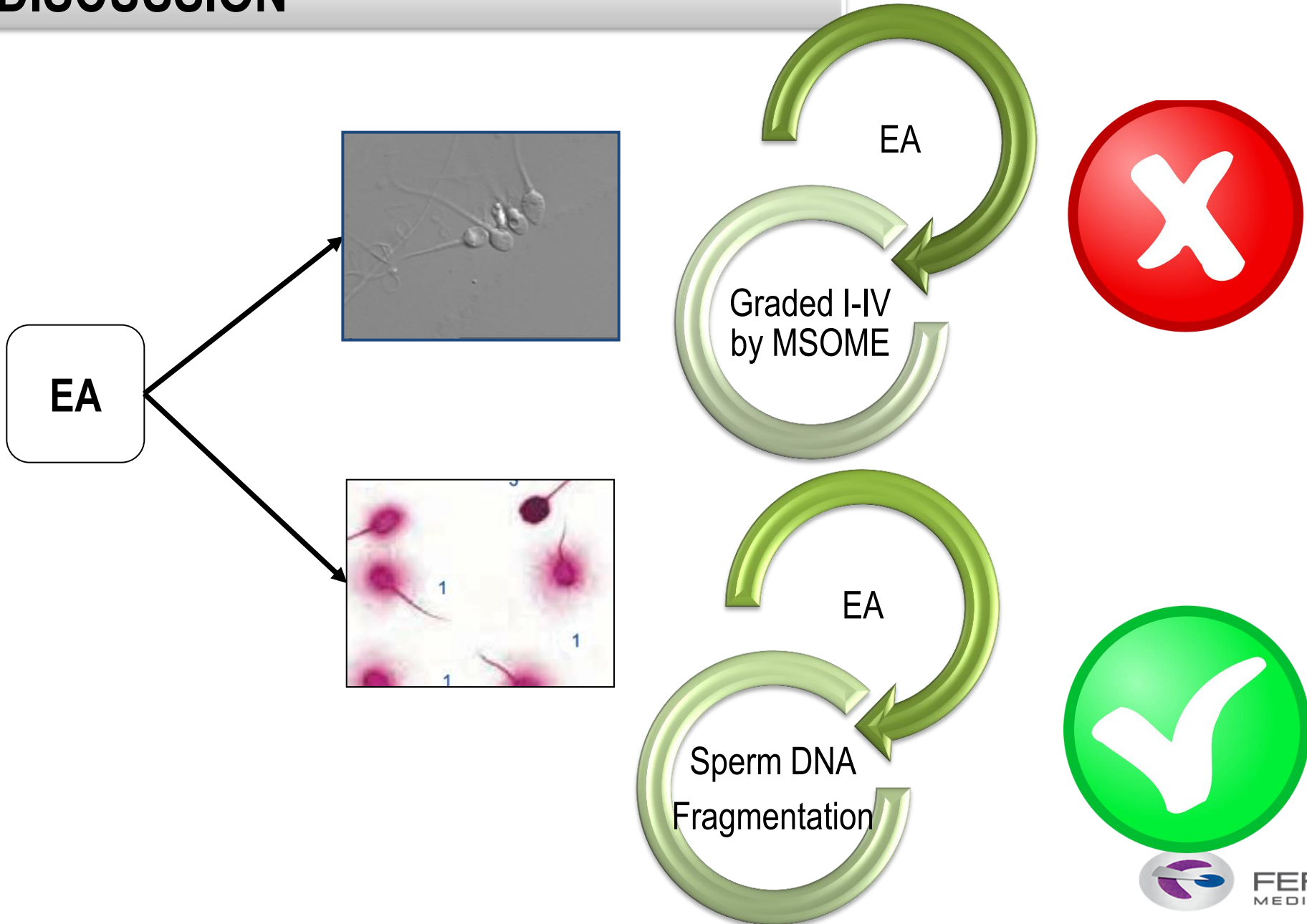
Longer EA periods

Sperm acrosin activity

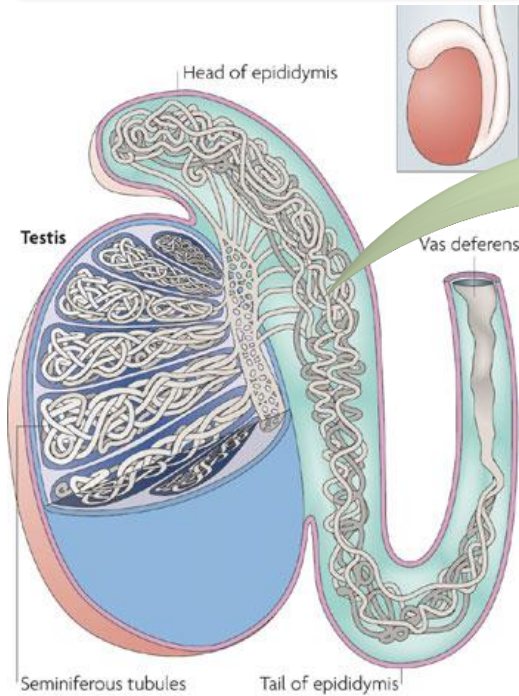
- ✓ Sperm-egg interaction,
- ✓ Sperm zona pellucida binding
- ✓ Egg penetration

(Blackwell & Zaneveld 1992)

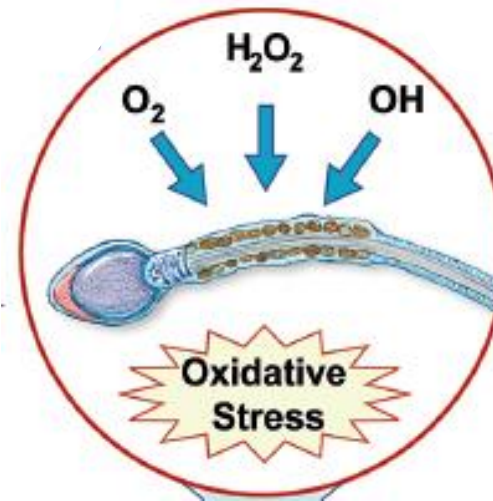
DISCUSSION



DISCUSSION



Nature Reviews | Genetics

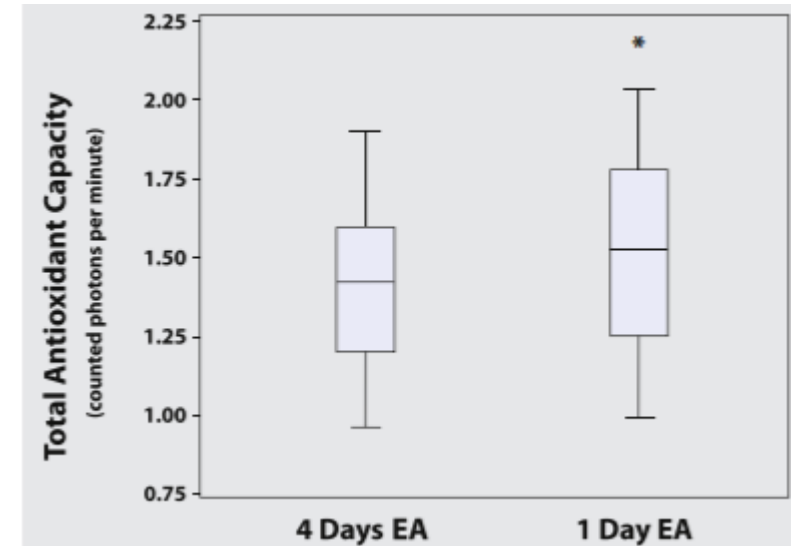


Kourouma et al., 2015

Influence of ejaculatory abstinence on seminal total antioxidant capacity and sperm membrane lipid peroxidation

Paul B. Marshburn, M.D.,^{a,b} Allie Giddings, M.D.,^b Stephanie Causby, M.S.,^{a,b} Michelle L. Matthews, M.D.,^{a,b} Rebecca S. Usadi, M.D.,^{a,b} Nury Steuerwald, Ph.D.,^c and Bradley S. Hurst, M.D.^{a,b}

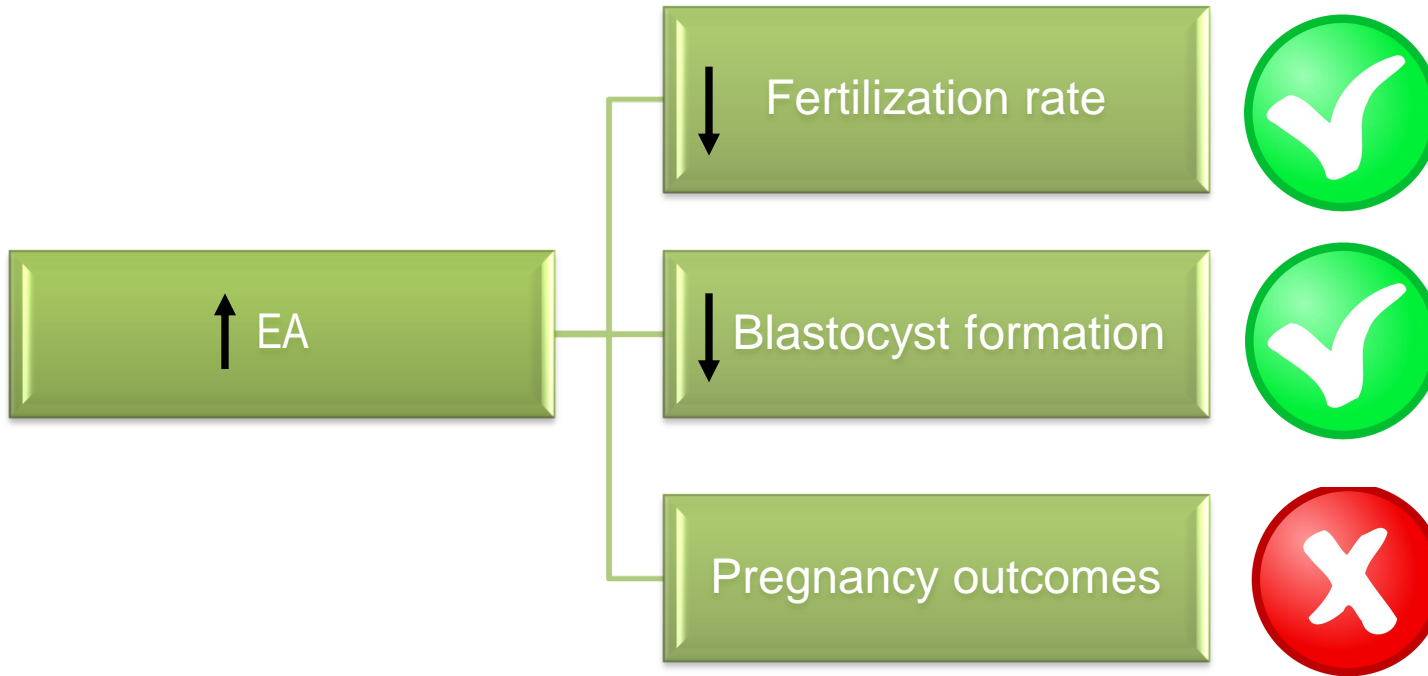
^a Division of Reproductive Endocrinology and Infertility, ^b Department of Obstetrics and Gynecology, and ^c Cannon Research Center, Carolinas Healthcare System, Charlotte, North Carolina



DISCUSSION

Excessive ROS

DISCUSSION

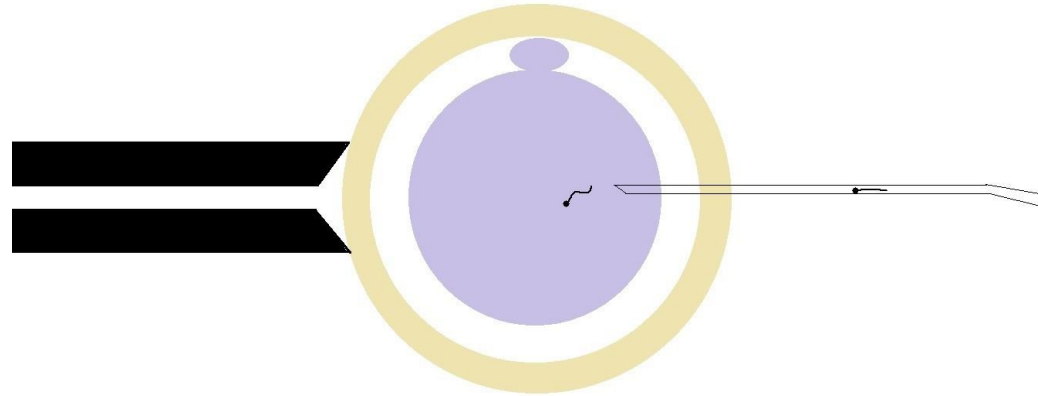


Oxidative damage

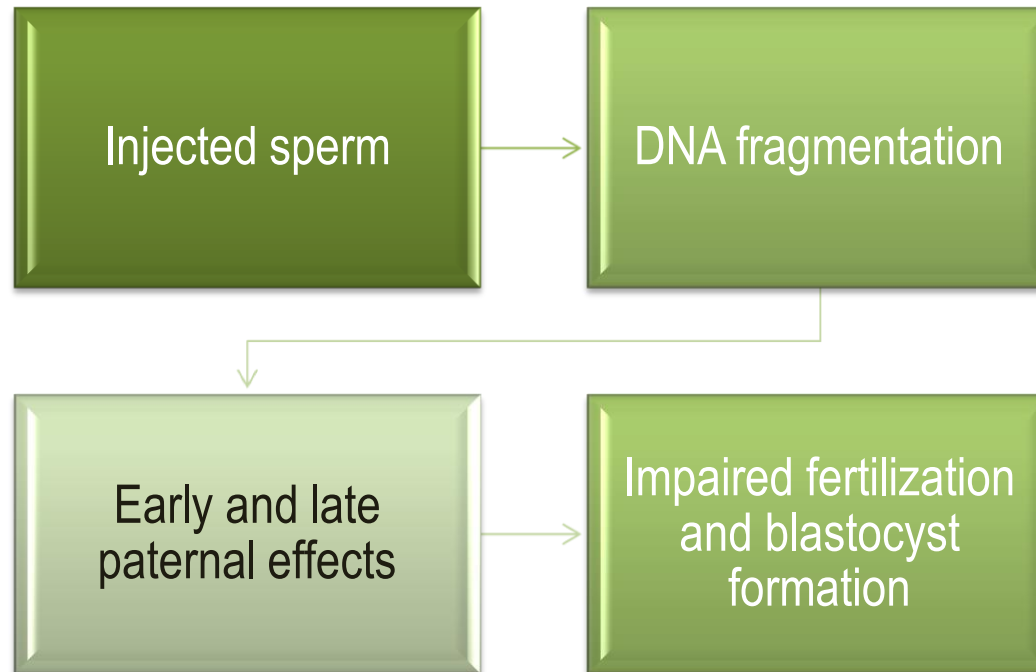


↓ Fertilization rate

DISCUSSION



- ICSI bypasses natural sperm selection

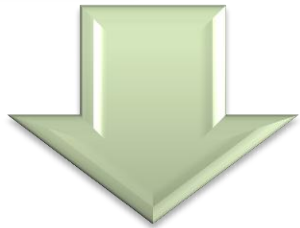


DISCUSSION

- WHO recommendation of EA for assessing conventional semen parameters (2-7 days)
- EA based on copulatory regularity
- Couples trying to conceive naturally are encouraged to have intercourse every other day during the fertile period



Detrimental effects on sperm function



Does not endanger sperm quality

CONCLUSION

- Prolonged EA periods can have a detrimental effect on both sperm function and quality
- Shortening the EA intervals could optimize sperm quality, fertilization and blastocyst formation
- Documentation that shortening the EA period would lessen these potentially harmful influences will require further study



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