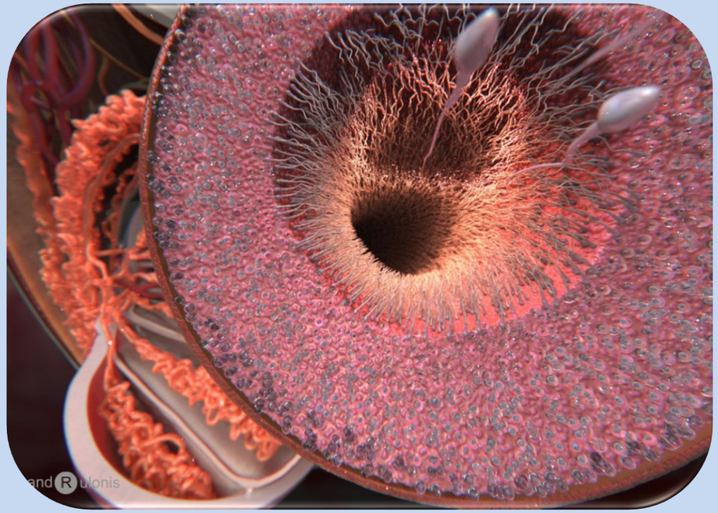
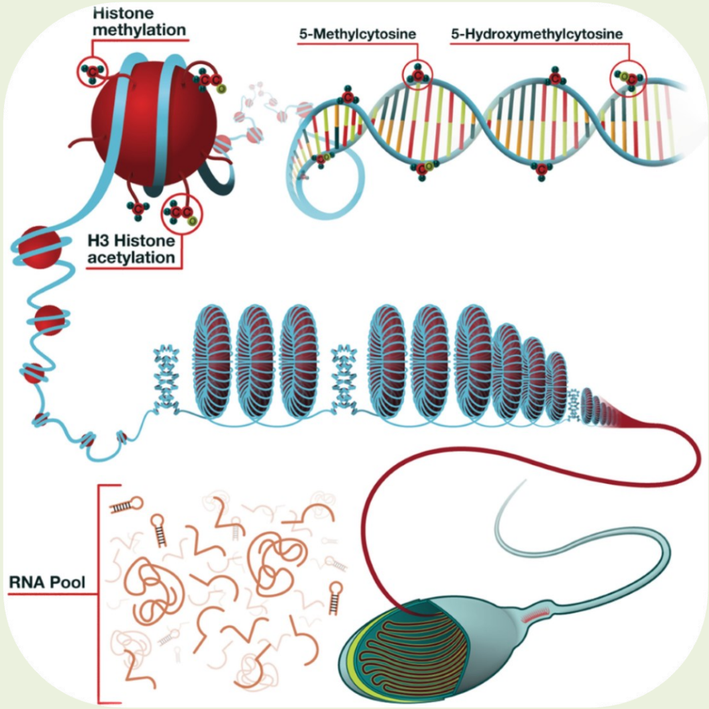
PATERNAL AGEING IMPACTS BLASTULATION AND THE OUTCOMES OF PREGNANCY AT DIFFERENT LEVELS OF MATERNAL AGE: A CLUSTERING ANALYSIS OF 21,960 INJECTED OOCYTES AND 3837 ICSI CYCLES

Amanda Setti, Daniela Paes de Almeida Ferreira Braga, Patrícia Guilherme, Livia Vingris, Assumpto Iaconelli Jr., Edson Borges Jr.

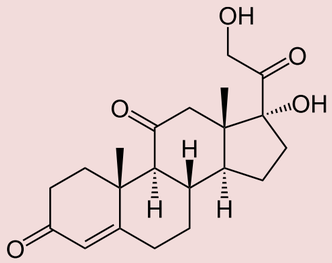
INTRODUCTION



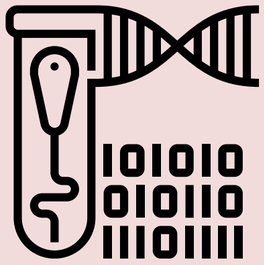
Spermatogenesis



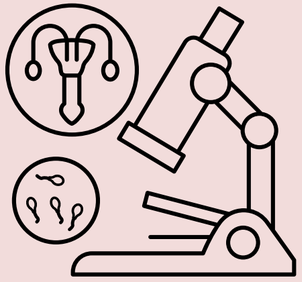
Sperm epigenome



Testosterone

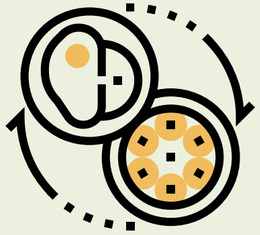


Sperm DNA



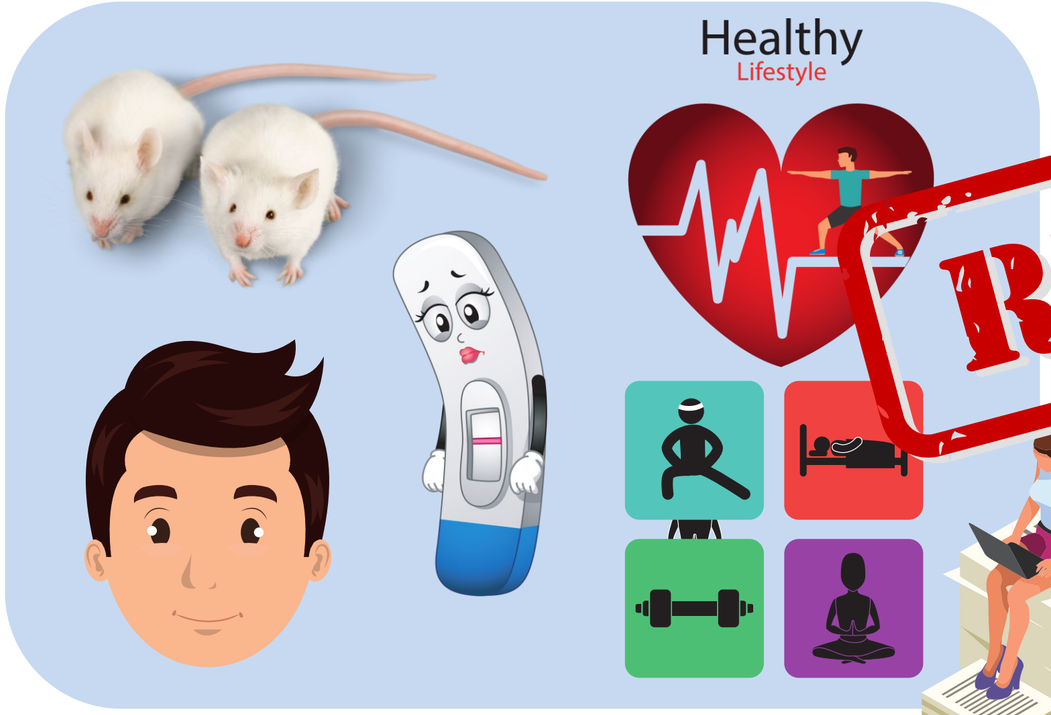
Semen quality

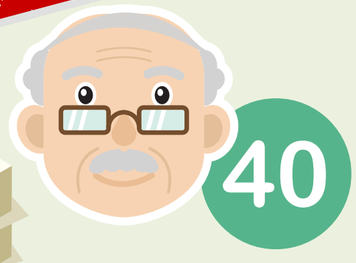
Embryo development

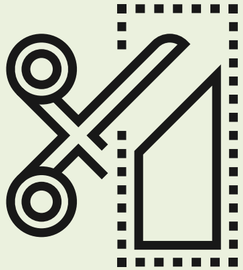


Offspring disease

INTRODUCTION







REJECTED

Comm… Hum Reprod … :17(5):13… 403. doi: 10.1093/humrep/17.5.1399.

Change… …ag… …th… …el an… duration of fertility
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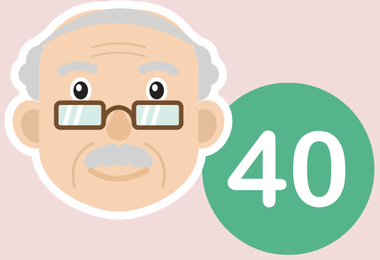
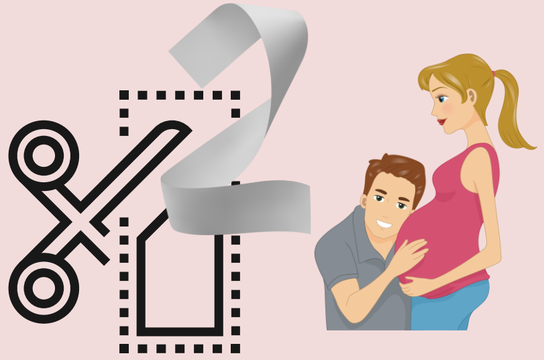
Fertil Steril. 2006 May;85(5):1420-4. doi: 10.1016/j.fertnstert.2005.11.040. Epub 2006 Apr 17.

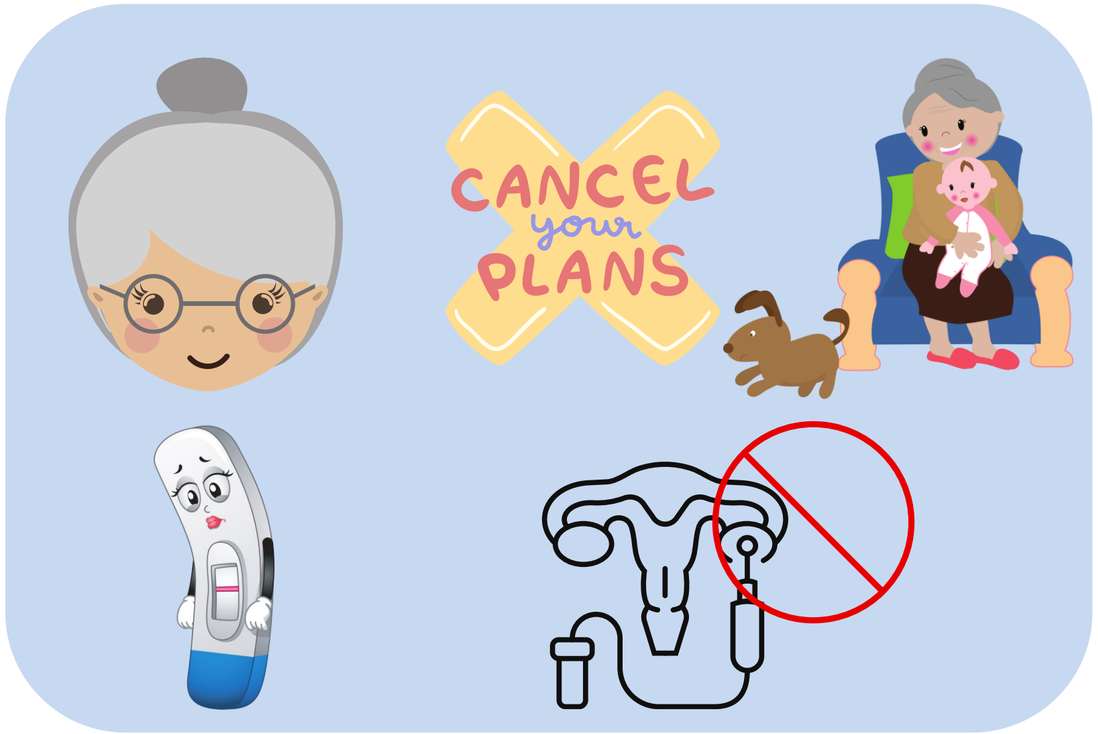
Fathers over 40 and increased failure to conceive: the lessons of in vitro fertilization in France

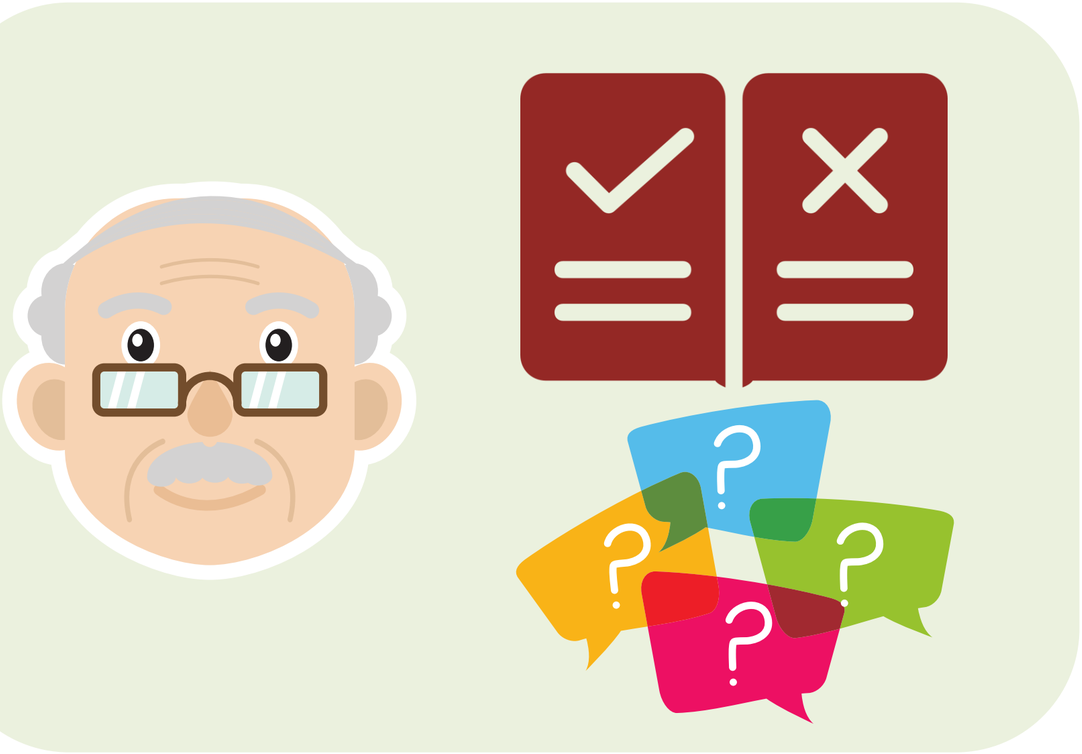
Elise de La Rochebrochard [1], Jacques de Mouzon, François Thépot, Patrick Thonneau, French National IVF Registry (FIVNAT) Association





INTRODUCTION

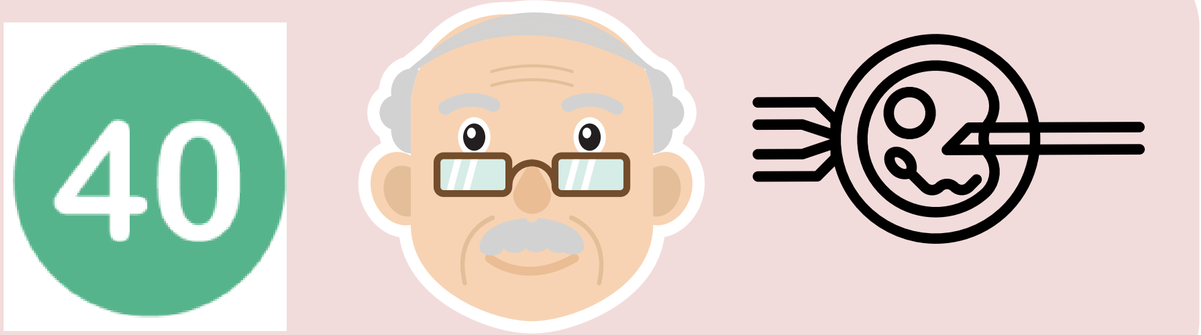




Mol Reprod Dev. 2018 Mar;85(3):271-280. doi: 10.1002/mrd.22963. Epub 2018 Mar 1.

Paternal age: Negative impact on sperm genome decays and IVF outcomes after 40 years

Ismail Kaarouch [1], Nouzha Bouamoud [1], Aicha Madkour [1], Noureddine Louanjli [2], Brahim Saadani [3], Said Assou [4], Smahane Aboulmaouahib [2], Saaid Amzazi [1], Henri Copin [5], Moncef Benkhalifa [6], Omar Sefrioui [7]



OBJECTIVE

To investigate if the effect of paternal age on embryo development and clinical outcomes differs at different values of maternal age, thus creating a rationale for the data to reach physicians, patients, and public health recommendations.

MATERIAL AND METHODS

Study design

Cross-sectional study

January 2014 – October 2020

Private university-affiliated IVF center

1st attempt

3837 ICSI couples / cycles

21960 injected oocytes

Culture until D5

Maternal and paternal ages

Embryo development
Pregnancy outcomes

MATERIAL AND METHODS

Elegibility criteria

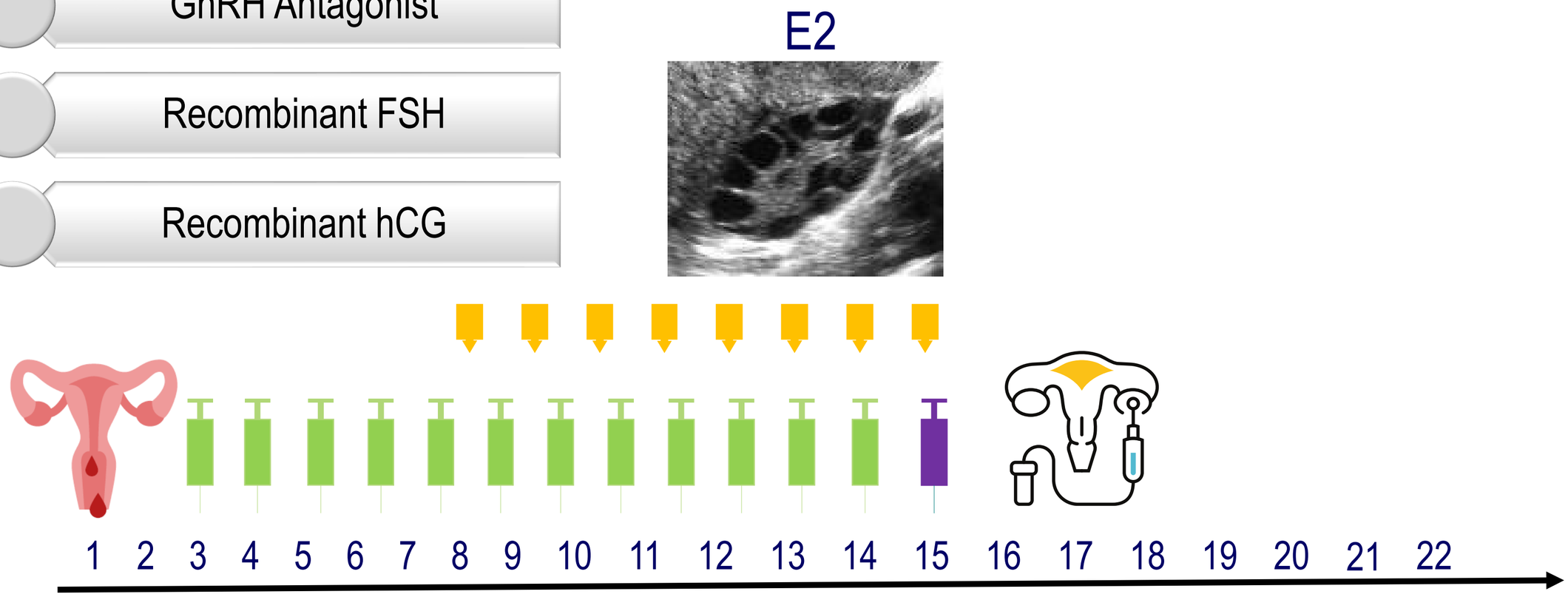
Inclusion

- [ ] Women 18-45 y-old
- [ ] Regular cycles 24-35d
- [ ] BMI 17.5-29.9
- [ ] Normal uterus / ovaries
- [ ] 1st ICSI cycle
- [ ] Female or male factor, unexplained infertility
- [ ] Fresh ejaculatd sperm
- [ ] Male ≥ 18 y-old, healthy

MATERIAL AND METHODS

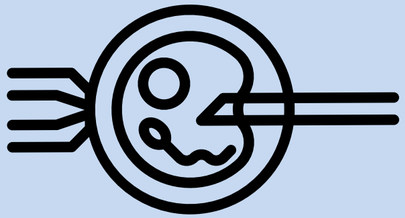
Controlled ovarian stimulation

- GnRH Antagonist
- Recombinant FSH
- Recombinant hCG



MATERIAL AND METHODS

Embryo culture



Conventional culture

16h

D5

MATERIAL AND METHODS

Data analysis and statistics

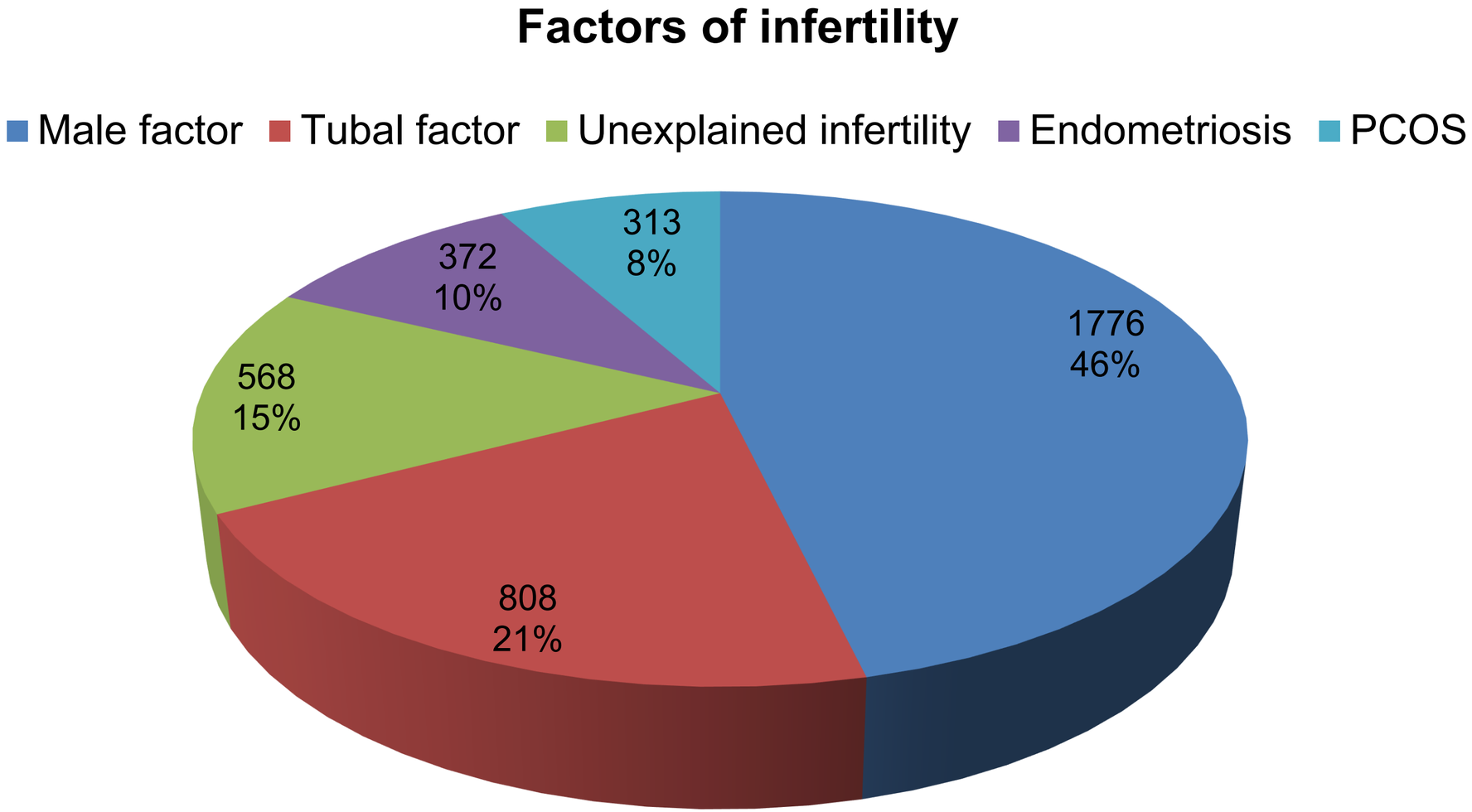
Post hoc power analysis

GPower 3.1	α 5%	IBM SPSS Statistics GMM	GzLM
21960 zygotes	3315 cycles with ET	Main effects: maternal and paternal ages (interaction term)	Single observation/couple
Effect sizes: blastulation and pregnancy		Embryo quality and blastulation	Pregnancy outcomes
Superior to 99%			

Random effect – correlation between embryos within the same cycle

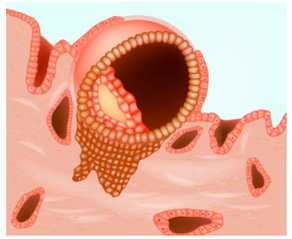
Regression coefficient (B)	OR with 95% CI	p-values (5%)

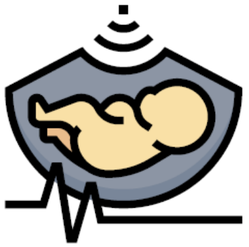
RESULTS


Factors of infertility
Male factor
Tubal factor
Unexplained infertility
Endometriosis
PCOS
1776
46%
808
21%
568
15%
372
10%
313
8%

RESULTS

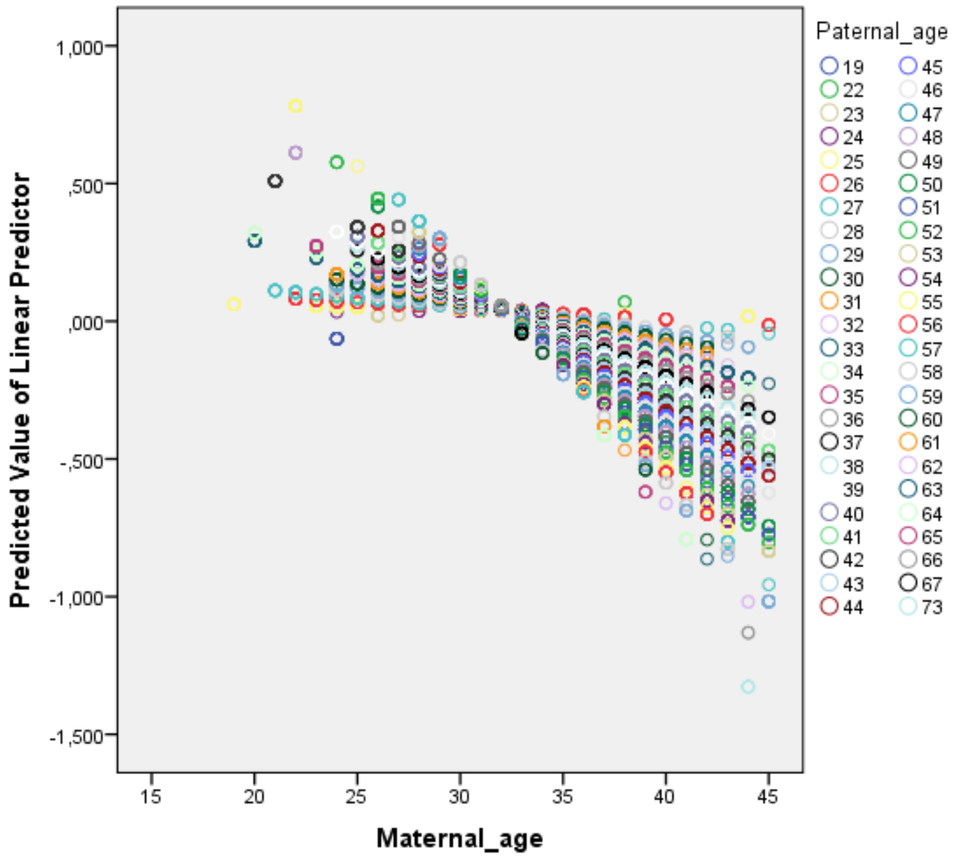
Variable	Value (n=3837)
Female age (y-old)	35.3 ± 4.5
Female BMI	24.2 ± 3.9
Male age (y-old)	38.0 ± 6.4





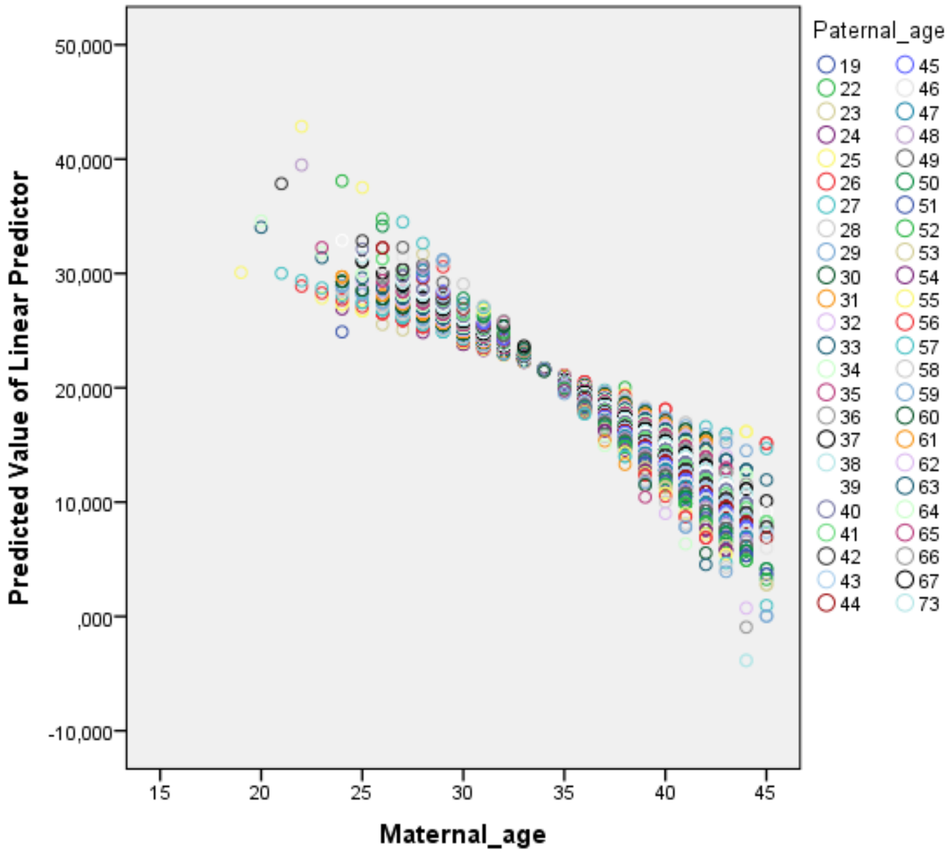
RESULTS

Dependent variable	B	OR	CI	p-value
Blastocyst development	- 0.005	0.995	0.994 – 0.996	< 0.001



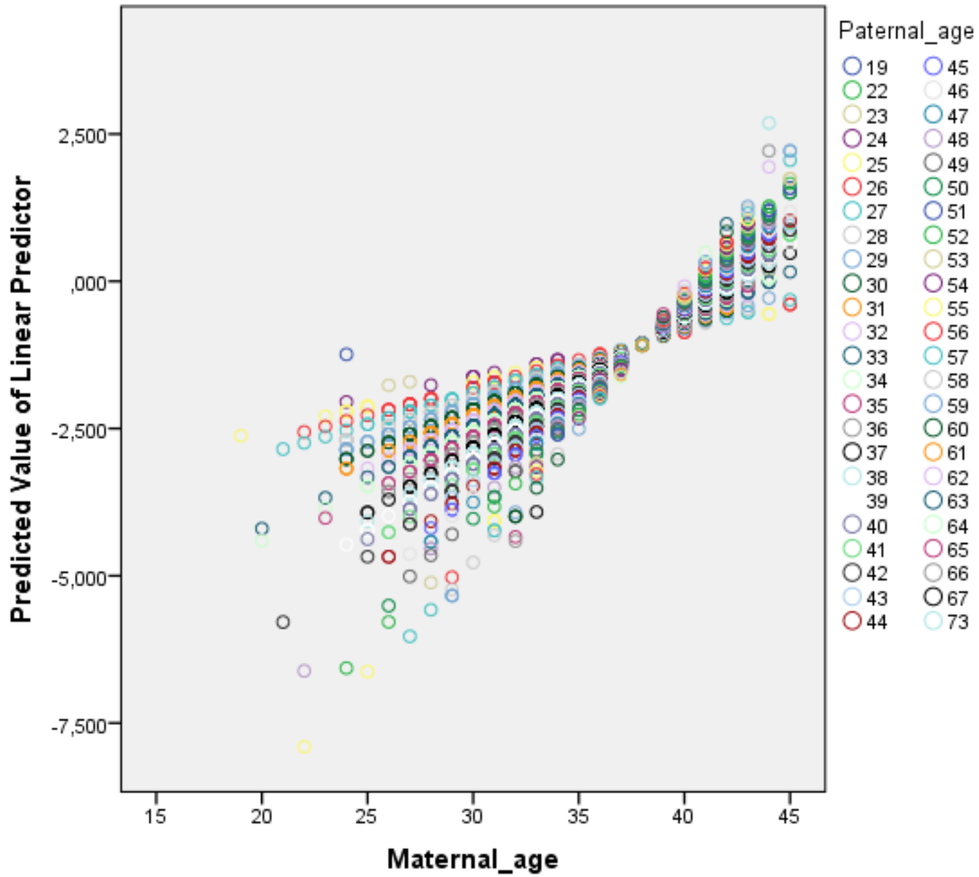
RESULTS

Dependent variable	B	OR	CI	p-value
Implantation rate	- 0.041	0.960	0.947 – 0.973	< 0.001



RESULTS

Dependent variable	B	OR	CI	p-value
Miscarriage rate	0.011	1.012	1.005 – 1.018	0.001



CONCLUSION

The slopes of maternal age on blastulation, blastocyst quality, and implantation, pregnancy and miscarriage rates significantly changed (worsened) for every year increase in paternal age.

There are ongoing pregnancies, but available data indicate the same trend for live-birth rate.

WIDER IMPLICATIONS OF THE FINDINGS

Our results underscore the importance of both maternal and paternal ages for blastulation and successful pregnancy.

Main effects of paternal and maternal ages should no longer be interpreted as the relationship between each independent variable and a given outcome, but rather be conditional on the values of the interaction term.

REVISED

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