27º CBRA
CONGRESSO BRASILEIRO DE REPRODUÇÃO ASSISTIDA

FATOR MASCULINO GRAVE: IMPACTO NOS EMBRIÕES E NOS RESULTADOS

Edson Borges Jr.

Fertility Medical Group
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Declaração

Sem conflito de interesse para divulgar relacionado ao assunto desta palestra

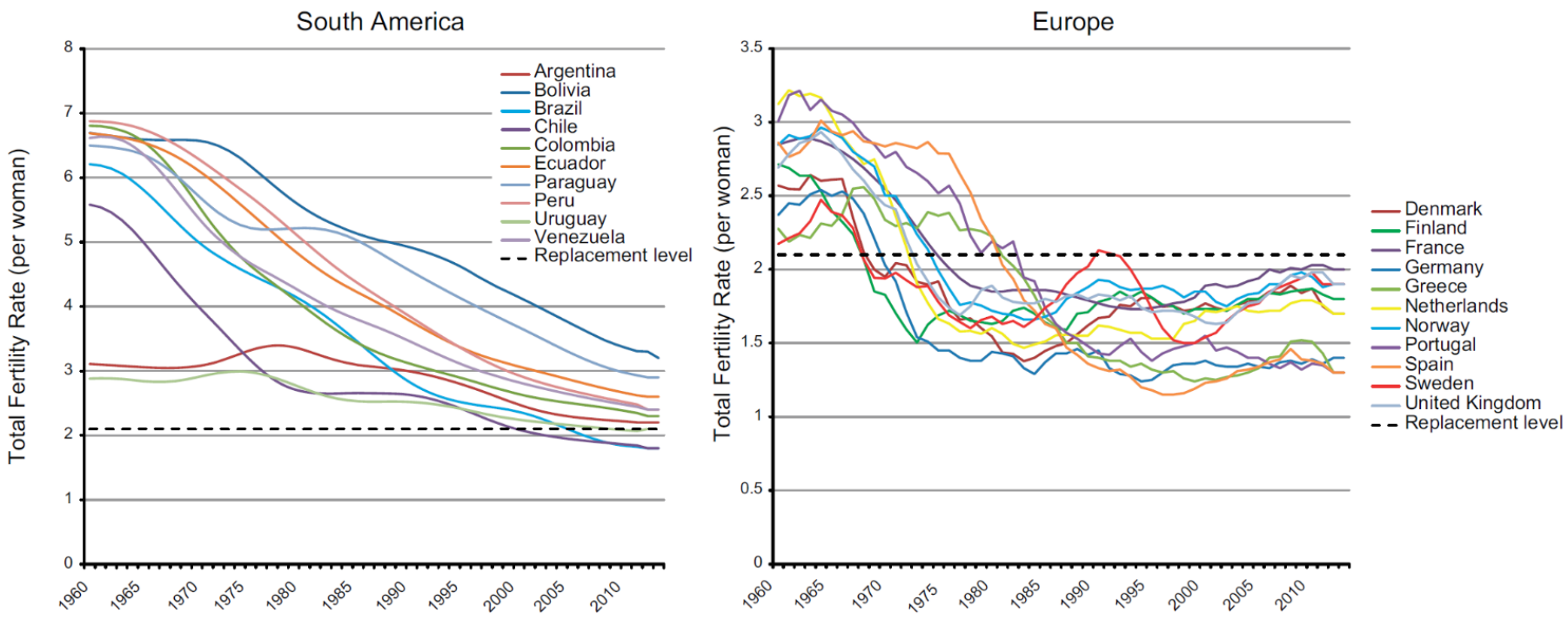
Resolução do Conselho Federal de Medicina
nº 1.595/2.000

Physiol Rev 96: 55–97, 2016
Published November 18, 2015; doi:10.1152/physrev.00017.2015

MALE REPRODUCTIVE DISORDERS AND FERTILITY TRENDS: INFLUENCES OF ENVIRONMENT AND GENETIC SUSCEPTIBILITY

Niels E. Skakkebaek, Ewa Rajpert-De Meyts, Germaine M. Buck Louis, Jorma Toppari, Anna-Maria Andersson, Michael L. Eisenberg, Tina Kold Jensen, Niels Jørgensen, Shanna H. Swan, Katherine J. Sapra, Søren Ziebe, Lærke Priskorn, and Anders Juul

Taxa de Fecundidade



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Incidência de Criptorquidia

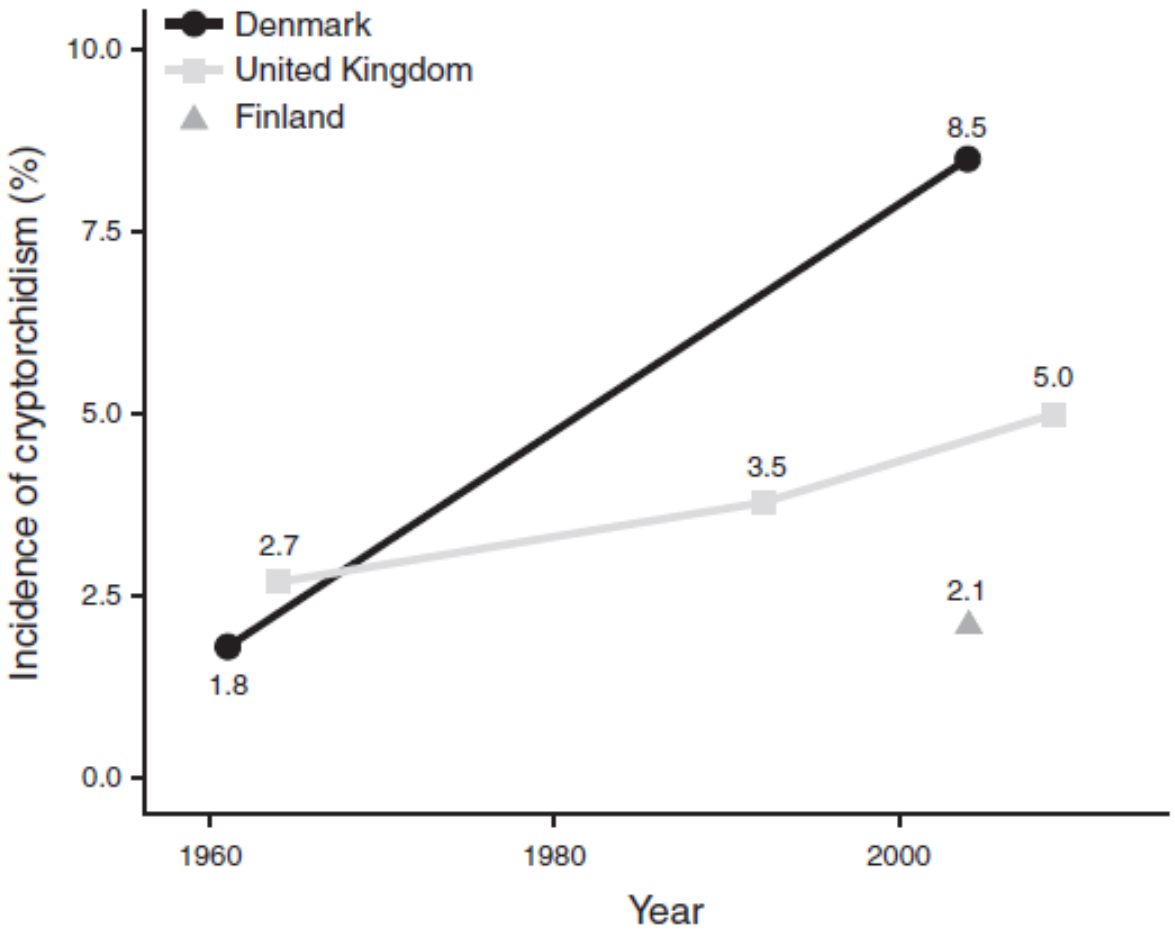

FIGURE 7. Incidence of cryptorchidism at birth on the basis of prospective clinical studies from the 1950s to the 2000s in Denmark, Finland, and United Kingdom. The data points are marked on the year of the publication of the study which represents the preceding incidence rate (3, 47, 61, 184, 377).

Idade da Puberdade

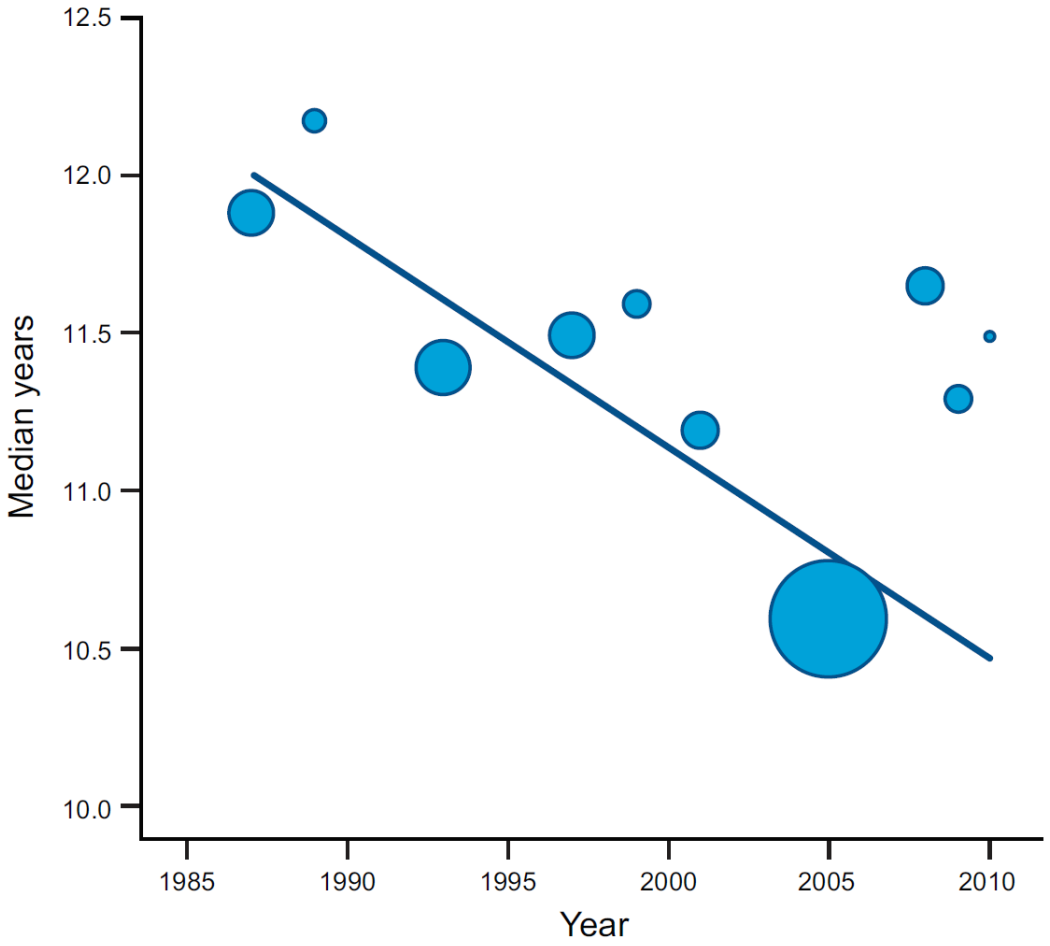

FIGURE 8. Recent changes in male pubertal timing. Testicular volume was >3 ml. [From Mouritsen et al. (293).]

Incidência de Câncer de Testículo

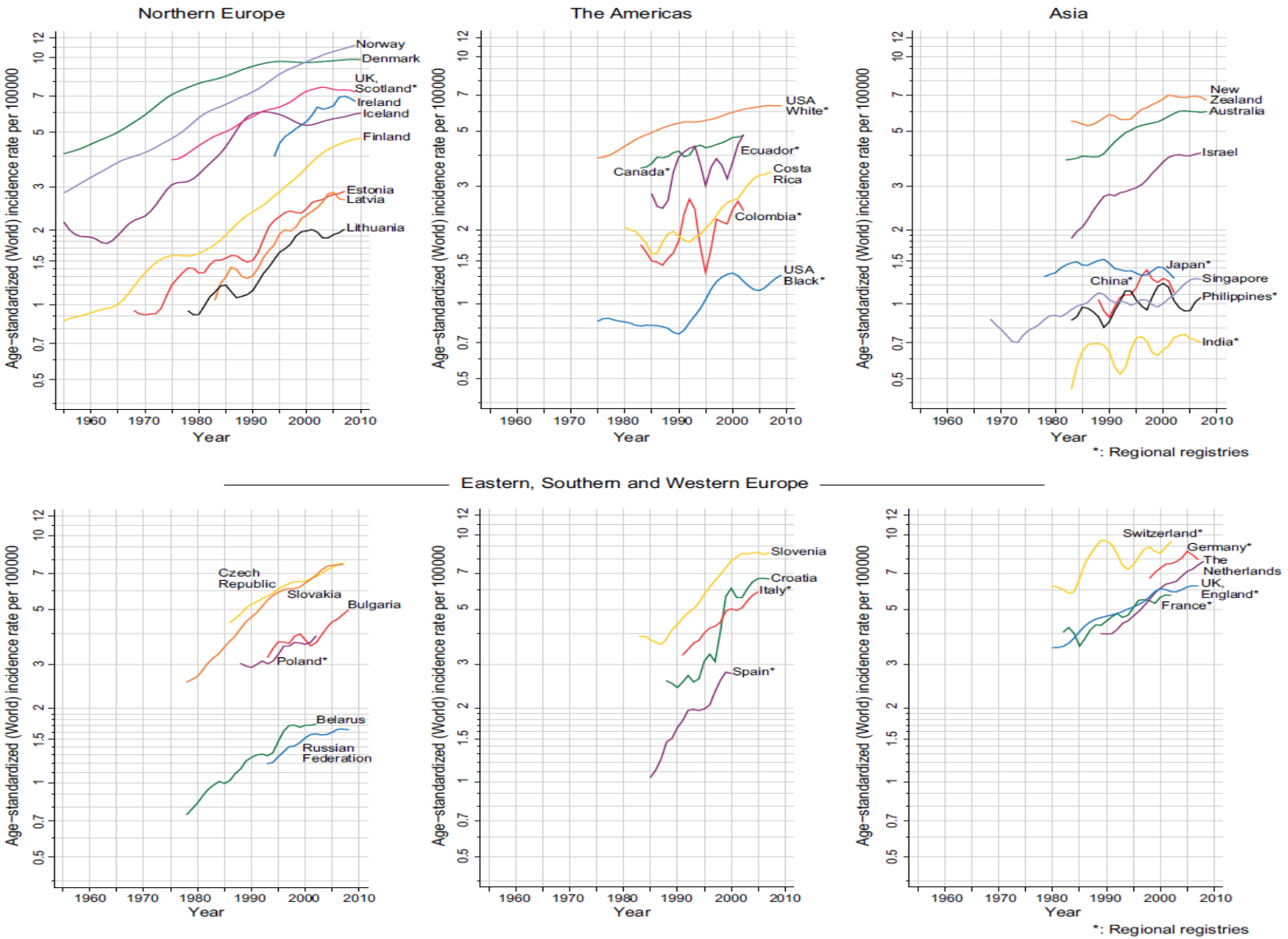

FIGURE 4. Trends in testicular cancer; age-standardized (world) incidence (regional or national), all ages. [Modified from Znaor et al. (481). Courtesy of Dr. Arinana Znaor and statistician Mathieu Laversanne, M.Sc., WHO, International Agency for Research in Cancer (IARC), Lyon, France.]

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Article

HET

Human and Experimental Toxicology
1–9
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DOI: 10.1177/0960327117703690
journals.sagepub.com/home/het
SAGE

Decline in sperm count in European men during the past 50 years

P Sengupta[1,2], E Borges Jr[3], S Dutta[4] and E Krajewska-Kulak[2]

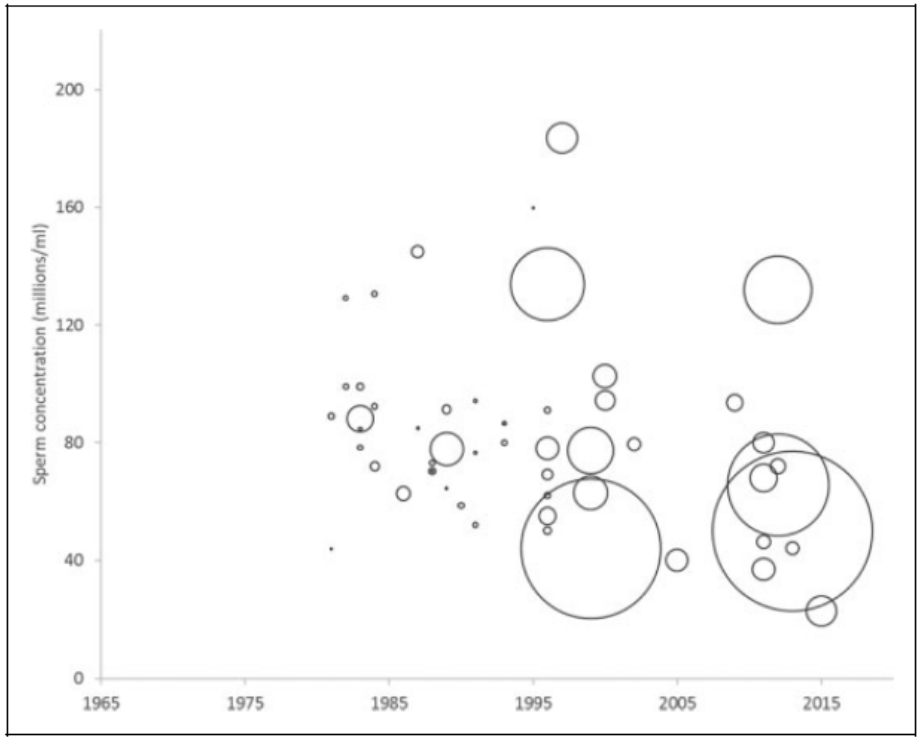

Figure 1. Temporal decline in sperm concentration ($\times 10^6$/ml) from 1965 to 2015, bubble size corresponds to the number of men in the study.

A time dependent decline in sperm concentration was observed from 1965 to 2015 (r=0.307, p=0.02)

An overall 32.5% decrease in mean sperm concentration

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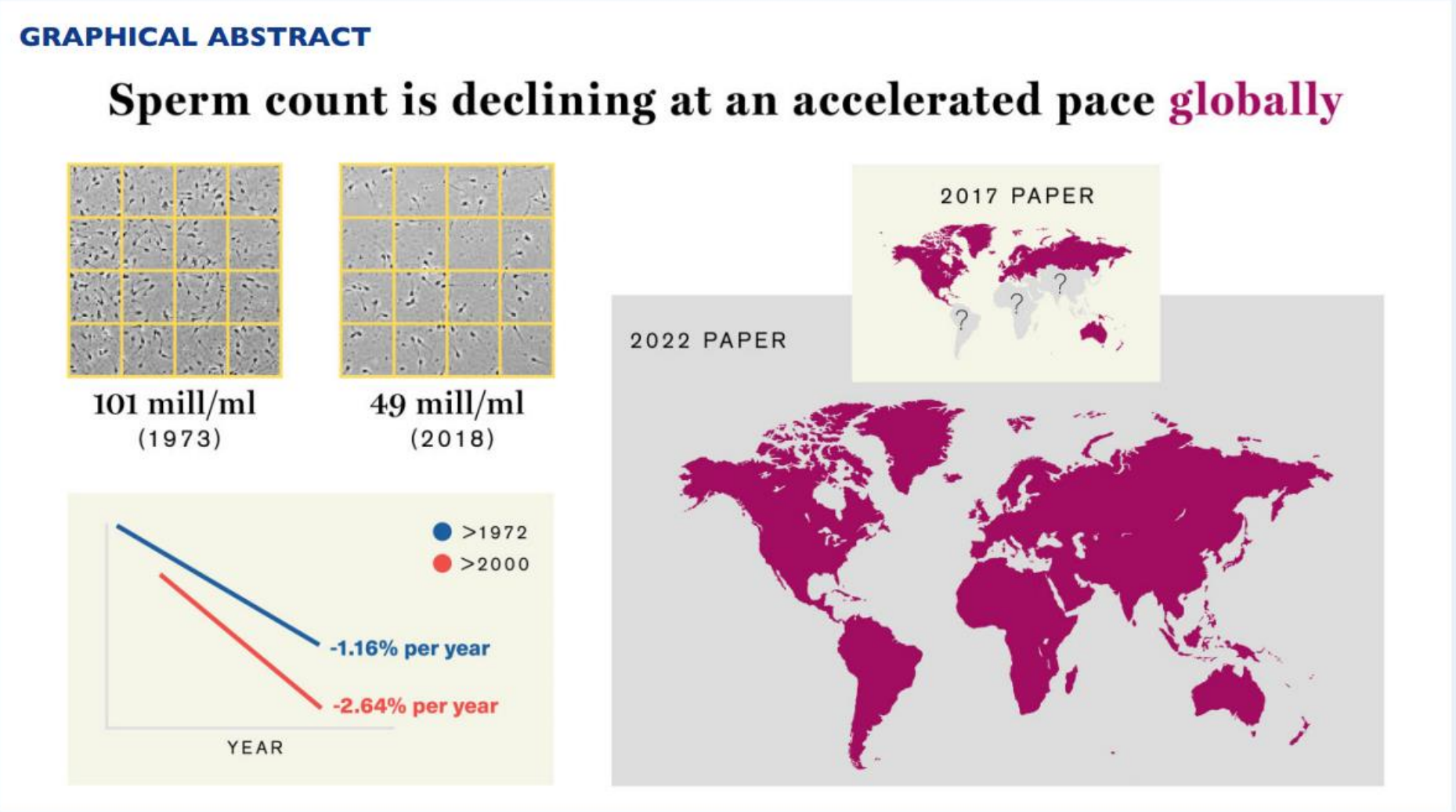
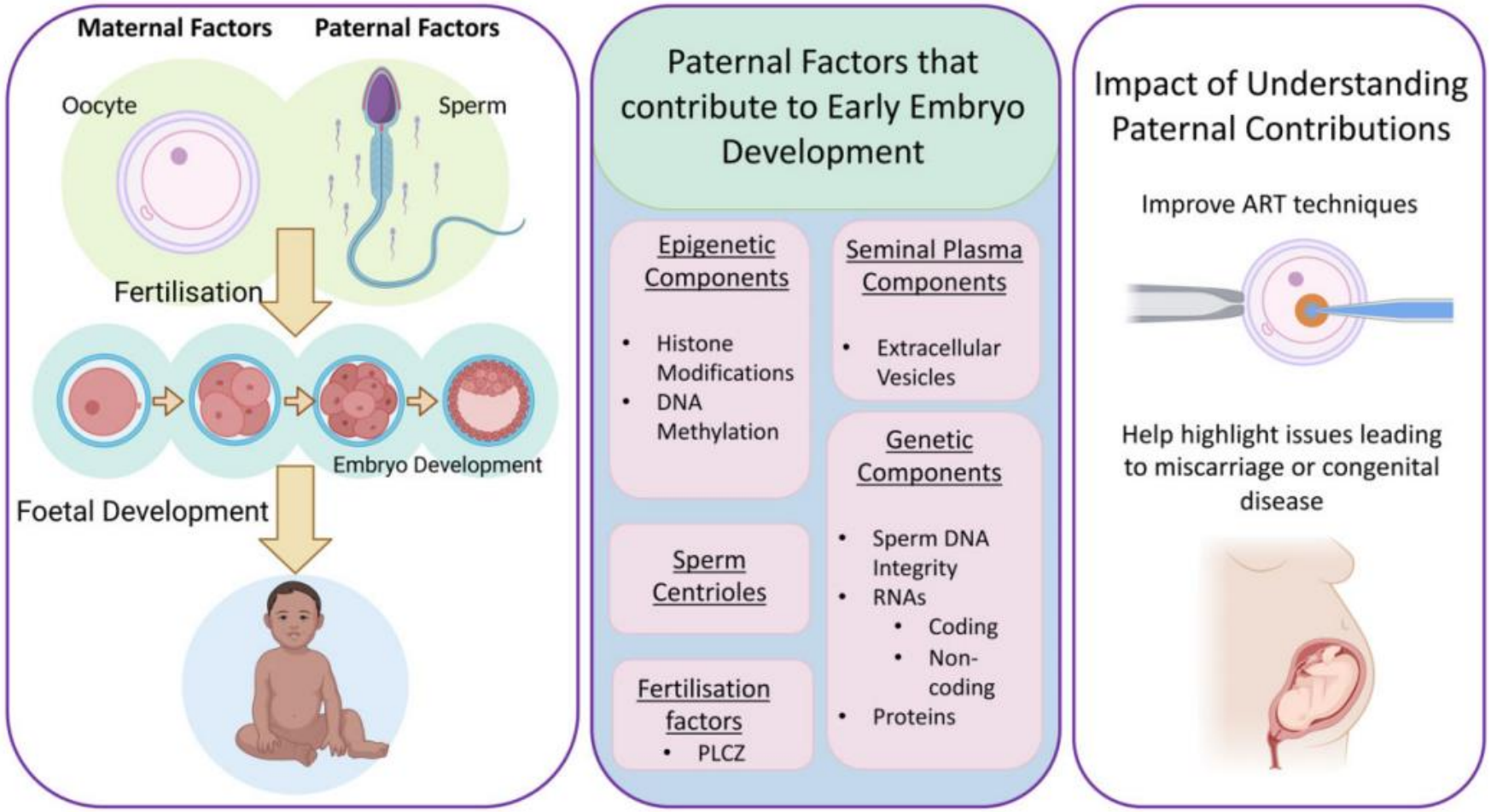
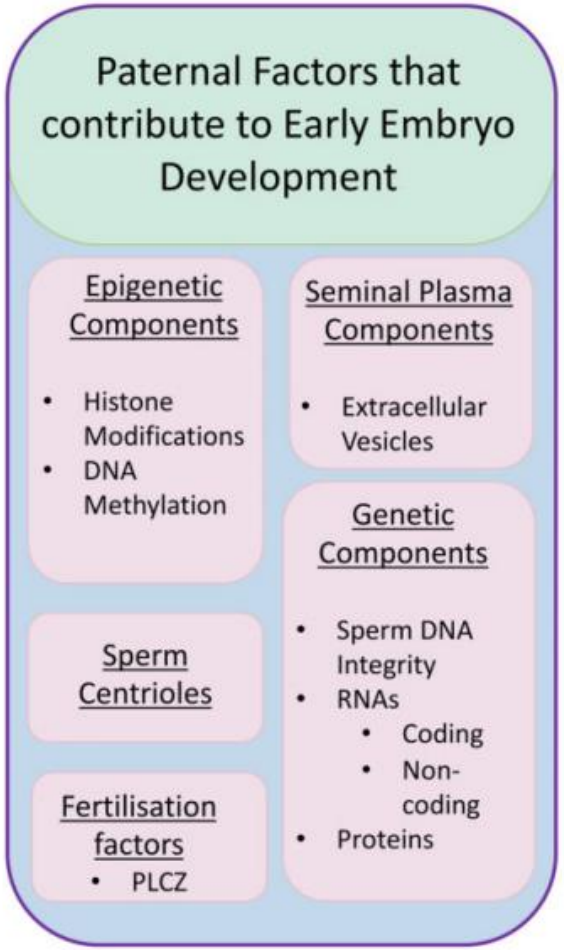


Sperm count is declining at an accelerated pace globally.

Human Reproduction Update, Vol.29, No.2, pp. 157–176, 2023
Advance Access Publication on November 15, 2022 https://doi.org/10.1093/humupd/dmac035



Human Reproduction Update, Vol.29, No.4, pp. 395–433, 2023



Human Reproduction Update, Vol.29, No.4, pp. 395–433, 2023

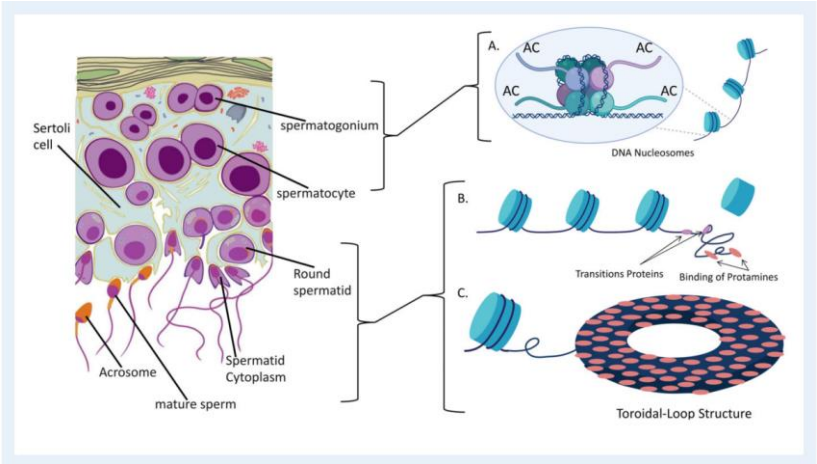
Contribuição do SÊMEN na fertilização e divisão embrionária

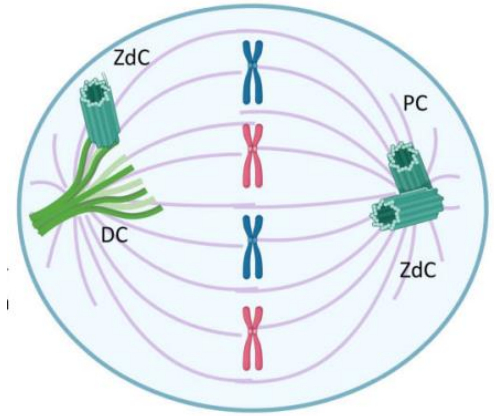
- ***Plasma seminal - vesículas extracelulares:*** epididimossomos e prostatossomos, com influência na gametogênese, fertilização, embriogênese e receptividade endometrial

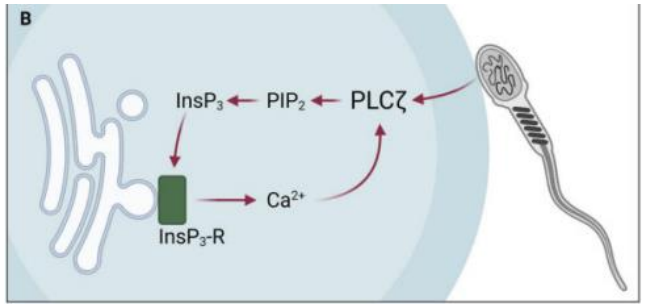
- ***Espermatogênese:*** material genético e influência epigenética (histonas/protaminas)

- ***Centríolos***: divisão embrionária

- ***Fertilização:*** PLC zeta







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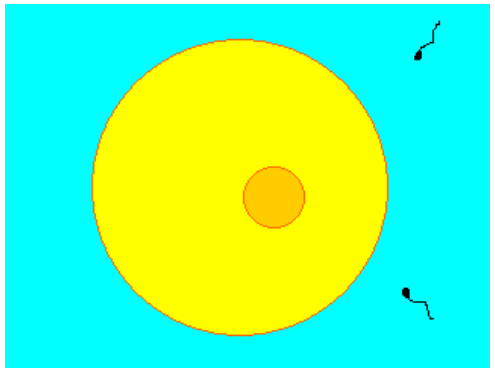
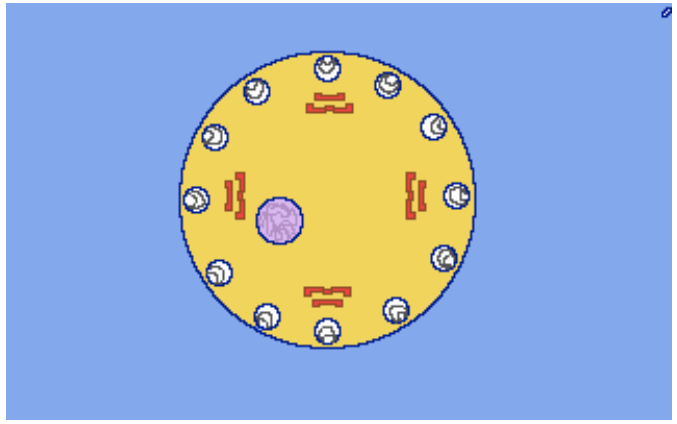
Mecanismos do “efeito paterno” no desenvolvimento embrionário pré-implantacional



EFEITO PATERNO PRECOCE:

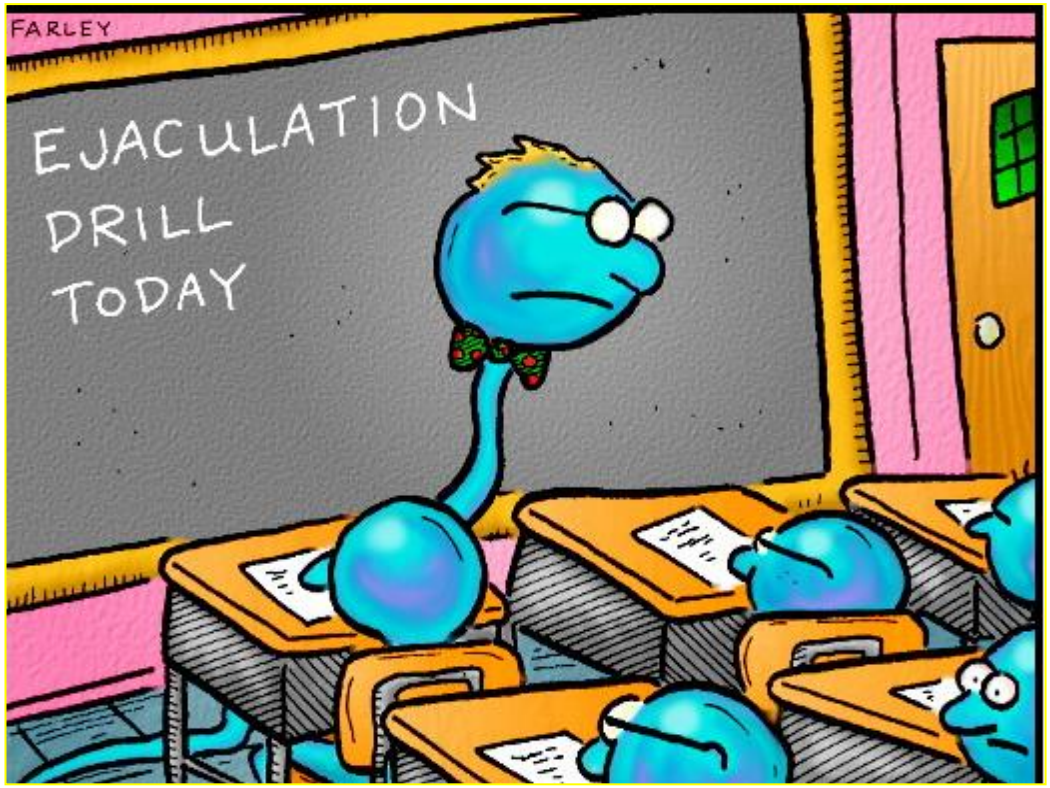
- anormalidades do centríolo e da ativação ovocitária
- fecundação e divisão embrionária inicial

Mecanismos do “efeito paterno” no desenvolvimento embrionário pré-implantacional



EFEITO PATERNO TARDIO:

- relacionado com a fragmentação do DNA espermático
- divisão embrionária tardia
- implantação
- desenvolvimento embrionário / fetal



Qualidade do Espermatozoide
X
Chances de Sucesso

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Qualidade seminal e resultados de T.R.A.

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Z.P. Nagy, J. Liu, H. Joris, G. Verheye

Human Reproduction, Volume 10, Is
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Ragaa T. M
Mohamed A. Abou
Gamal I. Serour, M.D.*§

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Consequências da Alteração Espermática

- menores taxas d
- desenvolvimento
- maiores taxas d
- piores condiçõe
- maior incidência
- maiores taxas d

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Slama et al, 2005, Nybo A 2005, Nieschlag et al, 2004, Tesarik et al, 2006, Wyrobek et al, 2006, et al, 2008 ...

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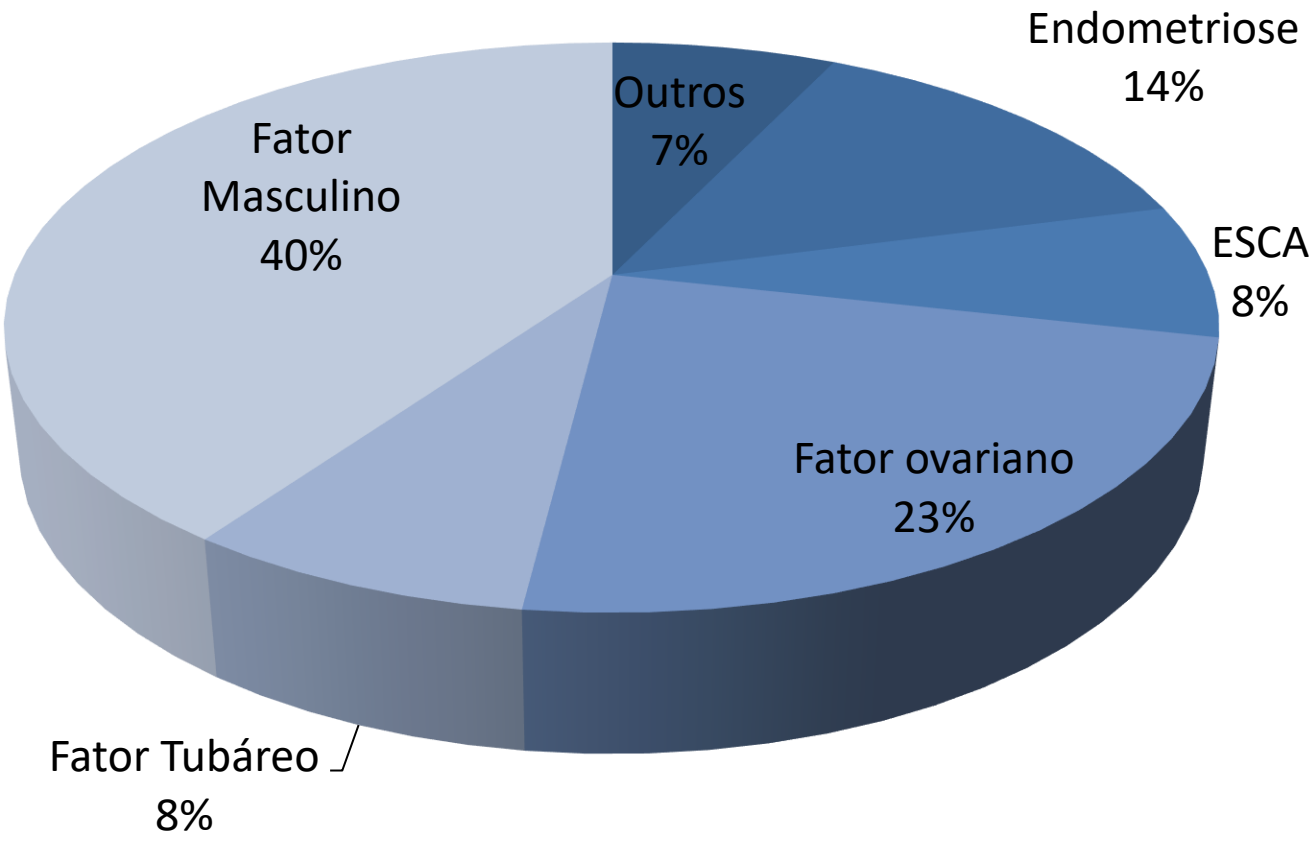
2005 - 2022



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Influência da qualidade do espermatozoide ejaculado nos resultados de ICSI – *JBRA, 5: 22-26, 2001*

Borges Jr. E., et al

	< 1 x 10^6/ml motilidade <10%	*sem fator masculino*	*P*
Ciclos / pacientes	105 / 82	184/141	
Fertilização Normal (2PN)	**628 (36,0%)**	**1256 (67,8%)**	**0,014**
Oocitos não-fertilizados	**942 (54,1%)***	**362 (19,6%)**	**0,025**
Bons embriões	**44,5%**	**87,1%**	**0,029**
Gestação / ciclo	31,4%	29,9%	0,216
Gestação/ paciente	40,8%	38,9%	0,067
Abortamento	**43,5% (10/33)**	**25,4 % (14/55)**	**0,012**

** Idade materna ≤ 35 anos e Número de ovócitos recuperados ≥ 4*

ORIGINAL ARTICLE

Overcoming male factor infertility with intracytoplasmic sperm injection

Rev Assoc Med Bras 2017; 63(8):706-712

Edson Borges, Bianca Zanetti, Daniela Braga, Rita Figueira, Aguinaldo Nardi

FERTILITY MEDICAL GROUP

TABLE 1 Effects of the infertility causes on laboratorial and clinical ICSI outcomes.

Variables	Male factor (n=743)	Tubal factor (n=179)	p-value
Female age (y-old)	33.16±3.91	33.85±3.79	0.033
Male age (y-old)	37.75±7.37	36.59±5.65	0.022
COS outcomes			
Aspirated follicles (n)	19.98±10.74	17.93±10.44	0.022
Retrieved oocytes (n)	14.79±8.91	13.39±8.81	0.060
Oocyte yield (%)	73.55±18.53	74.80±19.00	0.422
Mature oocytes (n)	10.97±6.91	9.58±6.40	0.014
Mature oocyte rate (%)	74.26±18.13	72.77±18.74	0.329
Laboratorial outcomes			
Fertilization rate (%)	82.28±18.09	85.64±14.81	0.010
Normal fertilization rate (%)	75.72±20.50	78.42±18.36	0.109
High-quality embryo at D3 (%)	48.26±28.56	44.51±29.83	0.158
Blastocyst formation rate (%)	42.10±26.64	43.00±29.04	0.772
Transferred embryos (n)	1.68±0.67	1.50±0.61	0.004
Clinical outcomes			
Implantation rate (%)	35.55±42.21	32.00±42.20	0.340
Pregnancy rate	292/622 (46.9%)	66/161 (40.9%)	0.184
Miscarriage rate	31/302 (10.3%)	7/66 (10.6%)	0.572

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The Aging Male, Month 13(1):44-50, 2010 Edson Borges Jr., *et al.*

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[1]*Fertility – Assisted Fertilization Center, São Paulo, SP, Brazil,* [2]*Sapientiae Institute – Educational and Research Center in Assisted Reproduction, São Paulo, SP, Brazil, and* [3]*Institute of Biotechnology – Caxias do Sul University, Caxias do Sul, RS, Brazil*

ORIGINAL ARTICLE

Assisted reproductive technology outcomes in azoospermic men: 10 years of experience with surgical sperm retrieval

Table II. ICSI outcomes from patients with obstructive azoospermia when the injected spem were retrieved from the testicle (TESA) or epididymis (PESA).

	Study group		
Variable	OA-TESA (n=103)	OA-PESA (n=171)	*p* value
Normal fertilization rate (%)	57.9 ± 9.5 (48.5–67.5)	65.2 ± 4.1 (54.7–69.3)	*0.0017*
Abnormal fertilization rate (%)	13.2 ± 6.3 (6.5–19.5)	12.7 ± 5.3 (7.9–18.0)	0.9437
Fertilization failure rate (%)	28.9 ± 8.9 (20.2–37.8)	22.1 ± 6.0 (15.8–28.1)	0.1081
Non-cleaved rate (%)	9.87 ± 5.9 (4.2–15.8)	7.46 ± 3.9 (3.5–11.4)	0.4406
Pregnancy rate (%)	31.9 ± 9.0 (23.0–41.0)	32.5 ± 7.5 (25.9–40.0)	0.8803
Abortion rate (%)	38.8 ± 9.6 (29.6–48.4)	18.0 ± 5.8 (12.2–23.8)	*0.0387*
Implantation rate (%)	9.4 ± 5.6 (3.8–15.0)	10.5 ± 4.0 (5.5–14.5)	0.6054

Values in percentage expressed as mean ± SD (confidence interval of the frequencies).

The Aging Male, Month 13(1):44-50, 2010 Edson Borges Jr., *et al.*

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ORIGINAL ARTICLE

Assisted reproductive technology outcomes in azoospermic men: 10 years of experience with surgical sperm retrieval

Table IV. ICSI outcomes when the injected sperm were retrieved from the testicle (TESA) of patients with obstructive (OA) or non-obstructive (NOA) azoospermia.

	Study group		
Variable	OA-TESA (n=103)	NOA-TESA (n=102)	*p* value
Normal fertilization rate (%)	57.9 ± 9.5 (48.5–67.5)	50.4 ± 9.3 (40.3–59.7)	*0.0050*
Abnormal fertilization rate (%)	13.2 ± 6.3 (6.5–19.5)	13.98 ± 6.8 (7.3–20.7)	0.4421
Fertilization failure rate (%)	28.9 ± 8.9 (20.2–37.8)	35.65 ± 11.8 (27.6–47.4)	*0.0023*
Non cleaved rate (%)	9.87 ± 5.9 (4.2–15.8)	16.1 ± 17 (8.9–23.1)	*0.0034*
Pregnancy rate (%)	31.9 ± 9.0 (23.0–41.0)	29.7 ± 9.2 (21.1–38.9)	0.4166
Abortion rate (%)	38.8 ± 9.6 (29.6–48.4)	37.0 ± 9.4 (27.6–46.4)	0.9992
Implantation rate (%)	9.4 ± 5.6 (3.8–15.0)	9.65 ± 6.1 (4.2–15.8)	0.8519

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The Aging Male, Month 13(1):44-50, 2010 Edson Borges Jr., *et al.*

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ISSN: 2047-2919

ANDROLOGY

ORIGINAL ARTICLE

Correspondence:
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E-mail: edson@fertility.com.br

*These authors contributed equally to this manuscript.

Keywords:
intracytoplasmic sperm injection, infertility, sperm count, sperm motility, spermatozoa

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Accepted: 21-Mar-2016

doi: 10.1111/andr.12199

Total motile sperm count has a superior predictive value over the WHO 2010 cut-off values for the outcomes of intracytoplasmic sperm injection cycles

[1,2]*E. Borges Jr, [1,2]*A. S. Setti, [1,2]D. P. A. F. Braga, [1]R. C. S. Figueira and [1,2]A. Iaconelli Jr

- ***Definição: TMSC = volume x conc/ml x % A+B / 100%***
- 518 ciclos de ICSI
- TMSC normal: > 20 milhões

Table 4 Comparison of ICSI outcomes between normal and abnormal TMSC groups

Variables	Normal TMSC group (n = 328)	Abnormal TMSC group (n = 190)	p-value
Paternal age (year-old)	37.4 ± 4.8	38.1 ± 6.1	0.187
Maternal age (year-old)	35.4 ± 3.9	33.5 ± 4.0	<0.001
Number of aspirated follicles	17.8 ± 9.7	20.8 ± 11.2	0.002
Number of obtained oocytes	12.7 ± 7.2	15.1 ± 8.1	0.001
Number of mature oocytes	9.7 ± 5.5	11.2 ± 6.2	0.003
Number of injected oocytes	9.4 ± 4.3	10.2 ± 4.9	0.067
Fertilization rate (%)	84.9 ± 14.4	81.1 ± 15.8	0.016
Number of obtained embryos	8.2 ± 3.8	8.7 ± 4.4	0.204
Number of transferred embryos	2.2 ± 0.6	2.2 ± 0.5	0.469
Implantation rate (%)	25.1 ± 36.0	25.8 ± 35.2	0.832
Pregnancy rate (%)	134/328 (40.9)	94/190 (49.5)	0.060
Miscarriage rate (%)	29/162 (17.9)	23/78 (29.5)	0.041

SD, standard deviation; TMSC: total motile sperm count.

Table 5 Linear and binary regression analysis results for the influences of TMSC and WHO cut-off values on ICSI outcome

Variables	Method	OR or RC	CI or R^2	*p*-value
Fertilization rate	Concentration	3.994	1.4%	0.015
	Motility	0.097	0.0%	0.957
	Progressive motility	2.299	0.5%	0.163
	Morphology	8.735	0.9%	0.047
	TMSC	3.784	1.5%	0.013
	Normal TMSC	−0.253	0.1%	0.592
Formation of high-quality zygotes on D1	Concentration	1.64	1.09–2.46	0.018
	Motility	1.34	0.85–2.12	0.208
	Progressive motility	1.22	0.80–1.85	0.355
	Morphology	0.89	0.65–1.22	0.461
	TMSC	1.13	1.01–1.28	0.049
	Normal TMSC	0.99	0.97–1.02	0.629
Formation of high-quality embryos on D2	Concentration	0.93	0.76–1.09	0.101
	Motility	0.91	0.79–1.06	0.222
	Progressive motility	1.06	0.92–1.22	0.420
	Morphology	0.84	0.60–1.18	0.314
	TMSC	1.18	1.03–1.35	0.013
	Normal TMSC	0.97	0.94–1.01	0.098
Formation of high-quality embryos on D3	Concentration	0.91	0.79–1.06	0.229
	Motility	0.93	0.79–1.09	0.379
	Progressive motility	1.00	0.85–1.17	0.969
	Morphology	1.18	0.83–1.67	0.354
	TMSC	1.12	1.07–1.29	0.037
	Normal TMSC	0.98	0.95–1.02	0.319
Formation of blastocyst on D5	Concentration	1.11	0.97–1.27	0.116
	Motility	1.03	0.90–1.19	0.660
	Progressive motility	0.91	0.70–1.23	0.303
	Morphology	1.13	0.83–1.55	0.427
	TMSC	1.16	1.04–1.26	0.011
	Normal TMSC	1.00	0.97–1.04	0.802

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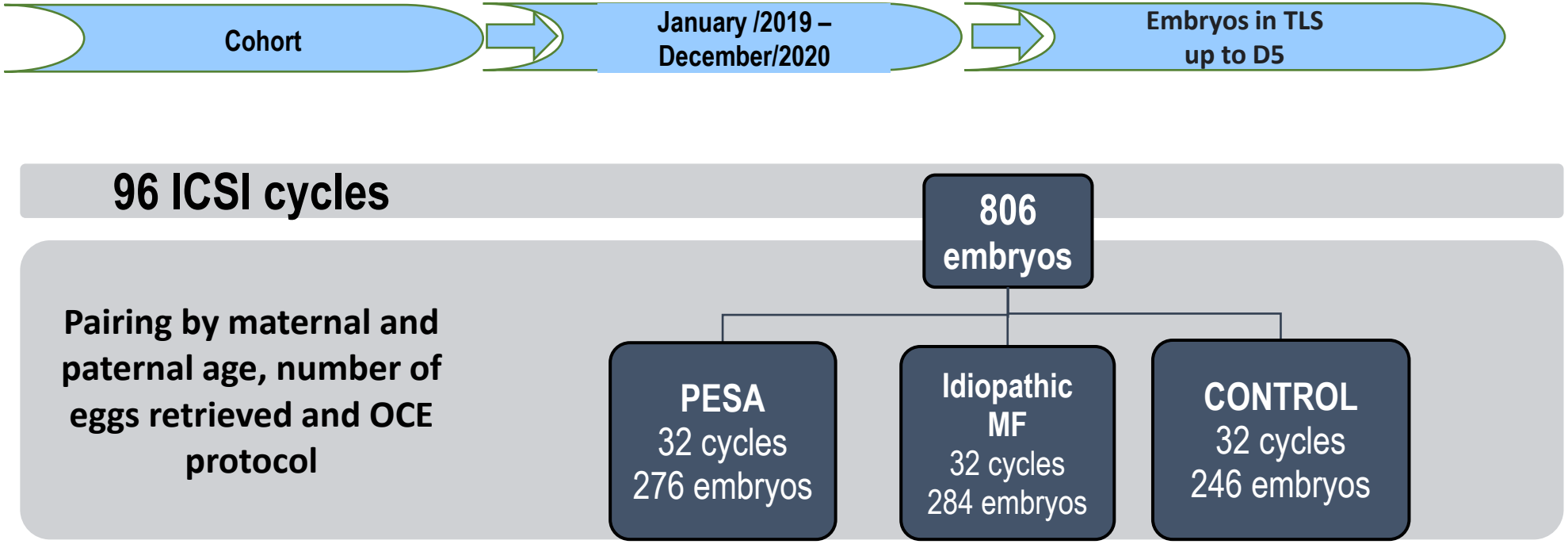
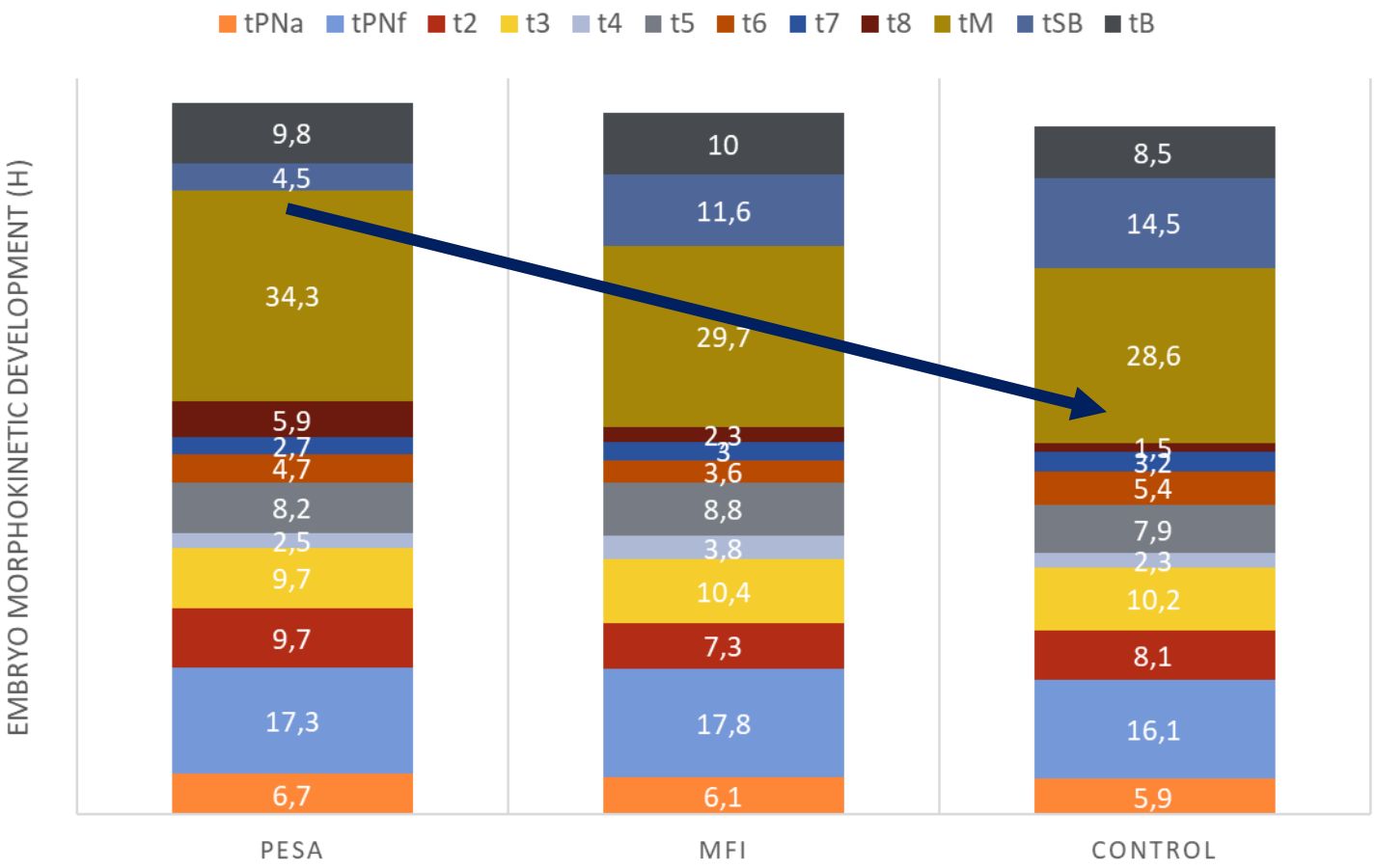
Blastocyst expansion grade on D5	Concentration	0.83	0.66–1.05	0.120
	Motility	1.01	0.79–1.29	0.948
	Progressive motility	1.08	0.85–1.38	0.533
	Morphology	0.99	0.57–1.71	0.962
	TMSC	1.27	1.01–1.60	0.042
	Normal TMSC	1.03	0.98–1.07	0.287
Implantation rate	Concentration	2.387	0.1%	0.492
	Motility	−2.916	0.1%	0.453
	Progressive motility	−1.754	0.0%	0.616
	Morphology	6.084	0.0%	0.502
	TMSC	−0.688	0.0%	0.833
	Normal TMSC	1.705	1.0%	0.222
Pregnancy	Concentration	0.71	0.49–1.05	0.083
	Motility	0.77	0.50–1.19	0.242
	Progressive motility	0.72	0.49–1.05	0.089
	Morphology	2.17	0.78–6.07	0.132
	TMSC	1.40	0.98–2.01	0.066
	Normal TMSC	0.94	0.86–1.03	0.200
Miscarriage	Concentration	0.57	0.30–1.08	0.089
	Motility	1.32	0.61–2.85	0.478
	Progressive motility	1.05	0.54–2.05	0.886
	Morphology	0.84	0.17–4.08	0.826
	TMSC	0.52	0.28–0.90	0.045
	Normal TMSC	1.12	0.91–1.26	0.084

CI, confidence interval; OR, odds ratio; RC, regression coefficient; TMSC, total motile sperm count; WHO, World Health Organization.

Use of epididymal spermatozoa in ICSI cycles impacts the morphokinetic of embryos: lessons of time-lapse system

Borges E. *et al* (submitted)





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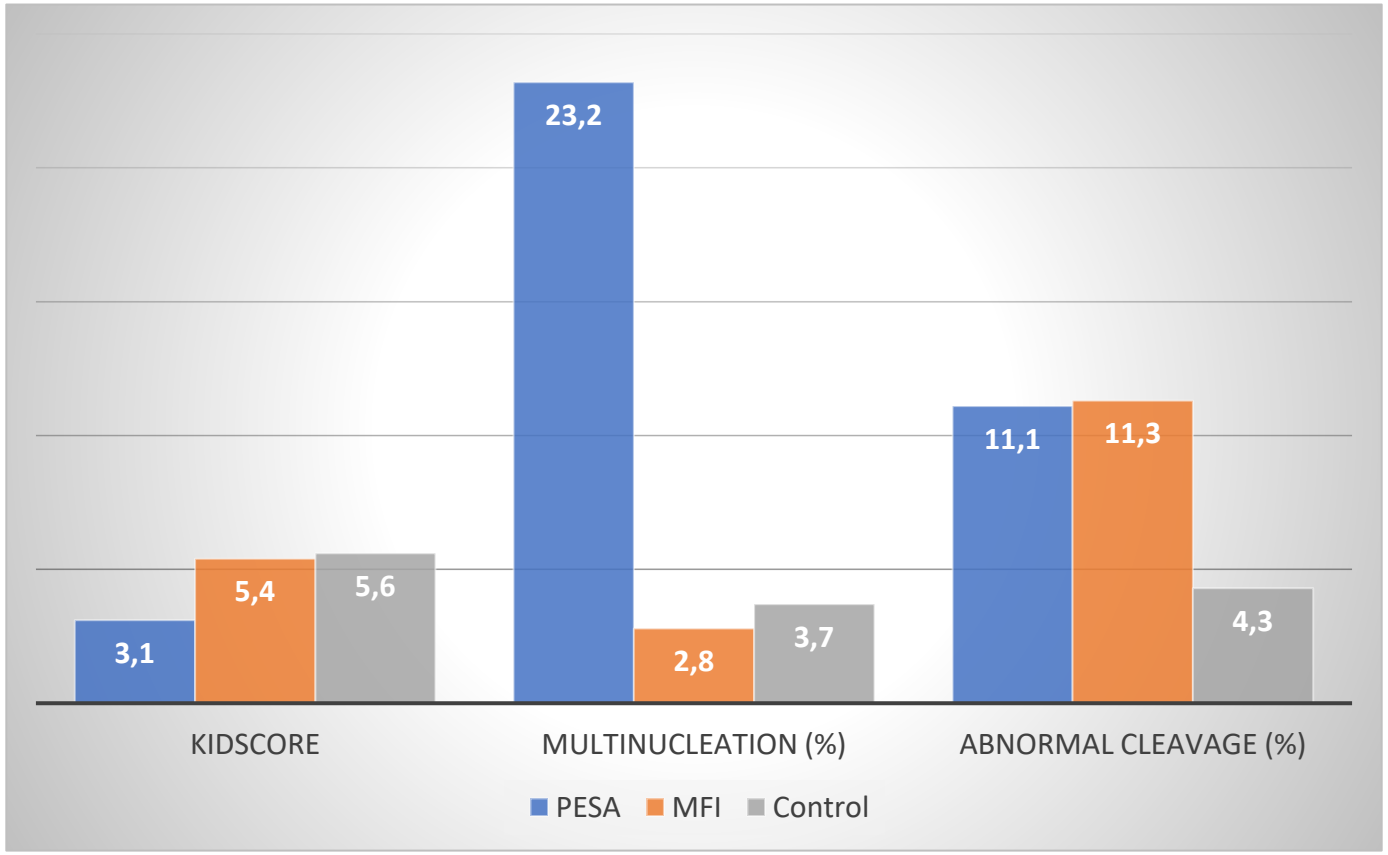
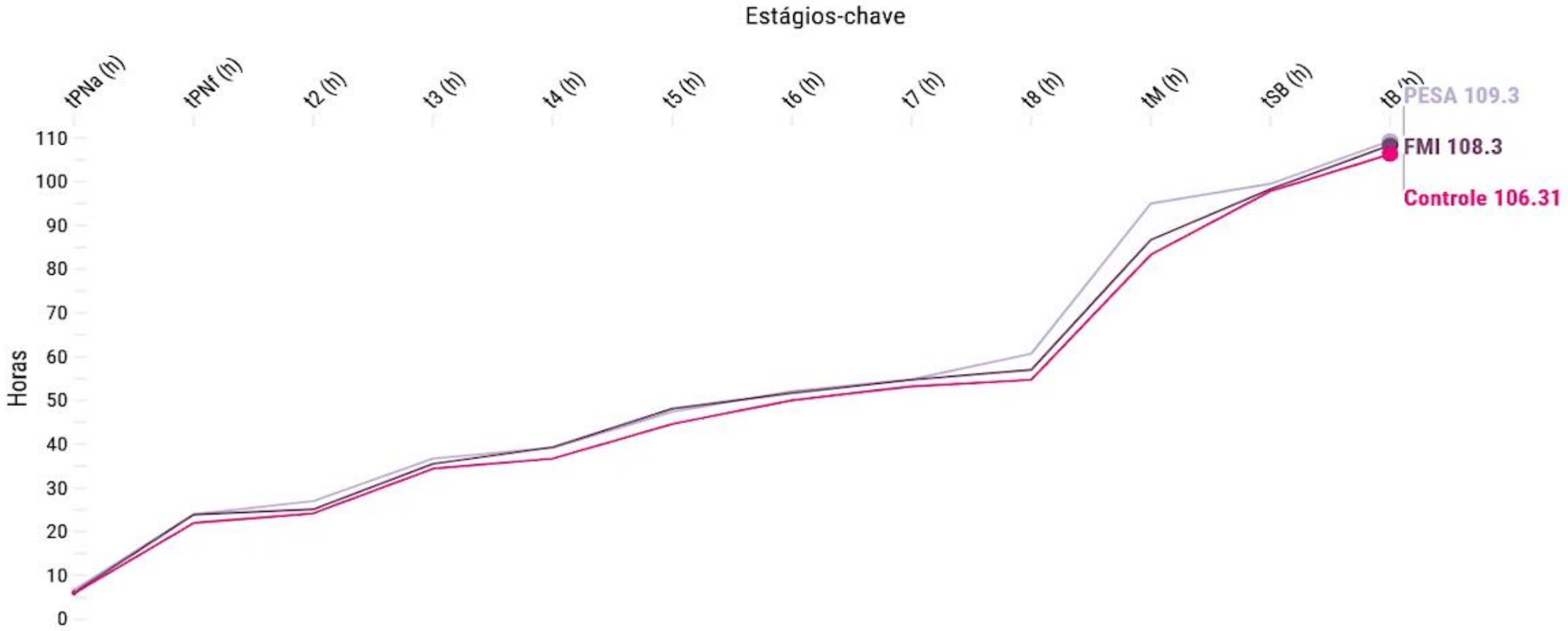


Figure 3. A comparison of KIDScore, and incidences of multinucleation and abnormal cleavage patterns in PESA, MFI and Control groups.

Note: KIDScore – known implantation diagnosis, PESA – percutaneous epididymal sperm aspiration, MFI – male factor infertility.

Behavior of embryos from the PESA, IFM and Control groups in relation to early and late morphokinetics events



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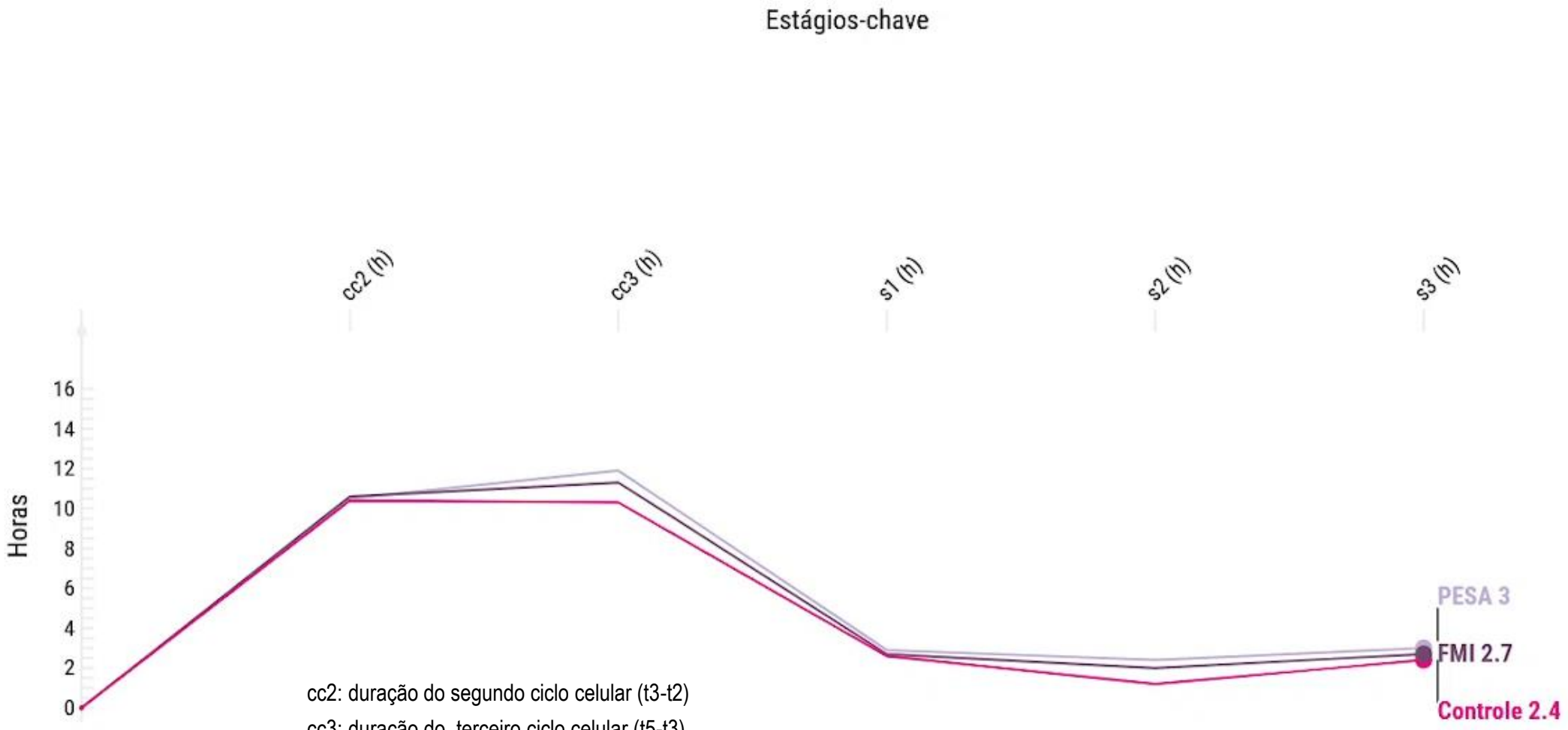
Behavior of embryos from the PESA, FM and Control groups in relation to cell cycles and synchronous divisions



cc2: duração do segundo ciclo celular (t3-t2)
cc3: duração do terceiro ciclo celular (t5-t3)
s1 (t2-tPNf), s2 (t4-t3), s3 (t8- t5)

FERTGROUP | FERTILITY

RBMO

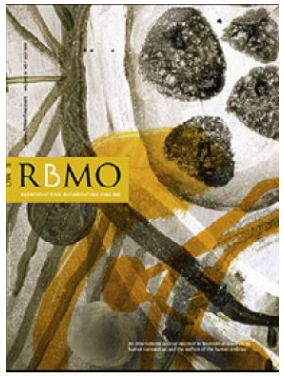
ELSEVIER

ARTICLE

The obstructive interval predicts pregnancy rates in post-vasectomy patients undergoing ICSI with surgical sperm retrieval

BIOGRAPHY
Edson Borges Jr obtained his MD degree in 1984 (University of Campinas), PhDs in urology in 2005 (Federal University of São Paulo) and in gynaecology in 2007 (São Paulo State University). He is founder and managing partner of Fertility Medical Group and director at Sapientiae Institute, São Paulo, Brazil.

Edson BorgesJr[1,2,*], Daniela Paes de Almeida Ferreira Braga[1,2], Assumpto IaconelliJr[1,2], Amanda Souza Setti[1,2]



RBMO VOLUME 39 ISSUE 1 2019

TABLE 4 INFLUENCE OF THE OBSTRUCTIVE INTERVAL ON THE OUTCOMES OF ICSI WITH SSR

				95% CI	
ICSI outcome	**Estimate (β)**	**SE**	***P*-value**	**Lower bound**	**Upper bound**
Fertilization rate[a]	–0.098	0.302	NS	–0.696	0.500
Day 2 high-quality embryos rate[a]	–0.001	0.003	NS	–0.007	0.005
Day 3 high-quality embryos rate[a]	0.001	0.003	NS	–0.003	0.007
Blastocyst development rate[a]	–0.011	0.004	0.014	–0.019	–0.002
Clinical pregnancy rate[b]	–0.016	0.007	0.031	–0.031	–0.001
Implantation rate[b]	–1.107	0.530	0.039	–2.157	–0.056
Miscarriage rate[b]	0.006	0.009	NS	–0.012	0.025

[a] Adjusted for maternal and paternal ages, paternal smoking habit, previous vasectomy reversal attempt, paternal hormonal profile and abnormalities found in the male partner physical examination, and number of retrieved oocytes.
[b] Adjusted for the same variables cited above plus number of transferred embryos.CI = confidence interval; ICSI = intracytoplasmic sperm injection; NS = not significant; SE = standard error; SSR = surgical sperm retrieval.

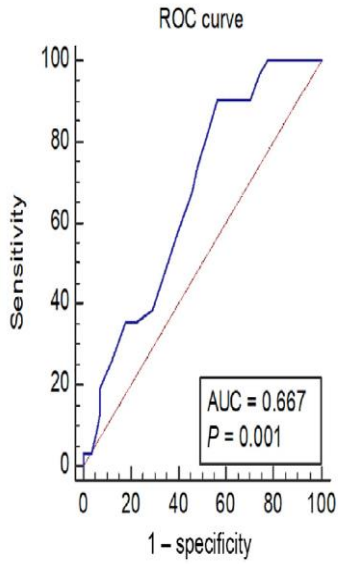


FIGURE 1 Receiver operating characteristic (ROC) curve for predicting clinical pregnancy using obstruction interval as test variable.

RBMOnline - Vol 18. No 4. 2009 536-542 Reproductive BioMedicine Online; www.rbmonline.com/Article/3557 on web 24 February 2009

Article

Paternal contribution to aneuploidy in preimplantation embryos

Dr Cristina Magli

M Cristina Magli is laboratory director at the SISMER Reproductive Medicine Unit in Bologna. She has been working in IVF for almost 20 years in collaboration with Luca Gianaroli. Together, they were the first in Europe to offer preimplantation genetic diagnosis for aneuploidy, improving the success rate in patients with a poor prognosis of pregnancy. She is currently coordinator of the ESHRE Special Interest Group on Embryology and actively contributed to the revised ESHRE Guidelines for Good Practice in IVF laboratories.

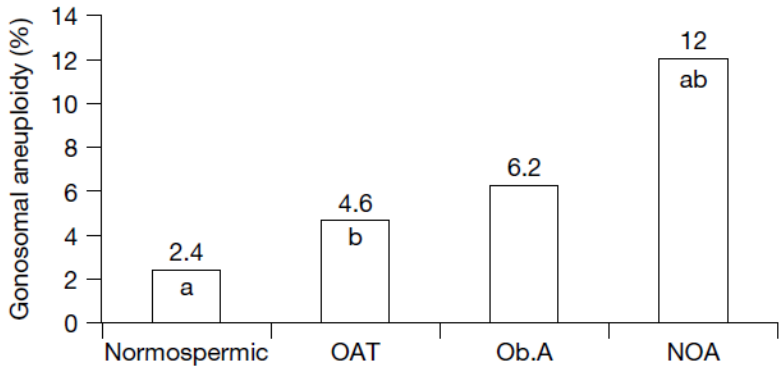


Figure 1. Proportion of embryos carrying gonosomal aneuploidy in the different sperm categories. OAT = oligoasthenoteratozoospermia; Ob.A = obstructive azoospermia; NOA = non-obstructive azoospermia. Values with the same superscript letter are significantly different ($^{a}P < 0.001$; $^{b}P < 0.025$).

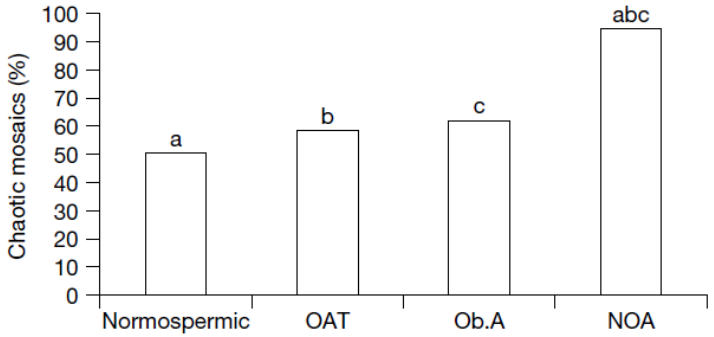


Figure 2. Proportion of embryos carrying chaotic mosaics in the different sperm categories. OAT = oligoasthenoteratozoospermia; Ob.A = obstructive azoospermia; NOA = non-obstructive azoospermia. Values with the same superscript letter are significantly different ($^{a,b,c}P < 0.001$).

FERTGROUP

Use of suboptimal sperm increases the risk of aneuploidy of the sex chromosomes in preimplantation blastocyst embryos

Alison Coates, B.Sc.,[a,b] John S. Hesla, M.D.,[a] Amanda Hurliman, M.D.,[a] Breanne Coate, B.S.,[a] Elizabeth Holmes, M.S.,[a] Rebecca Matthews, Ph.D.,[a] Emily L. Mounts, M.S.,[a] Kara J. Turner, Ph.D.,[b] Alan R. Thornhill, Ph.D.,[b,c] and Darren K. Griffin, D.Sc.[b]

- A infertilidade masculina grave está associada a ***um aumento significativo na ocorrência de anormalidades dos cromossomos sexuais em blastocistos***, em comparação com embriões derivados de amostras de sêmen normais.

- As ***taxas de aneuploidia*** em embriões derivados de sêmens com ***parâmetros normais*** não foram significativamente diferentes se ***ICSI ou inseminação padrão*** foi usada para obter a fertilização.

ORIGINAL ARTICLE: ANDROLOGY

Effect of the male factor on the clinical outcome of intracytoplasmic sperm injection combined with preimplantation aneuploidy testing: observational longitudinal cohort study of 1,219 consecutive cycles

Rossella Mazzilli, M.D.,[a,b] Danilo Cimadomo, M.Sc.,[b,c] Alberto Vaiarelli, M.D.,[b,d] Antonio Capalbo, Ph.D.,[b,e] Lisa Dovere, Ph.D.,[b] Erminia Alviggi, M.Sc.,[f] Ludovica Dusi, Ph.D.,[g] Carlo Foresta, M.D.,[h] Francesco Lombardo, M.D.,[i] Andrea Lenzi, M.D.,[i] Herman Tournaye, M.D.,[j] Carlo Alviggi, M.D.,[k] Laura Rienzi, M.Sc.,[b,f,g] and Filippo Maria Ubaldi, M.D.[b,f,g]

VOL. 108 NO. 6 / DECEMBER 2017

- O fator masculino grave prejudica a competência embrionária precoce em termos de ***taxa de fertilização e potencial de desenvolvimento.***

- No entanto, ***a taxa de euploidia e o potencial de implantação dos blastocistos obtidos são independentes da qualidade espermática, assim como os eventos obstétricos e perinatais***.

Journal of Assisted Reproduction and Genetics (2019) 36:2047–2055
https://doi.org/10.1007/s10815-019-01584-w

ASSISTED REPRODUCTION TECHNOLOGIES

Check for updates

Male factor infertility impacts the rate of mosaic blastocysts in cycles of preimplantation genetic testing for aneuploidy

Nicoletta Tarozzi[1] · Marco Nadalini[1] · Cristina Lagalla[1] · Giovanni Coticchio[1] · Carlotta Zacà[1] · Andrea Borini[1]

- O ***resultado reprodutivo*** dos grupos MF e NMF não indicou diferenças estatisticamente significativas.
- Não foram encontradas diferenças entre os *grupos MF e NMF* em termos de taxas de ***blastocistos euplóides ou aneuplóides.***
- Taxa significativamente ***maior taxa de blastocistos em mosaico*** foi observada no ***grupo MF (3,6% vs. 0,5%, respectivamente; P = 0,03).***
- Taxa significativamente ***maior de blastocistos em mosaico*** foi observada ***no grupo SMF (7,7% e 1,8%, respectivamente; P = 0,008).***

Jwa *et al. BMC Pregnancy and Childbirth* (2019) 19:192
https://doi.org/10.1186/s12884-019-2322-7

BMC Pregnancy and Childbirth

RESEARCH ARTICLE Open Access

Male subfertility and the risk of major birth defects in children born after in vitro fertilization and intracytoplasmic sperm injection: a retrospective cohort study

Seung Chik Jwa[1,2*], Junna Jwa[1], Akira Kuwahara[3], Minoru Irahara[3], Osamu Ishihara[2] and Hidekazu Saito[1]

- ***Estudo de coorte retrospectivo*** usando dados do registro japonês de tecnologia reprodutiva assistida entre 2007 e 2014; ***ciclos de transferência de embriões frescos (n=59.971)***

- ***Defeitos congênitos graves*** foram relatados em 626/59.971 ***(1,04%)*** casos.

- A ***subfertilidade masculina*** maior risco:
  - ***hipospádia*** (3/3163 [0,09%] vs 4/28.671 [0,01***%], OR ajustado = 6,85***, IC 95% 2,05–22,9, P = 0,002)
  - ***defeitos do septo atrial*** (4/ 3163 [0,13%] vs 9/28.671 [0,03%], ***OR ajustado = 3,98***, IC 95% 1,12–14,1, P = 0,03) em comparação com homens férteis.

Jwa et al. BMC Pregnancy and Childbirth (2019) 19:192
https://doi.org/10.1186/s12884-019-2322-7

BMC Pregnancy and Childbirth

RESEARCH ARTICLE Open Access

Male subfertility and the risk of major birth defects in children born after in vitro fertilization and intracytoplasmic sperm injection: a retrospective cohort study

Seung Chik Jwa[1,2*], Junna Jwa[1], Akira Kuwahara[3], Minoru Irahara[3], Osamu Ishihara[2] and Hidekazu Saito[1]

- *Oligozoospermia* (ou seja, concentração espermática< 15 milhões/mL): maior risco de *defeitos do septo ventricular* em comparação com concentrações normais em gestações de fertilização in vitro (5/868 [0,58%] vs 60/28.090 [0,21%], *OR = 2.68*, 95% IC 1.15– 6.27, P = 0.02).

- *Oligozoospermia grave* (ou seja, concentrações de esperma < 5 milhões/mL): aumentado de *hipospádia* em comparação com concentrações normais em gestações com ICSI (5/3136 [0,16%] vs 5/16.865 [0,03%], *OR ajustado = 3,88*, IC 95% 1,14–13,2, P = 0,03).

Table 1. Comparison of cycle characteristics and clinical outcomes between ICSI cycles with Normal Sperm Parameters, Male Factor Infertility (< 20M sptz /mL), and Severe Male Factor Infertility (< 1M sptz /mL) .

FERTILITY

dados não publicados

Variable	Normal sperm parameters	Male factor infertility	Severe male factor infertility	p
Cycles	2583	795	300	
Female age (years)	33.1 ± 3.8	33.3 ± 2.4	33.8 ± 2.8	0.451
Male age (years)	37.545 ± 0.5	37.870 ± 0.4	37.490 ± 0.2	0.478
Retrieved oocytes (n)	11.2 ± 1.2	17.4 ± 1.0	17.8 ± 4.6	0.384
Fertilization (%)	89.5 ± 8.4	89.8 ± 2.3	88.9 ± 2.8	0.475
High quality embryos rate (%)	31.8± 1.0[a]	27.1 ± 2.4[b]	24.9 ± 3.0[c]	**<0.001**
Blastocyst formation (%)	43.3 ± 4.4	44.3 ± 4.4	38.5 ± 3.8	0.263
Implantation rate	40.4 ± 0.8[a]	33.6 ± 0.5[b]	28.5 ± 1.0[c]	**< 0.001**
Pregnancy Rate	47.0 ± 5.8[a]	44.0 ± 2.5[a,b]	35.0 ± 7.3[b]	**0.045**
Miscarriage Rate	8.4 ± 6.8[a]	10.3 ± 5.7	12.4 ± 8.4	0.351

Note: Values are means ± standard errors. a≠b≠c

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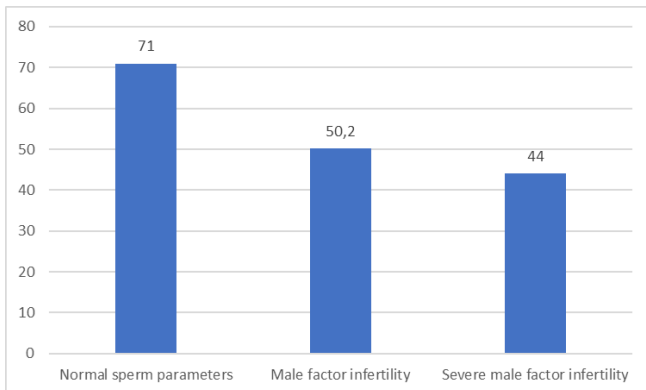
Table 2. Incidence of euploidy among ICSI cycles with Normal Sperm Parameters, Male Factor Infertility (< 20M sptz /mL), and Severe Male Factor Infertility (< 1M sptz /mL) .

FERTILITY

dados não publicados

Variable	Normal sperm parameters	Male factor infertility	Severe male factor infertility	p
Cycles	540	198	75	
Biopsied Embryos	1,140	270	120	
Euploidy rate	71.0 ± 17.1[a]	50.2 ± 35.4[a,b]	44.0 ± 6.4[b]	**0.035**



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Infertilidade e Mortalidade

Relação entre Qualidade Seminal e Mortalidade

American Journal of Epidemiology
Vol. 170, No. 5
DOI: 10.1093/aje/kwp168
Advance Access publication July 27, 2009
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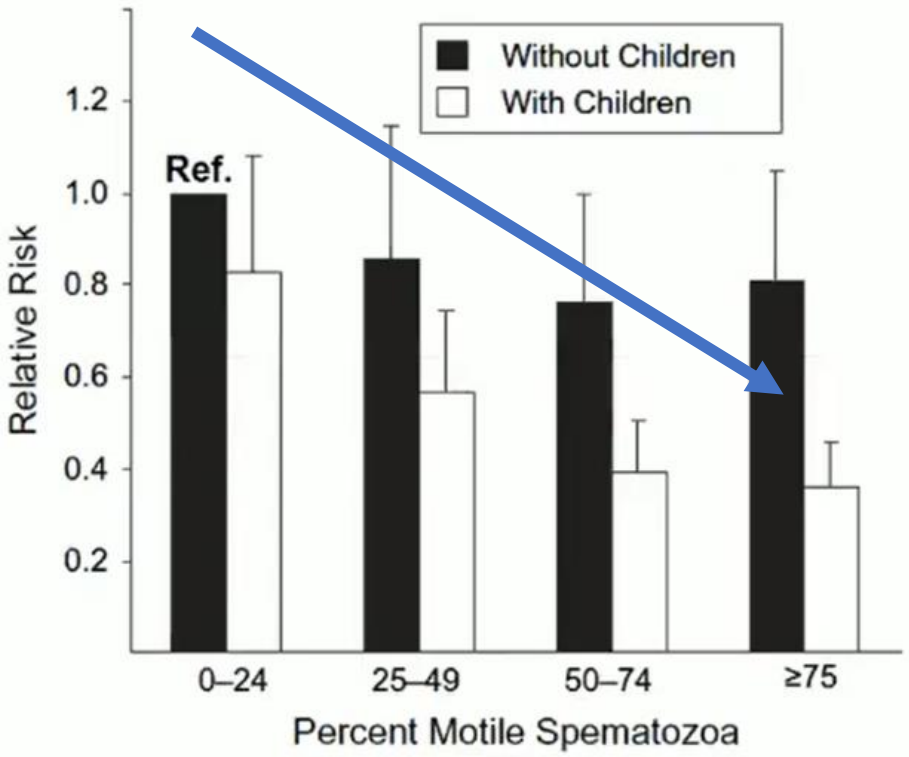
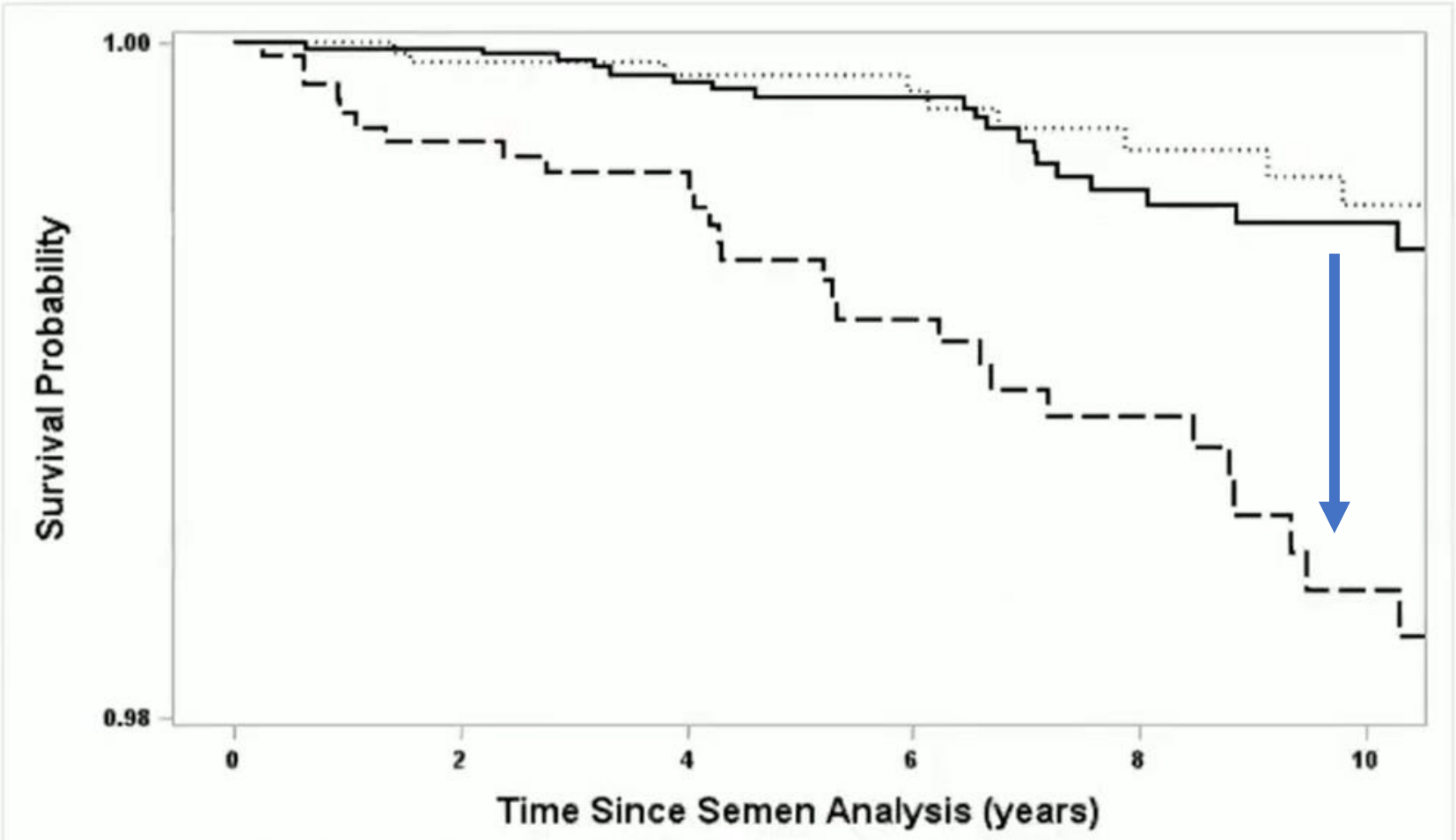
Original Contribution

Good Semen Quality and Life Expectancy: A Cohort Study of 43,277 Men

Tina Kold Jensen, Rune Jacobsen, Kaare Christensen, Niels Christian Nielsen, and Erik Bostofte

Relação entre Qualidade Seminal e Mortalidade





Life Table of Number of Abnormalities — 0 ····· 1 — — — 2+

0	5687	5539	4581	3470	2285	1356
1	3318	3235	2675	2023	1504	1104
2+	2391	2311	1952	1529	1110	790

Human Reproduction, Vol.32, No.1 pp. 239–247, 2017
Advanced Access publication on December 6, 2016 doi:10.1093/humrep/dew289

human reproduction

ORIGINAL ARTICLE *Reproductive epidemiology*

Risk of childhood mortality in family members of men with poor semen quality

Heidi A. Hanson[1,2,*], Erik N. Mayer[3], Ross E. Anderson[3], Kenneth I. Aston[3,4,5], Douglas T. Carrell[3,5], Justin Berger[2], William T. Lowrance[3], Ken R. Smith[2,6], and James M. Hotaling[3,4]

- Risco aumentado de ***morte devido a Malformações Congênitas*** em descendentes de 1º. grau de ***homens com alterações dos parâmetros seminais***

Human Reproduction, Vol.34, No.11, pp. 2266–2273, 2019
Advance Access Publication on November 4, 2019 doi:10.1093/humrep/dez189

human reproduction **ORIGINAL ARTICLE** ***Reproductive epidemiology***

Male factor infertility and risk of death: a nationwide record-linkage study

Clara Helene Glazer[1,2,*], Michael L. Eisenberg[2], Sandra Søgaard Tøttenborg[1], Aleksander Giwercman[3], Esben Meulengracht Flachs[1], Elvira Vaclavik Bräuner[4,5], Ditte Vassard[6], Anja Pinborg[7], Lone Schmidt[6], and Jens Peter Bonde[1]

- Homens submetidos a TRA na Dinamarca (coorte MAR; n=64.563); ***população final de 384.419 homens***

- ***Homens com azoospermia*** tiveram o maior risco de morte, que persistiu tanto na comparação interna [***HR, 2,30***; 95% CI, 1,54–3,41] como na comparação externa [***HR, 3,32***; IC 95%, 2,02–5,40]

Considerações (1)

- Piora da capacidade reprodutiva do homem, principalmente nas duas últimas décadas;
- TMSC parece estar mais relacionada com o potencial reprodutivo *in vitro* do espermatozoide;
- Espermatozoides epididimários e de homens com fator masculino idiopático produzem embriões com pior desenvolvimento morfocinético e com mais alterações de divisão;
- Quanto maior o tempo de obstrução nos homens vasectomizados, pior a qualidade embrionária, menores as taxas de implantação e gestação e maiores as taxas de aborto;

Considerações (2)

- A alteração seminal interfere nas taxas de fertilização e abortamento, não sendo afetados o desenvolvimento embrionário, as chances de implantação e gestação. Exceção feita as alterações seminais muito graves (< 1 milhão / mL);
- A taxa de aneuploidia dos cromossomos sexuais e as taxas de mosaicismo dos embriões parecem estar relacionada com a gravidade da alteração seminal;
- Maior incidência de hipospadia e de defeitos do septo atrial e ventricular parece estar associada com gravidade da alteração seminal;
- Maior índice de mortalidade quanto maior a gravidade da alteração seminal.

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