



XIV CONGRESSO  
PAULISTA  
UROLOGIA

7 A 10 DE SETEMBRO DE 2016

SHERATON SÃO PAULO WTC HOTEL

# CP: Abordagem e tratamento do paciente infértil

## Infertilidade Masculina e Técnicas de Reprodução Assistida

Edson Borges Jr.



FERTILITY<sup>®</sup>  
MEDICAL GROUP



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**Declaro:**

**Ausência de Conflito de Interesse**

**Resolução do Conselho Federal de Medicina  
nº 1.595/2.000**



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<http://fertility.com.br/producao-cientifica-2016/>



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# *Etiologia da infertilidade masculina*

- **fator masculino: ~ 50%**
- Infertilidade idiopática: 30% dos homens
- Doença multifatorial com fenótipo heterogêneo

# *Etiologia da infertilidade masculina*

**Varicocele** 42,2

**Idiopática** 22,7

**Obstrução** 14,7

♀ / ♂ **Normais** 7,9

**Criptorquidia** 3,4

**Imunológica** 2,6

**Ejaculatório** 1,3

**Falência Testicular** 1,3



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# Reprodução assistida



- Conjunto de técnicas variadas que incluem a manipulação e a aproximação de gametas
- Todo o procedimento no qual o médico interfere de alguma forma, manuseando gametas e/ou pré-embriões



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# *Técnicas de Reprodução Assistida*

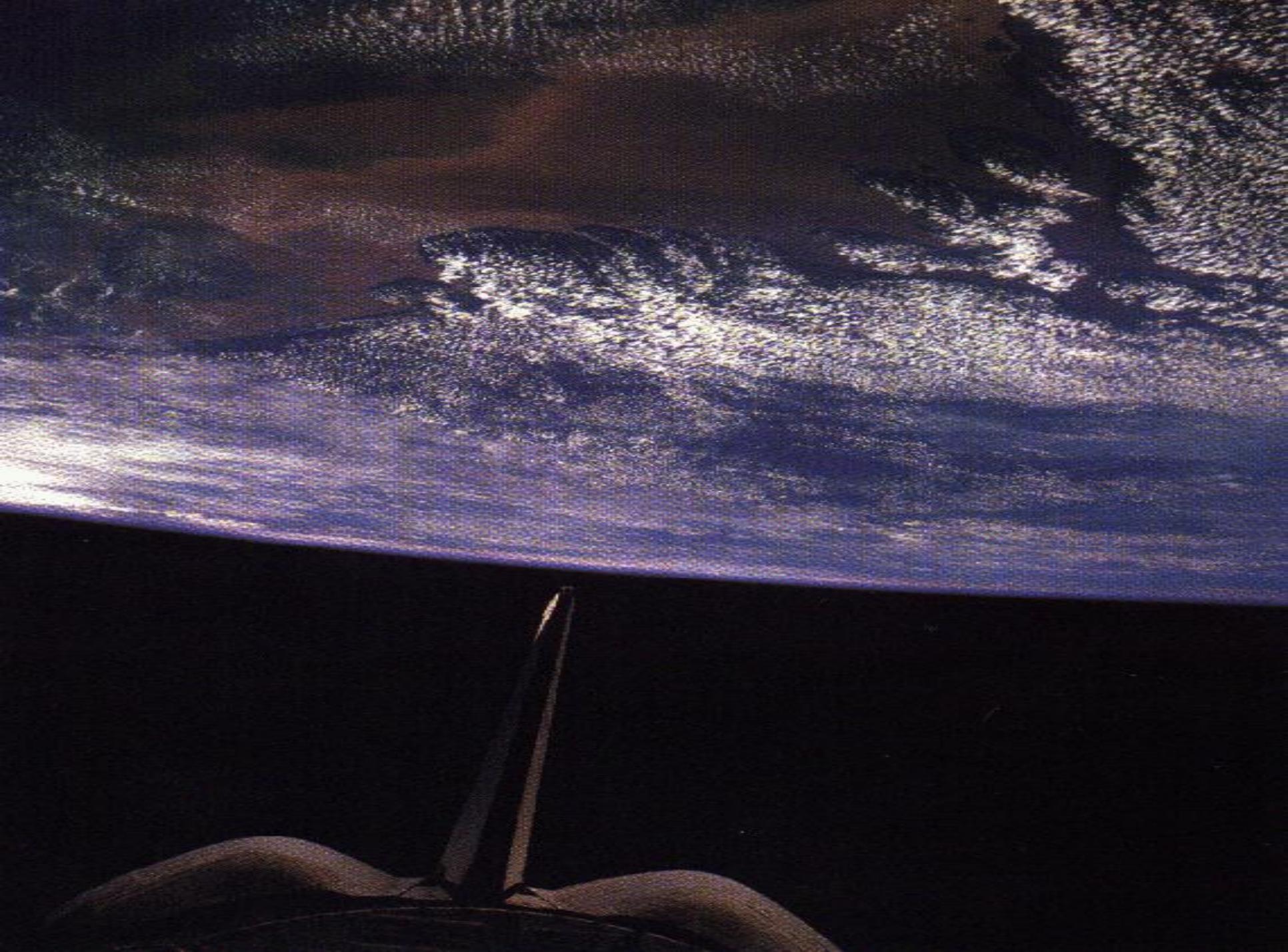
- ❖ Inseminação Artificial: coleta do sêmen por masturbação; preparo seminal em laboratório (processamento seminal) e inseminação intra-uterina
- ❖ Indução da ovulação com medicações hormonais
- ❖ Acompanhamento com ultrassonografia transvaginal e dosagens hormonais



**I U F**  
**CLINIC**

# *Técnicas de Reprodução Assistida*

- Fertilização in vitro: inseminação de cada óvulo com ~50.000 espermatozóides; cultivo dos embriões em laboratório por 2 – 5 dias
- ICSI: injeção de um único espermatozóide dentro do óvulo; cultivo dos embriões em laboratório por 2 – 5 dias
- ❖ Punção dos óvulos sob anestesia geral (sedação); coleta dos espermatozóides por masturbação ou punção / biópsia testicular





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# Técnicas de RA

## Quanto a ORIGEM DO ESPERMATOZÓIDE



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ESPERMATOZÓIDES  
ESPIDIDIMÁRIOS

PERCUTANEOUS  
EPIDYDIMAL  
SPERM  
ASPIRATION



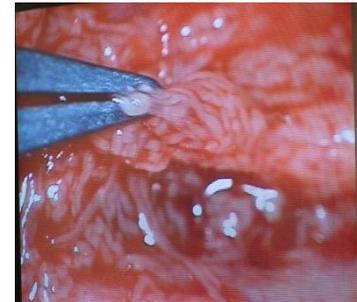
ESPERMATOZÓIDES  
EJACULADOS

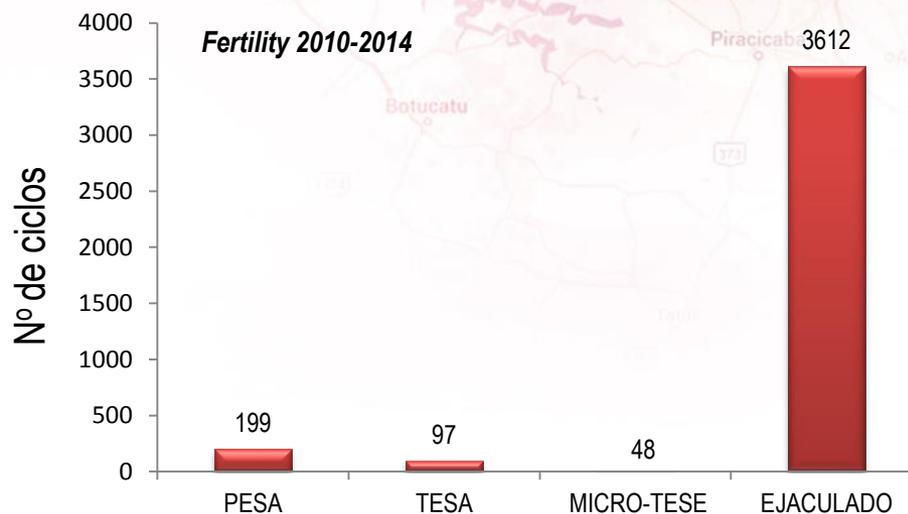
ESPERMATOZÓIDES  
TESTICULARES

TESTICULAR  
SPERM  
ASPIRATION



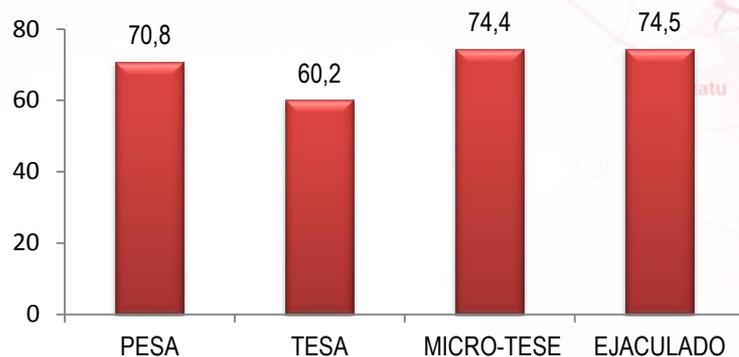
MICRO  
TESTICULAR  
SPERM  
EXTRACTION





Características	PESA	TESA	MICRO-TESE	EJACULADO
Nº de ciclos	199	97	48	3612
Idade média $\pm$ DP	34.9 $\pm$ 4.6	34.8 $\pm$ 5.4	32.2 $\pm$ 2.7	35.8 $\pm$ 4.7
Nº de folículos aspirados $\pm$ DP	20.4 $\pm$ 15.4	18.1 $\pm$ 11.3	15.9 $\pm$ 14.4	15.8 $\pm$ 12.4
Nº de oócitos recuperados $\pm$ DP	14.2 $\pm$ 10.8	13.3 $\pm$ 9.3	11.0 $\pm$ 11.4	11.0 $\pm$ 9.0
Nº de oócitos micromanipulados $\pm$ DP	9.8 $\pm$ 6.4	8.9 $\pm$ 5.1	8.0 $\pm$ 6.9	7.8 $\pm$ 5.8

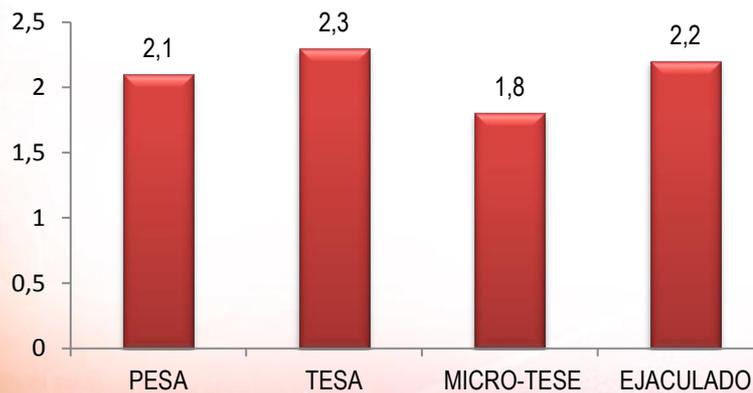
Taxa de fertilização (%)



COMPARAÇÃO	VALOR DE P
PESA VS TESA	< 0.001
PESA VS MICRO-TESE	> 0.05
PESA VS EJACULADO	> 0.05
TESA VS MICRO-TESE	> 0.05
TESA VS EJACULADO	< 0.001
MICRO-TESE VS EJACULADO	> 0.05

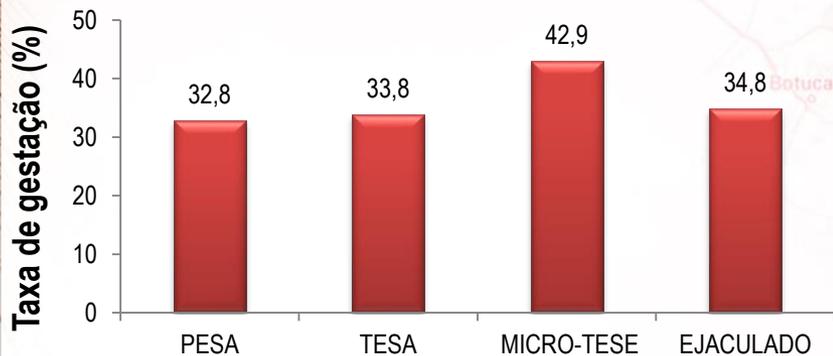
ANOVA

Embrões transferidos



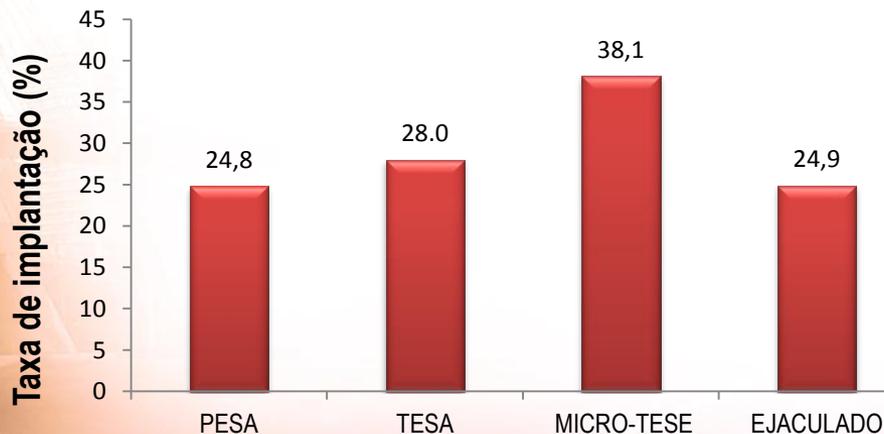
COMPARAÇÃO	VALOR DE P
PESA VS TESA	> 0.05
PESA VS MICRO-TESE	> 0.05
PESA VS EJACULADO	> 0.05
TESA VS MICRO-TESE	> 0.05
TESA VS EJACULADO	> 0.05
MICRO-TESE VS EJACULADO	> 0.05

ANOVA



COMPARAÇÃO	VALOR DE P
PESA VS TESA	> 0.05
PESA VS MICRO-TESE	> 0.05
PESA VS EJACULADO	> 0.05
TESA VS MICRO-TESE	> 0.05
TESA VS EJACULADO	> 0.05
MICRO-TESE VS EJACULADO	> 0.05

#### QUI-QUADRO



COMPARAÇÃO	VALOR DE P
PESA VS TESA	> 0.05
PESA VS MICRO-TESE	> 0.05
PESA VS EJACULADO	> 0.05
TESA VS MICRO-TESE	> 0.05
TESA VS EJACULADO	> 0.05
MICRO-TESE VS EJACULADO	> 0.05

#### ANOVA

Técnica	Nº Ciclos	Ciclos com ausência de espermatozóide	% de falha
PESA	199	27*	13.5
TESA	97	21	22.6
microTESE	48	21	43.8



\* 100%  
após TESA



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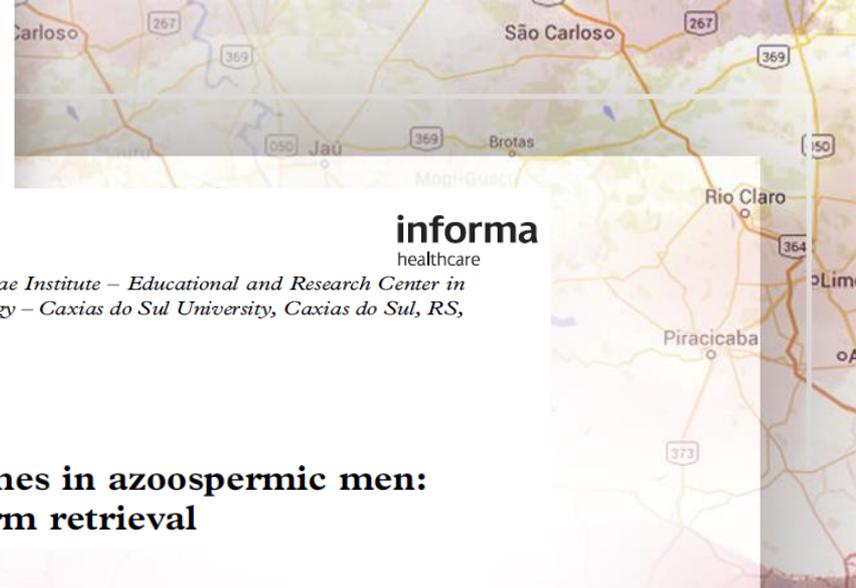
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# Técnicas de RA

## Quanto ao TIPO DE AZOOSPERMIA



*The Aging Male*, 13(1):44-50, 2010

<sup>1</sup>Fertility – Assisted Fertilization Center, São Paulo, SP, Brazil, <sup>2</sup>Sapientiae Institute – Educational and Research Center in Assisted Reproduction, São Paulo, SP, Brazil, and <sup>3</sup>Institute of Biotechnology – Caxias do Sul University, Caxias do Sul, RS, Brazil

**ORIGINAL ARTICLE**

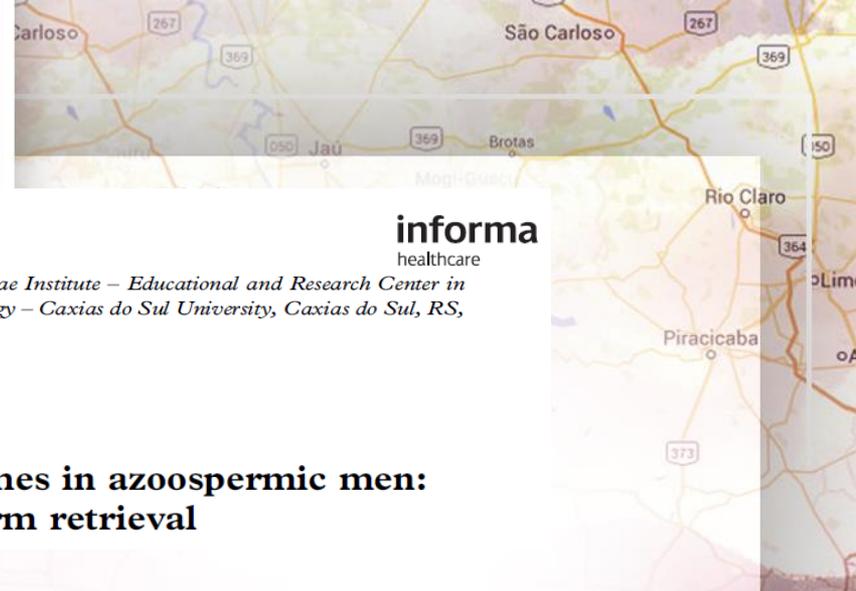
Edson Borges Jr., *et al*

**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 sperm were retrieved from the testicle (TESA) or epididymis (PESA).

Variable	Study group		p value
	OA-TESA (n=103)	OA-PESA (n=171)	
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*, 13(1):44-50, 2010

<sup>1</sup>Fertility – Assisted Fertilization Center, São Paulo, SP, Brazil, <sup>2</sup>Sapientiae Institute – Educational and Research Center in Assisted Reproduction, São Paulo, SP, Brazil, and <sup>3</sup>Institute of Biotechnology – Caxias do Sul University, Caxias do Sul, RS, Brazil

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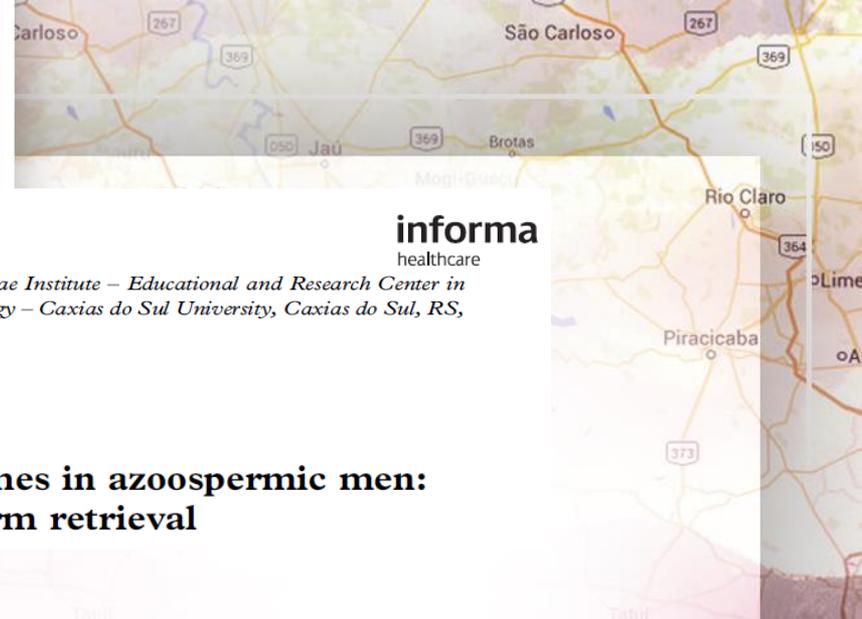
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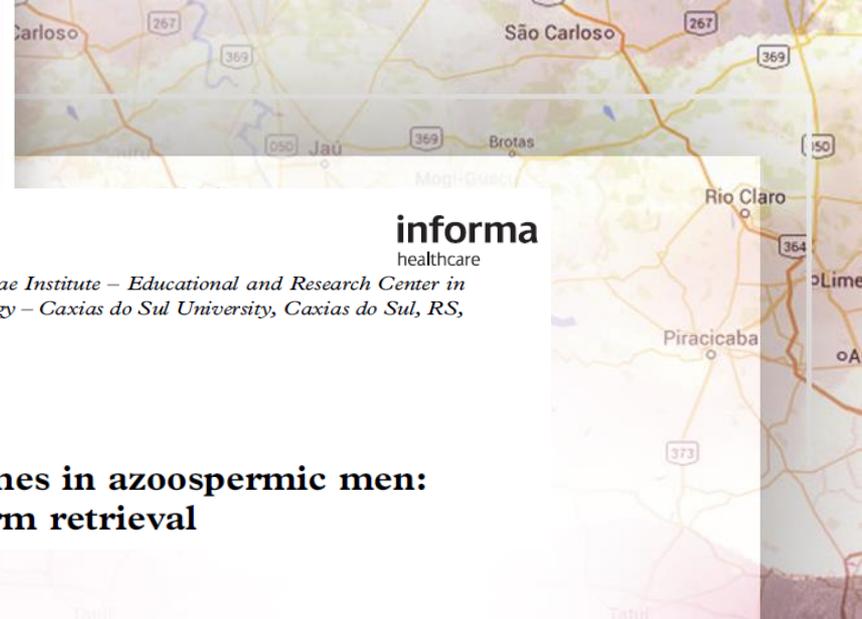
Edson Borges Jr., *et al*

**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.

Variable	Study group		p value
	OA-TESA (n=103)	NOA-TESA (n=102)	
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

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



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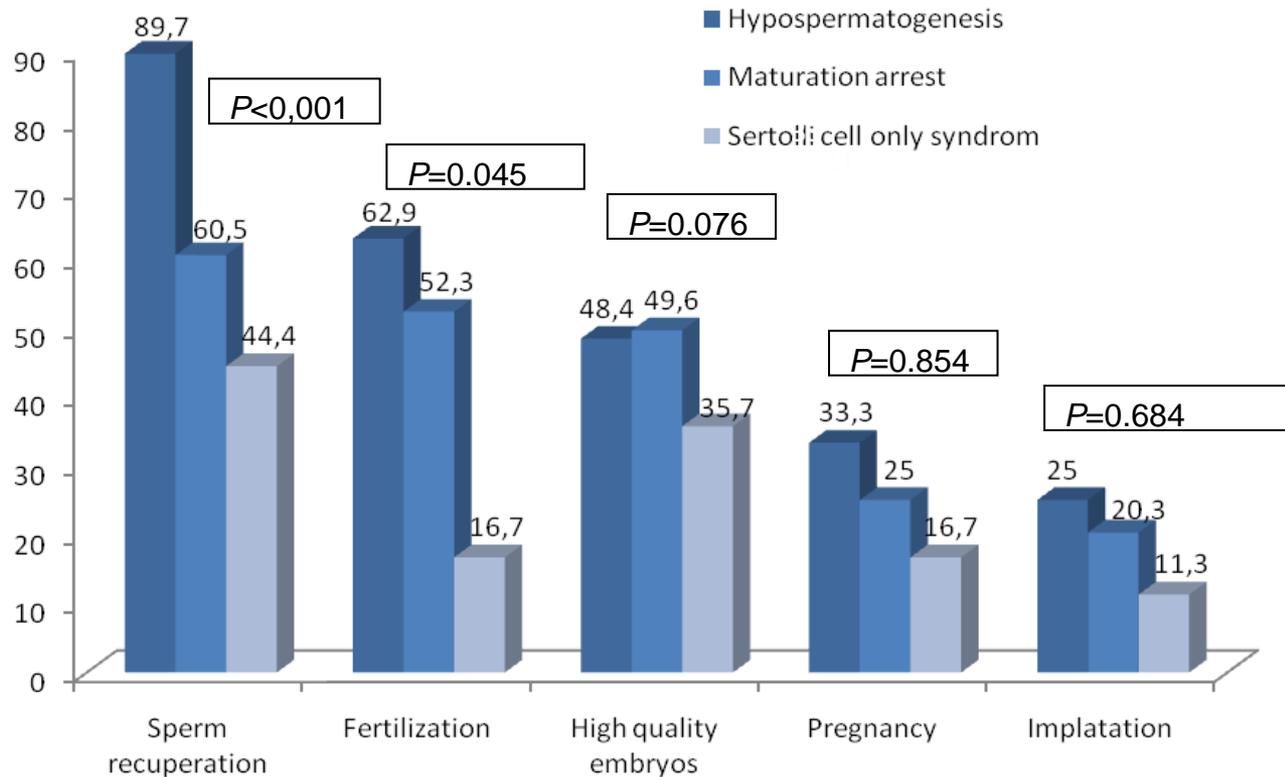
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## The prognostic value of the testicular histopathological pattern for sperm retrieval and intracytoplasmic sperm injection outcomes in non-obstructive azoospermic patients

O valor prognóstico do padrão histopatológico testicular na recuperação de espermatozóides e nos resultados da injeção intracitoplasmática de espermatozóides em pacientes com azoospermia não-obstrutiva

Edson Borges Jr. <sup>a,b</sup>, Daniela Paes de Almeida Braga <sup>a,b</sup>, Rita de Cássia Savio Figueira <sup>a</sup>, Amanda Souza Setti <sup>a</sup>, Assumpto Iaconelli Jr. <sup>a,b</sup>, Fabio Firmbach Pasqualotto <sup>c</sup>





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# Técnicas de RA

## Quanto a FORMA DE DIAGNÓSTICO



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ISSN: 2047-2919

ANDROLOGY

ORIGINAL ARTICLE

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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

Received: 18-Dec-2015

Revised: 8-Mar-2016

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

<sup>1,2\*</sup>E. Borges Jr, <sup>1,2\*</sup>A. S. Setti, <sup>1,2</sup>D. P. A. F. Braga, <sup>1</sup>R. C. S. Figueira and <sup>1,2</sup>A. Iaconelli Jr

➤ **Definição:**  $TMSC = volume \times conc/ml \times \% A+B / 100\%$

- 518 ciclos de ICSI
- OMS / TMSC
- TMSC normal: > 20 milhões

**Correspondence:**  
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and <sup>1,2</sup>A. Iaconelli Jr

- Grupo I: TMSC < 1 milhão de espermatozóides
- Grupo II: TMSC 1 - 5 milhões de espermatozóides
- Grupo III: TMSC 5 - 10 milhões de espermatozóides
- Grupo IV: TMSC 10 - 20 milhões de espermatozóides
- Grupo V: TMSC > 20 milhões de espermatozóides



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- **OMS: 518 (100%) fator masculino**
  - **Oligozoospermia: 148**
  - **Astenozoospermia: 106**
  - **Teratozoospermia: 361**

## ● **TMSC**

- **normal: 190 (36,7%): ausência de fator masculino**
- **anormal: 328 (63,3%): fator masculino presente**

**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 <sup>2</sup>	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
Formation of high-quality zygotes on D1	Normal TMSC	-0.253	0.1%	0.592
	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
Formation of high-quality embryos on D2	TMSC	1.13	1.01-1.28	0.049
	Normal TMSC	0.99	0.97-1.02	0.629
	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
Formation of high-quality embryos on D3	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
	Concentration	0.91	0.79-1.06	0.229
	Motility	0.93	0.79-1.09	0.379
Formation of blastocyst on D5	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
	Concentration	1.11	0.97-1.27	0.116
Blastocyst expansion grade on D5	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
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

**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.



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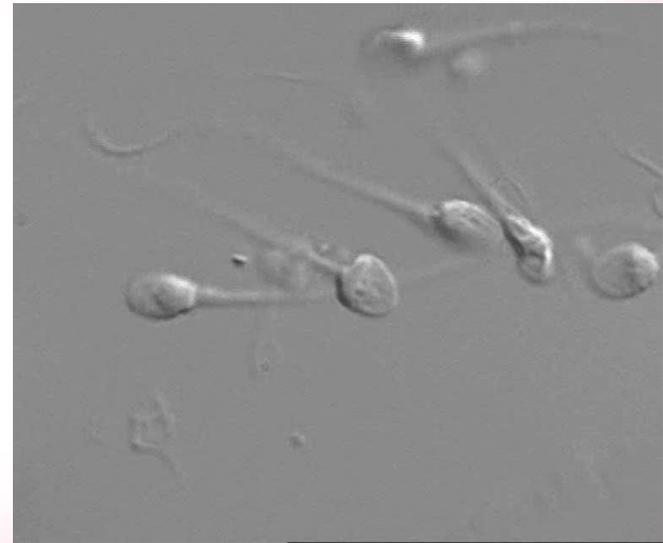
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# Técnicas de RA

## Quanto a FORMA DE AVALIAÇÃO

# MSOME Motile Sperm Organellar Morphology Examination

# IMSI Intracytoplasmic Morphologically Select Sperm Injection





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Reproductive BioMedicine Online (2010) 21, 450–455



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[www.sciencedirect.com](http://www.sciencedirect.com)  
[www.rbmonline.com](http://www.rbmonline.com)



## REVIEW

# Intracytoplasmic sperm injection outcome versus intracytoplasmic morphologically selected sperm injection outcome: a meta-analysis

Amanda Souza Setti <sup>a</sup>, Renata Cristina Ferreira <sup>b</sup>,  
Daniela Paes de Almeida Ferreira Braga <sup>a,b</sup>, Rita de Cássia Sávio Figueira <sup>a,b</sup>,  
Assumpto Iaconelli Jr <sup>b</sup>, Edson Borges Jr <sup>a,b,\*</sup>



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European Journal of Obstetrics & Gynecology and Reproductive Biology 183 (2014) 96–103



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## European Journal of Obstetrics & Gynecology and Reproductive Biology

journal homepage: [www.elsevier.com/locate/ejogrb](http://www.elsevier.com/locate/ejogrb)



### Review

Intracytoplasmic morphologically selected sperm injection results in improved clinical outcomes in couples with previous ICSI failures or male factor infertility: a meta-analysis



Amanda S. Setti<sup>a,b,c</sup>, Daniela P.A.F. Braga<sup>a,b</sup>, Rita C.S. Figueira<sup>b,c</sup>, Assumpto Iaconelli Jr.<sup>a,b</sup>,  
Dr. Edson Borges<sup>a,b,\*</sup>

<sup>a</sup> Instituto Sapientiae—Centro de Estudos e Pesquisa em Reprodução Assistida, Rua Vieira Maciel, 62, São Paulo 04503-040, SP, Brazil

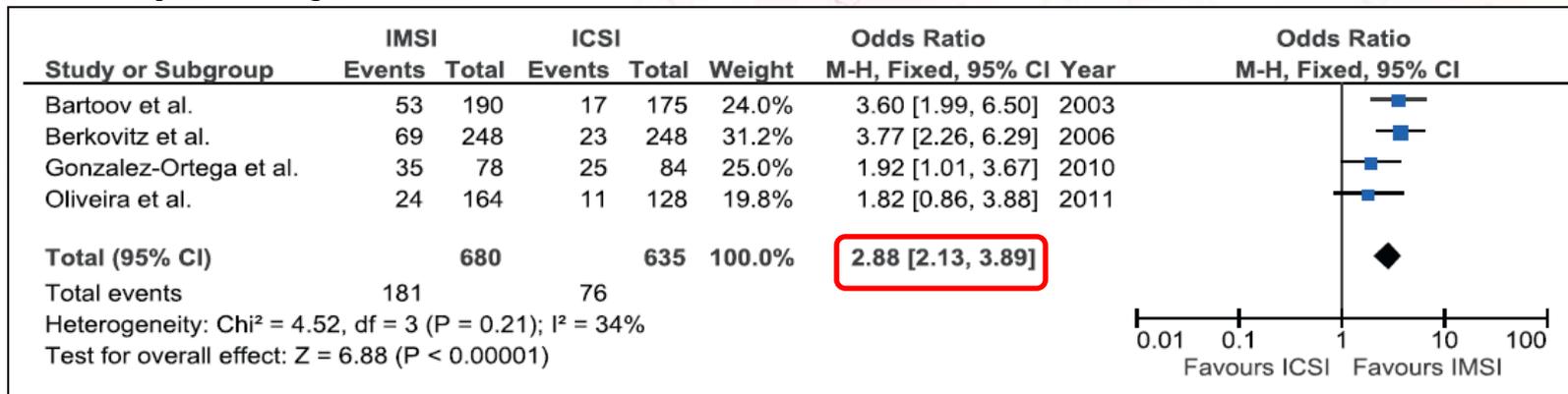
<sup>b</sup> Fertility—Centro de Fertilização Assistida, Av. Brigadeiro Luis Antonio, 4545, São Paulo 01401-002, SP, Brazil

<sup>c</sup> Faculdade de Ciências Médicas da Santa Casa de São Paulo, Rua Dr. Cesário Motta Junior, 61, São Paulo 01221-020, SP, Brazil

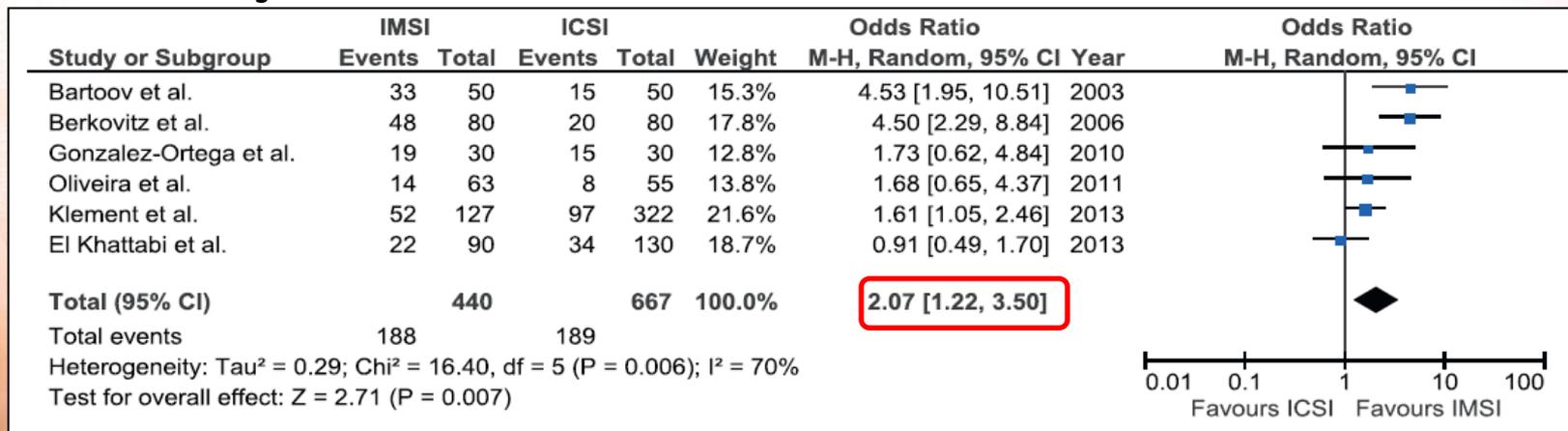
Premiado pela Sociedade de Tecnologia em Reprodução Assistida (SART) como melhor trabalho apresentado no 69º encontro anual da Sociedade Americana de Medicina Reprodutiva, 2013 (ASRM)

## Implantação

## Casais com falha prévia de ICSI (FI)

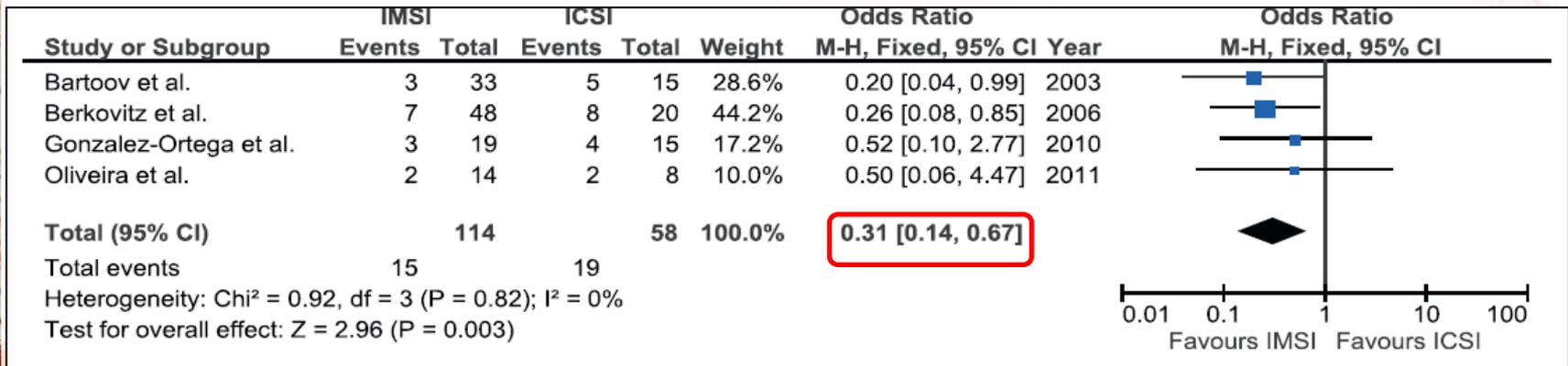


## Gestação



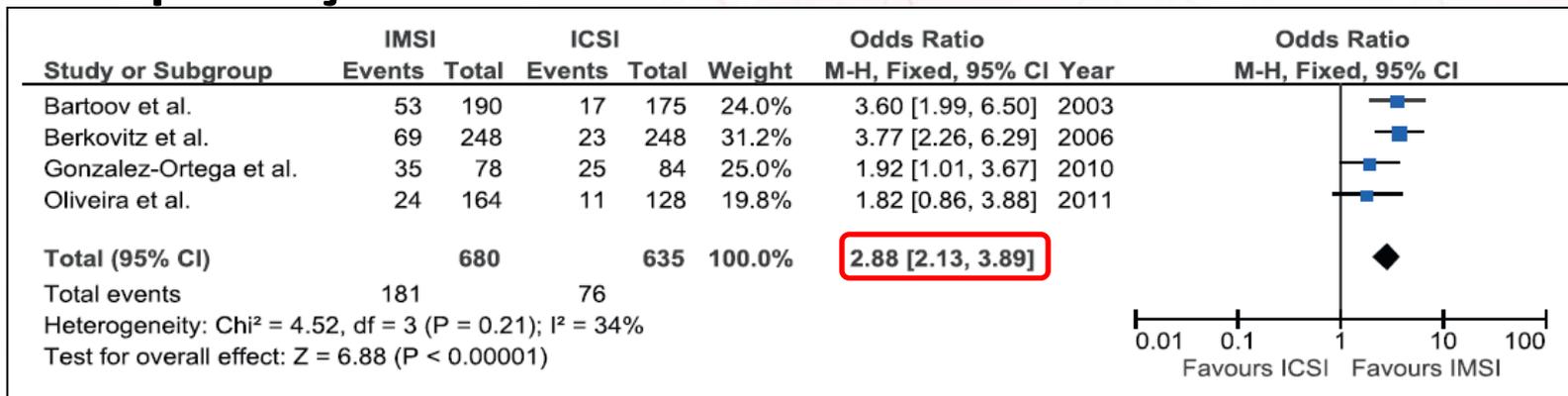
## Casais com falha prévia de ICSI (FI)

### Aborto

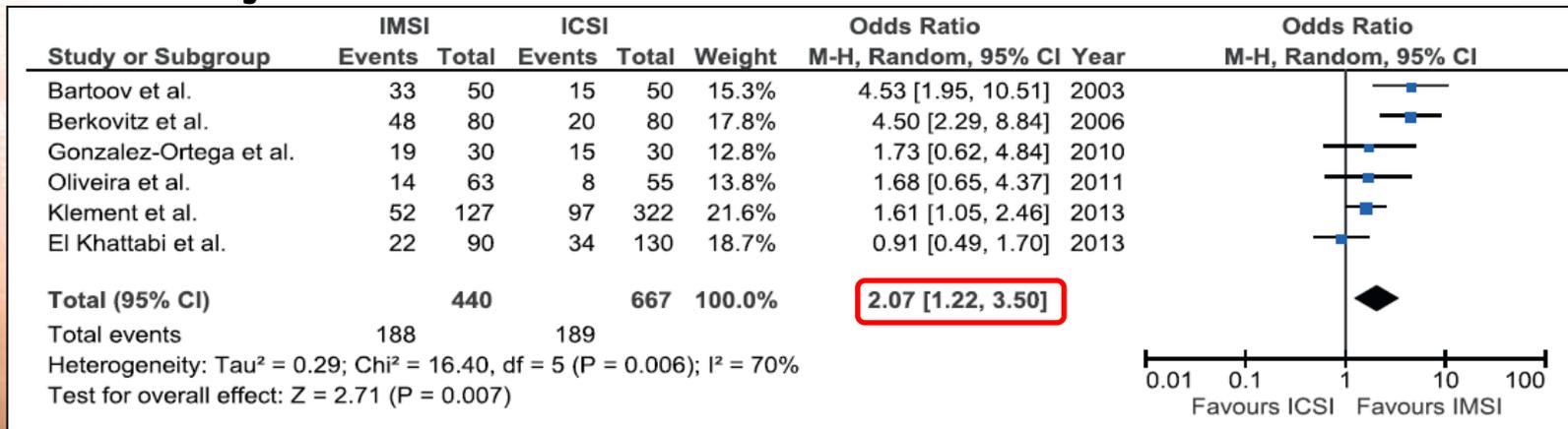


## Implantação

# Casais com fator masculino



## Gestação



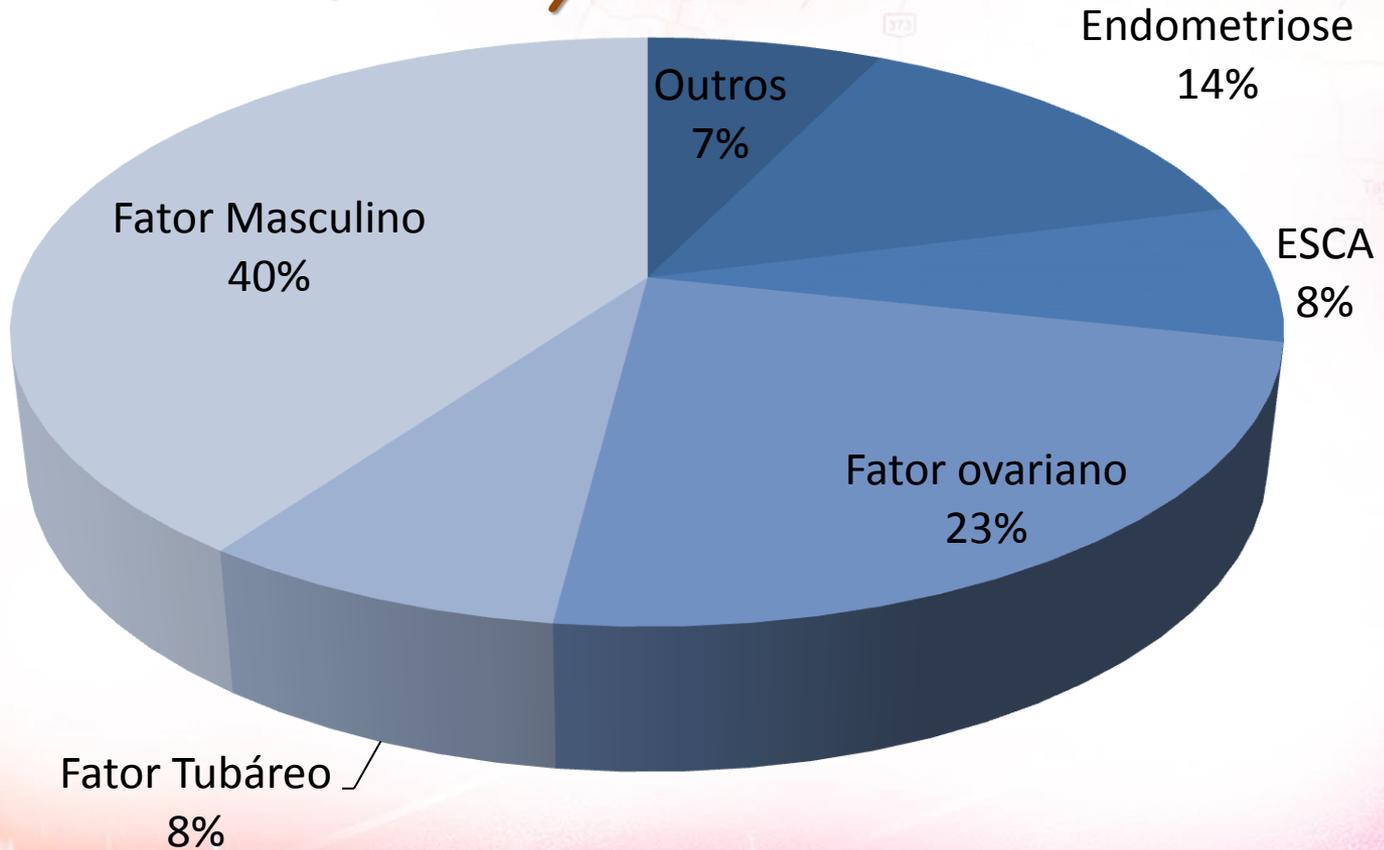


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## Disstribuição dos casos de Infertilidade Fertility 2005 - 2015





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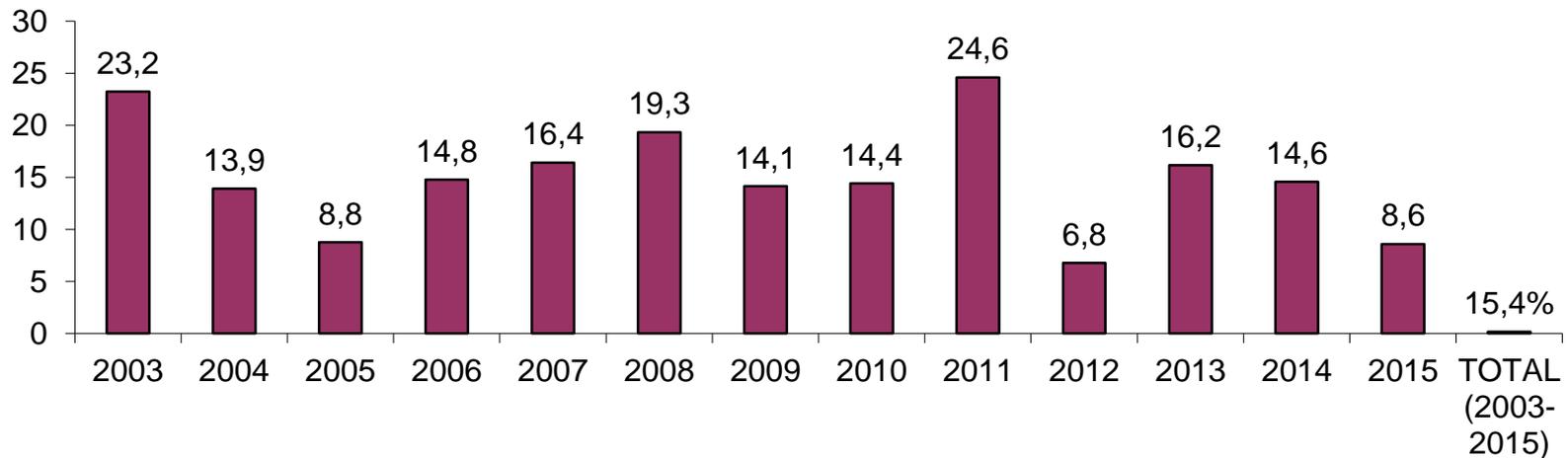
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# Fertility Medical Group

## RESULTADOS - IIU

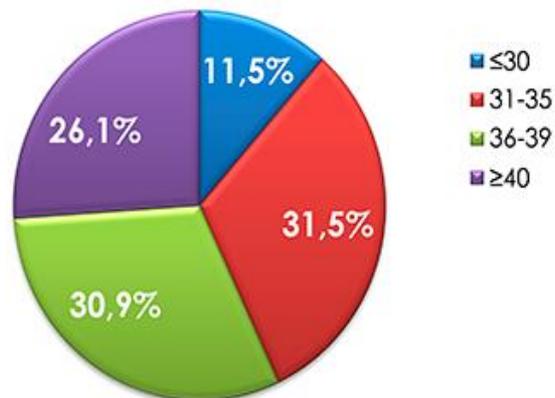
### Taxa Gestação (%)



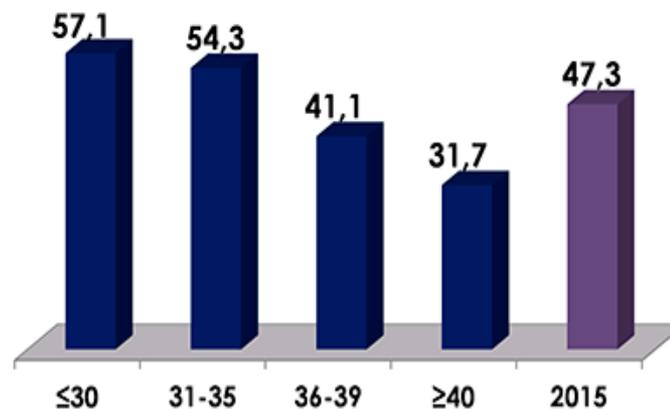
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## RESULTADOS - ICSI

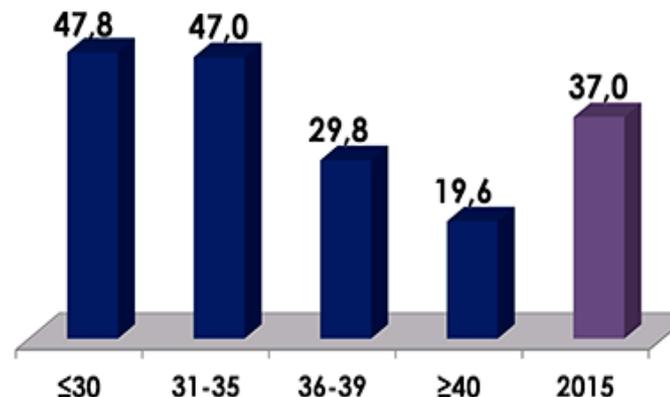
Distribuição dos ciclos de ICSI 2015



(A) Taxa de gestação / ciclo transferido (%)



(B) Taxa de implantação (%)





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# Obrigado

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