

**OUTCOME OF TREATMENT FOR OAT SYNDROME  
BY INTRACYTOPLASMIC SPERM INJECTION  
AT THE ART CENTER**

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# INTRODUCTION



Infertility rate  
in the world:  
8%-12% (60-  
80 million  
people)

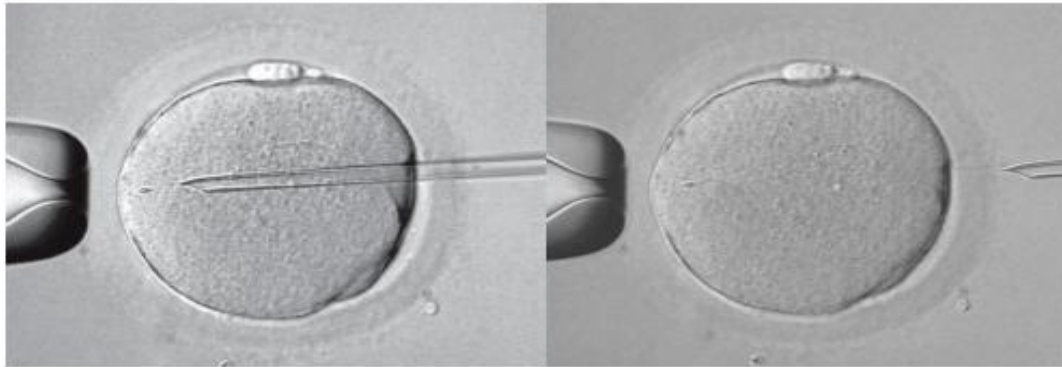


Tremellen:  
1/20 men  
are  
involved in  
infertility



OAT  
accounted  
for 34.6%  
male  
infertility

# INTRODUCTION



ICSI: Palermo reported the first case in 1992



Just 1 sperm is enough to fertilize with 1 oocyte →  
Fertilization rate 70%.



The effect of ICSI with severe abnormal sperm  
(OAT syndrome)?

# OBJECTIVE

Evaluate the outcome of treatment for OAT syndrome by Intracytoplasmic Sperm Injection at the Assisted Reproductive Technology Central

# BACKGROUND

- OAT (oligo-astheno-teratozoospermia): total number (or concentration) of spermatozoa, percentages of both progressive (PR), & normal morphology spermatozoa, below lower reference limits (WHO 2010).
- Pang (1999): OAT males were high rates of chromosome disomy
- Liu (2004): spermatozoa in OAT patients contain DNA fragmentation, mitochondrial dysfunction, chromosomal aneuploidy compare with normozoospermic patients → affects capability of sperm to activate egg trigger formation & development of normal zygote → Low fertilization & pregnancy rates.

# BACKGROUND

- Aurélie Charpuis et al (2017): In ICSI cycles
  - ❖ Lower the sperm concentration → lower fertilization & formation rate .
  - ❖ Fertilization rate reduced in PR < 32% group compare to PR > 32% group
- James M Hotaling (2010): Isolated teratozoospermia was not associated with pregnancy rate.
- Sidney Verza (2008): in ICSI cycles fertilization rate, blastocyst formation and pregnancy rate in OAT patients were lowest compare to normal spermogram, single or double spermogram index abnormal group.

# MATERIALS AND METHODS

Retrospective study from 01/2015 – 12/2016, 140 infertility couples due to husband having OAT were IVF/ICSI at the ART Center meet the eligibility criteria:

## Male

sperm concentration  
<  $15 \times 10^6$ /ml

Sperm count <  $39 \times 10^6$

Progressive motility  
(PR) < 32%

Normal morphology  
sperm < 4%

## Female

$\leq 35$  years old

Normal ovarian reserve

Normal uterus

No hydro-salpinx

# RESEARCH PROCESS DIAGRAMS

Infertile couples due to husband having OAT fit the selection criteria (n = 140)

First IVF/ICSI cycle (n = 140)

Clinical pregnancy  
(n = 73)

Non-clinical pregnancy (n = 67)

2<sup>nd</sup> IVF/ICSI cycle (n = 20)

Clinical pregnancy  
(n = 4)

Non-clinical pregnancy (n = 16)

3<sup>rd</sup> IVF/ICSI (n = 4)

Clinical pregnancy  
(n = 3)

Non-clinical pregnancy (n = 1)



# MATERIALS AND METHODS

## Study variables and indexes

### Patient characteristics

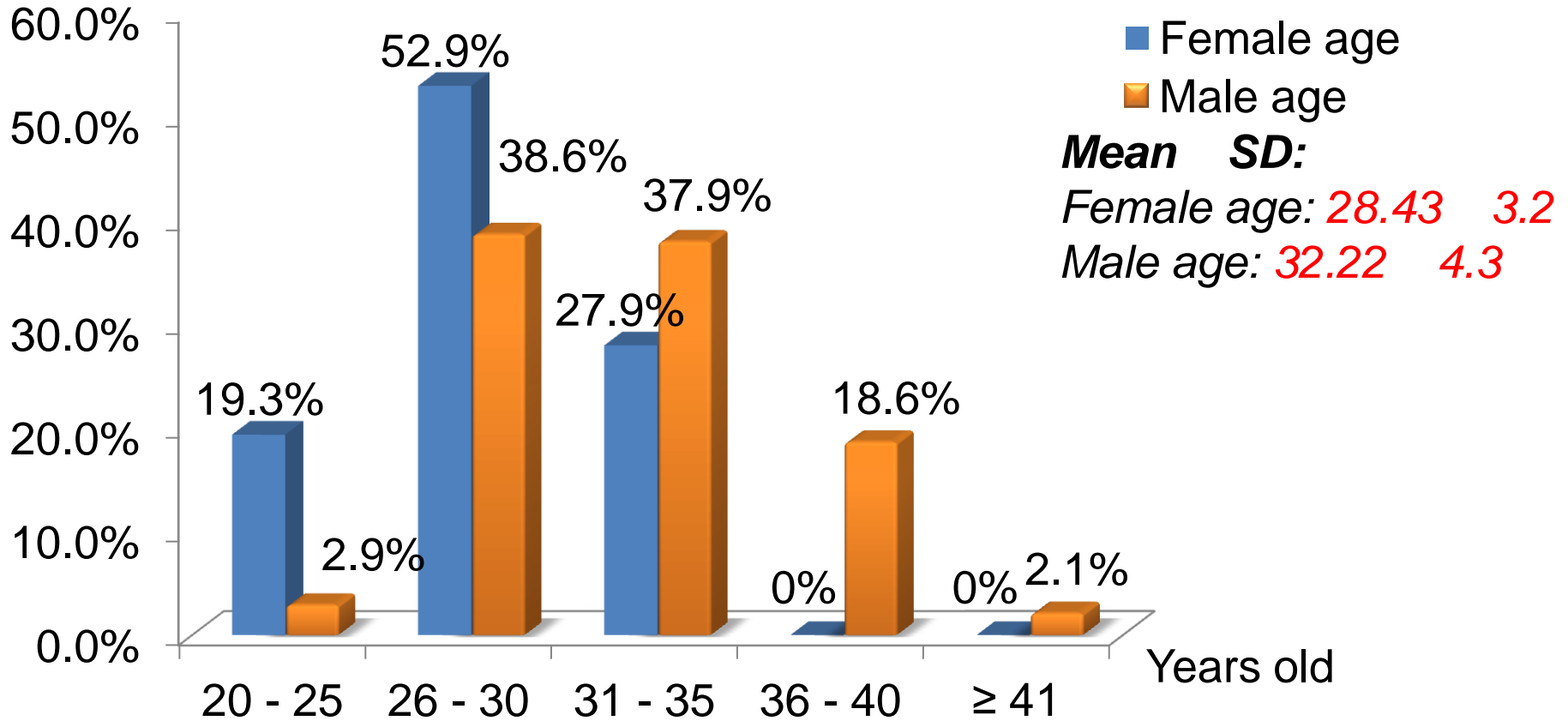
- Male & female age, infertility duration, semen parameters

### Results of IVF/ICSI

- **ICSI:** number of retrieved oocytes, number of ICSI oocytes, fertilization rate per oocyte, number of embryos
- **Embryo transfer:** number of transfer embryos, implantation rate, pregnancy rate, number of pregnancies
- **Pregenancy:** pregnancy progresses, give birth, miscarriage, GEU

# RESULTS

## ❖ Age groups



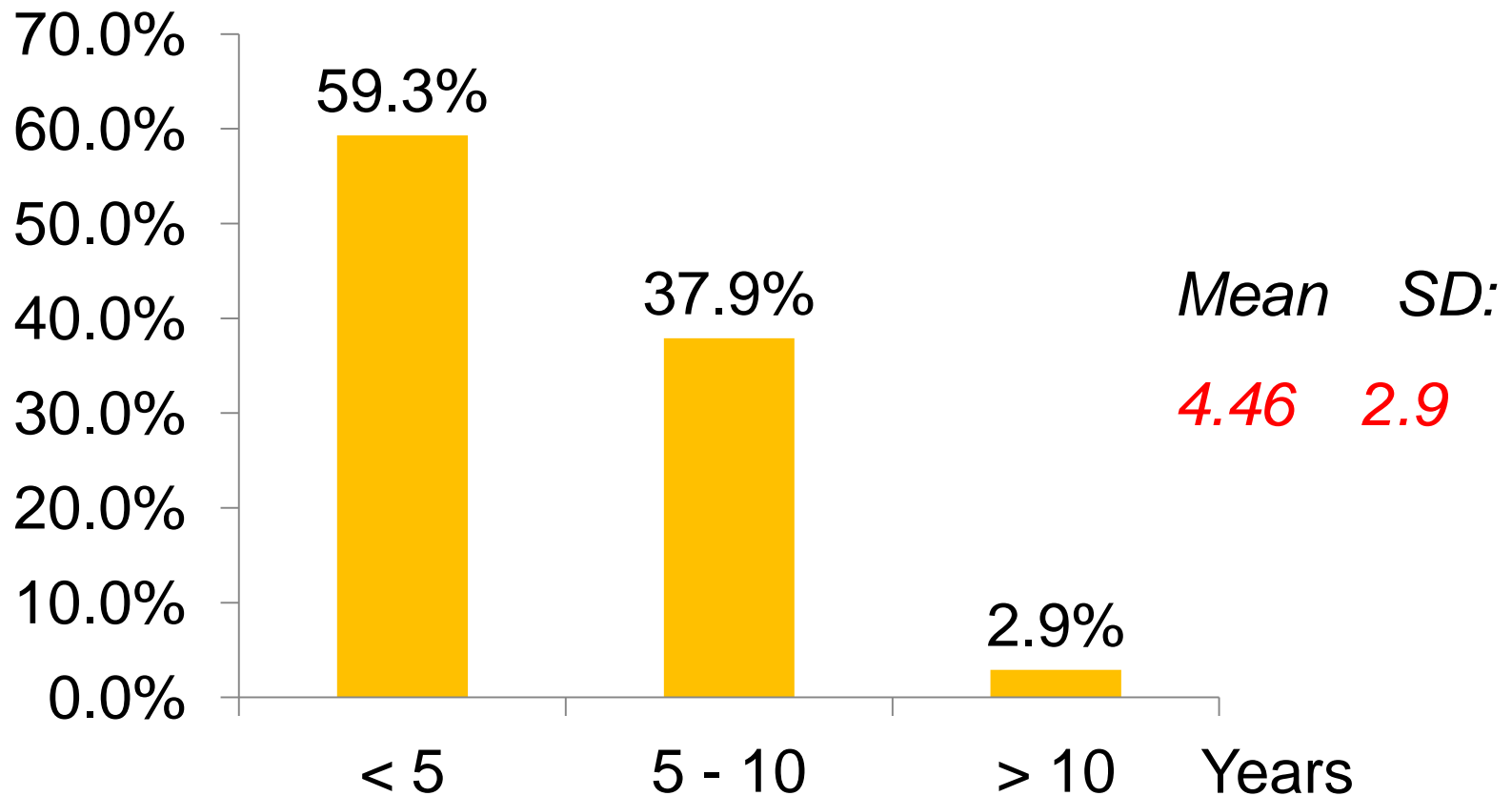
Bhilwadikar R: female age 34.4 0.2; male age: 34.1 0.3.

Turhan N: female age: 28.97 3.7 – 28.82 4.0

male age: 33.05 5.3 – 32.55 4.7

# CHARACTERISTICS OF THE RESEARCH OBJECT

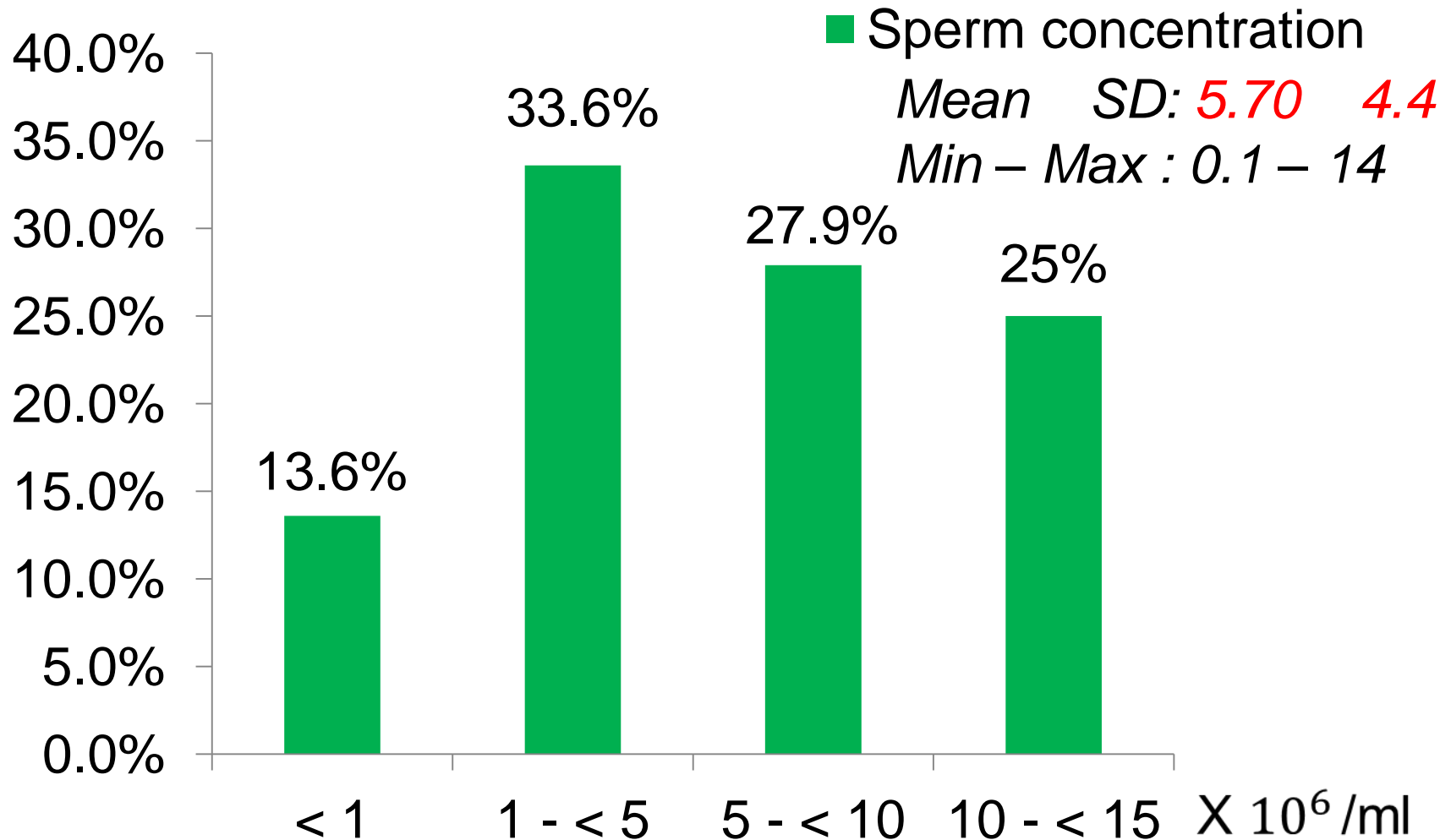
## ❖ Infertility duration



Ho Sy Hung: 3.97 3.4. Han Manh Cuong: 5.1 3.6 – 6.0 3.4. Turhan N: 5.21 3.6 – 4.68 2.9

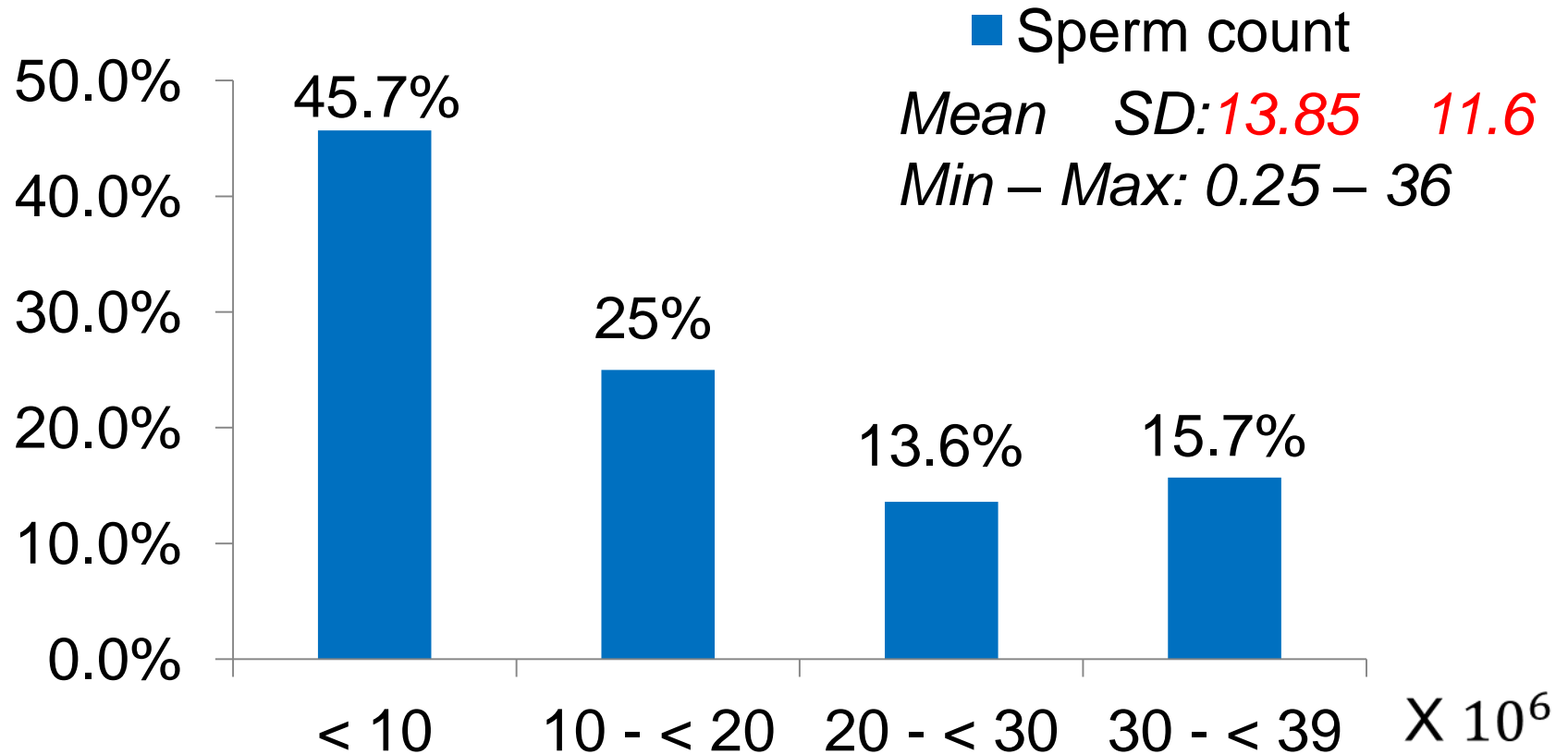
# CHARACTERISTICS OF THE RESEARCH OBJECT

## ❖ Sperm concentration



# CHARACTERISTICS OF THE RESEARCH OBJECT

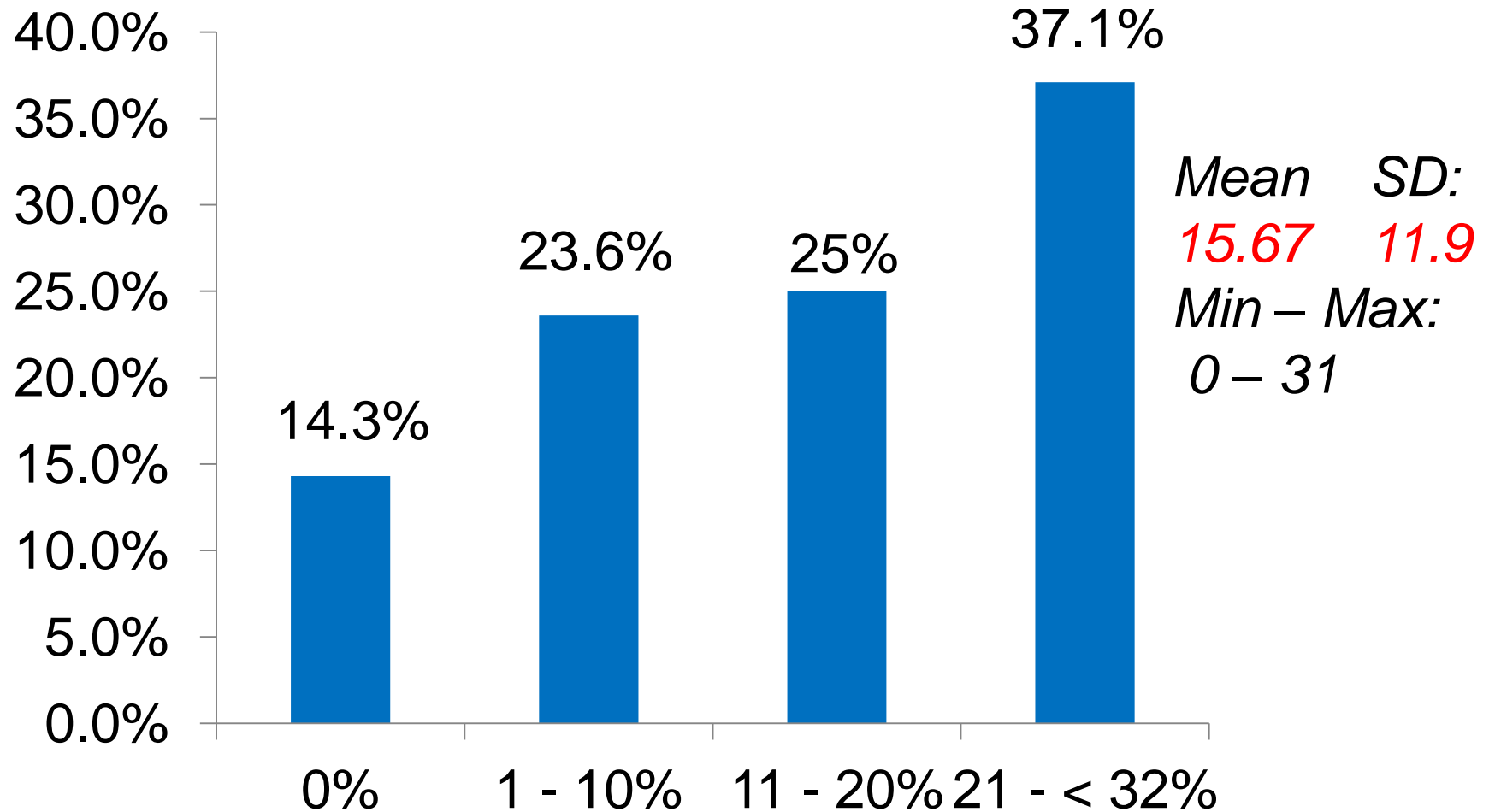
## ❖ Sperm count



Bhilawadikar R (2013): 10.3 0.4

# CHARACTERISTICS OF THE RESEARCH OBJECT

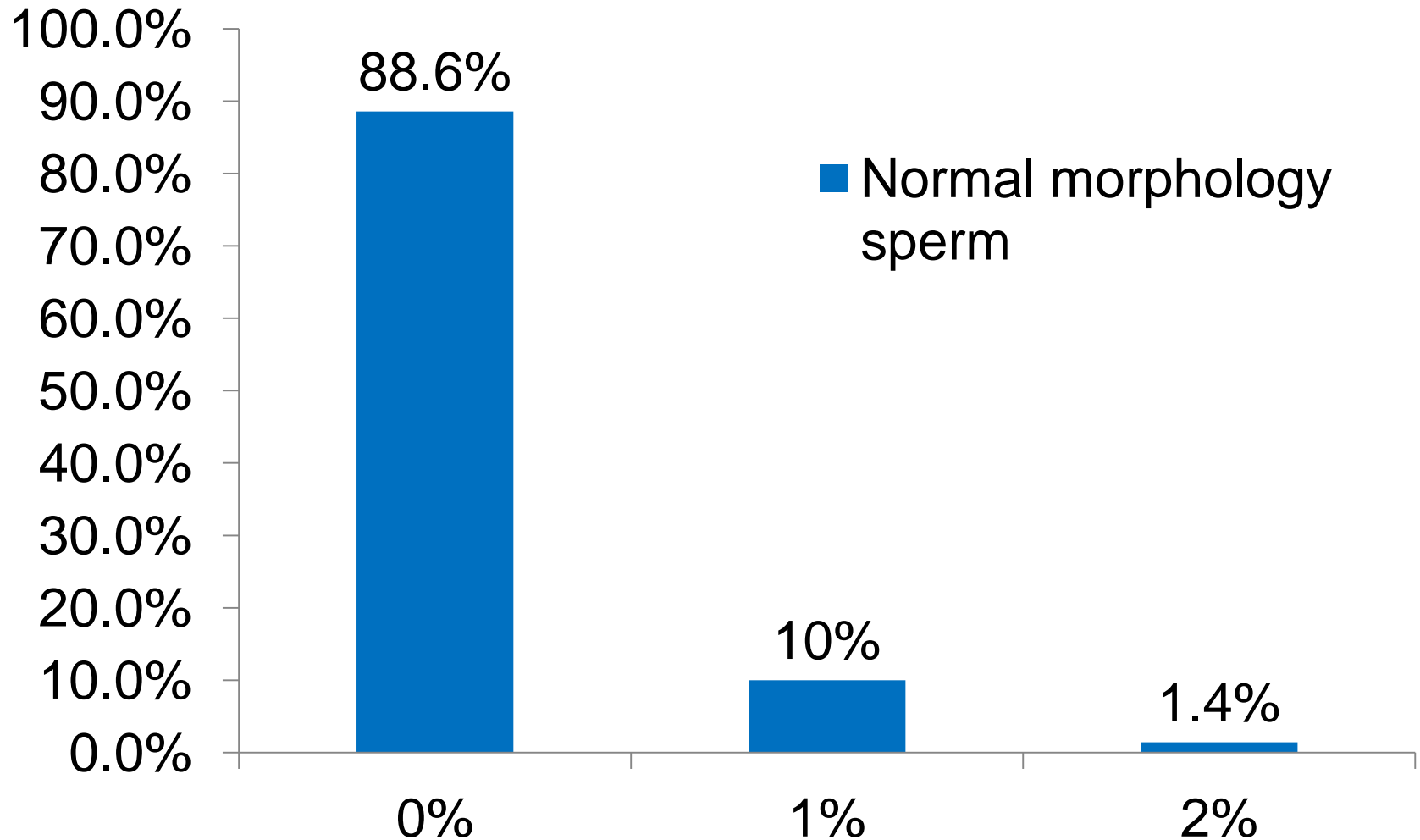
## ❖ Progressive motility



Bhilawadikar R (2013): 7.5 0.4

# CHARACTERISTICS OF THE RESEARCH OBJECT

## ❖ Normal morphology sperm



# RESULTS OF ICSI & EMBRYO TRANSFER

## ❖ According to sperm concentration

Index \ Sperm con (x 10 <sup>6</sup> /ml)	≤ 0,2 (n=10)	0,2 – 5 (n=73)	5 – < 15 (n=57)	General (n=140)	p
No. of cycles	15	85	64	164	
No. of oocytes ICSI	10.73 3.4	9.39 5.3	11.47 6.5	10.32 5.7	0.08
No. of fertilization oocytes	8.53 3.2	7.53 4.8	9.27 4.8	8.30 4.7	0.081
Fertilization rate (%)	79.66 16.8	81.33 20.7	83.26 15.5	81.93 18.5	0.73
No. of embryos formation	8.07 3.4	6.55 3.8	8.38 4.4	7.40 4.1	<u>0.021</u>
No. of transferred embryos	3.09 0.8	3.05 0.8	3.16 0.8	3.10 0.7	0.54
Implantation rate (%)	7.58 15.0	13.71 22.1	22.49 27.0	16.53 24.1	<u>0.007</u>
Clinical pregnancies (n, %)	4 (26.67%)	36 (42.35%)	40 (62.5%)	80 (48.78%)	<u>0.027</u>

- Fertilization rate (%): Aurélie Charpuis 58.3; 61.9; 65.3; p < 0.0001; Hyung Jun Kim 65.0 21.1 – 67.7 19.9. Sidney Verza 63.4 26.9.

- Clinical pregnancies rate (%) - Aurélie Charpuis 35.3; 41.3; 39.6; p > 0.05.



# RESULTS OF ICSI & EMBRYO TRANSFER

## ❖ According to progressive motility

Index \ PR (%)	0 (n=20)		1 – 10 (n=57)		11 – 20 (n=23)		21 – < 32 (n=40)		p
No. of cycles	24		63		30		47		
No. of oocytes ICSI	12.29	5.2	10.75	6.2	8.87	4.4	9.68	5.8	0.12
No. of fertilization oocytes	9.29	4.3	8.48	5.2	7.70	4.3	7.94	4.5	0.59
Fertilization rate (%)	78.39	21.0	79.07	19.4	86.45	18.3	84.67	15.4	0.16
No. of embryos formation	7.92	3.5	7.44	4.4	6.63	3.3	7.56	4.4	0.68
No. of transferred embryos	3.21	0.8	3.06	0.7	3.03	0.8	3.11	0.7	0.72
Implantation rate (%)	14.32	23.9	18.87	24.0	18.80	26.6	13.58	22.7	0.51
Clinical pregnancies (n, %)	12 (50%)		34 (53.97%)		15 (50%)		19 (40.43%)		0.23

# RESULTS OF ICSI & EMBRYO TRANSFER

## ❖ According to morphology sperm

Morphology sperm Index	Non normal morphology sperm	Have normal morphology sperm	p
No. of cycles	148	16	
No. of oocytes ICSI	10.48 5.9	8.88 3.1	0.087
No. of fertilization oocytes	8.39 4.9	7.44 2.2	0.169
Fertilization rate (%)	81.54 18.9	85.50 14.3	0.418
No. of embryos formation	7.46 4.3	6.88 2.3	0.389
No. of transferred embryos	3.10 0.8	3.10 0.6	0.984
<b>Implantation rate (%)</b>	<b>14.78 22.8</b>	<b>33.75 29.8</b>	<b><u>0.011</u></b>
<b>Clinical pregnancies (n, %)</b>	<b>68 (45.95%)</b>	<b>13 (81.25%)</b>	<b><u>0.007</u></b>

# RESULTS OF CLINICAL PREGNANCY

❖ After each pick up ovum cycles

		Clinical pregnancy (n; %)	Total
<b>Fresh embryos transfer (n = 137)</b>	First cycle (n = 115)	49 (42.61%)	54 (39.42%)
	2rd cycle (n = 19)	4 (21.05%)	
	3rd cycle (n = 3)	1 (33.33%)	
<b>Frozen embryos transfer (n = 80)</b>		26 (32.5%)	
<b>Cumulative pregnancy</b>		80 (48.78%)	

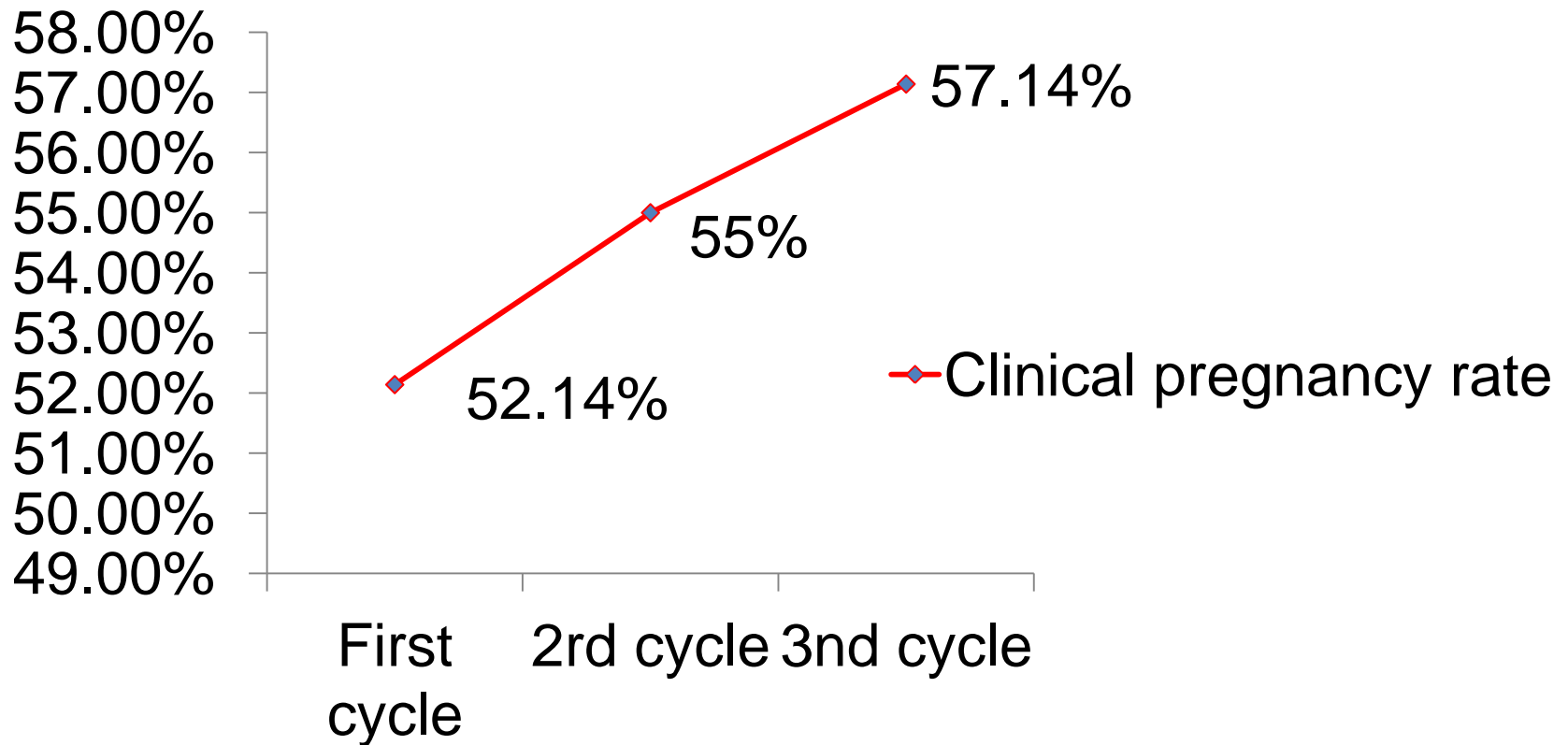
Bhilawadikar R: 12.12%. Turhan N: 47.5%.

Hyung Jun Kim: 12.5% - 33%. Calogero: 39%.

Sidney Verza: 51%

# RESULTS OF CLINICAL PREGNANCY

## ❖ Cumulative pregnancy rate/patients after 3 cycles IVF/ICSI



Ho Sy Hung (2014): 38.8%; 46.47%; 48.24%

# RESULTS OF CLINICAL PREGNANCY

## ❖ Pregnancy gestation

Results	Number	Percen (%)
Pregnancy progresses	23	28.8
Give birth	39	48.7
Miscarriages	14	17.5
GEU	4	5.0
<b>Total</b>	<b>80</b>	<b>100</b>

Ho Sy Hung: pregnancy progresses + give birth= **86.1%**  
(ours: 77.7%), miscarriages: **13.9%** (17.5%)

# CONCLUSION

- Mean fertilized oocytes was of : 8.30 4.7
- Mean fertilization rate : 83.21 25.2%
- Average implantation rate was : 16.76 24.2%
- The clinical pregnancy rate: 48.78% & cumulative pregnancy rate: 57.14%
- Number of embryos formation, implantation rate, results of clinical pregnancies related to sperm concentration & morphology

**THANK YOU FOR LISTENING !**

