THE IMPACT OF INCREASED SERUM PROGESTERONE LEVEL ON DAY OF HCG INJECTION IN ICSI CYCLES ON CLINICAL PREGNANCY RATE

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INTRODUCTION

There has been a long debate about the significance of premature progesterone (P) rise during the late follicular phase, commonly known as premature luteinization (PL), and its implication on assisted reproductive technology (ART) outcomes.

PL is usually defined as an elevation of serum P ≥1.5ng/ml in the follicular phase before triggering administration for final oocyte maturation in controlled ovarian stimulation (COS) cycles.

PL is not uncommon and could not be completely prevented by the use of either gonadotropin-releasing hormone GnRH agonist or GnRH antagonist regimens.

PL could be detected in all profiles of patients undergoing COS such as hyper-responders, normal responders, and poor responders, and single in vitro fertilization (IVF) cycle can be exempted from it.

It has been reported that PL could affect about 12.3% to 46.7% of fresh IVF cycles[4]. This wide range of incidence of PL could be attributed to the heterogeneity of methods, cut-off points, and even definitions used to diagnose PL.

Also, various risk factors could affect the incidence such as a history of recurrent IVF failure, and patient characteristics including age, ethnicity, and body mass index. The COS protocol, daily follicle-stimulating hormone (FSH) dose, total dose of gonadotrophins, duration of the COS cycles, number of retrieved oocytes, and peak estradiol level ,were assumed to be contributory for increasing the chance of prematurely elevated (P) For example, ovarian stimulation using recombinant FSH alone without luteinizing hormone (LH) seems to be risky for higher PL incidence.

AIM OF THE WORK

Objective: Evaluate the effect of increased serum progesterone levels at the time of HCG trigger on the outcome of fresh ICSI cycles.

PATIENTS AND METHODS

PATIENTS: This retrospective case control study will include 150 female patients who will undergofresh ICSI cycles.

Inclusion criteria:

- Patients with increased progesterone level at day of HCG administration
- Fresh ICSI cycles
- Age group 20-37 years old

Exclusion criteria:

-BMI<35.
- Patients with history of failedICSI.
- Poor ovarian reserve.

METHODS: This retrospective case control study will be conducted on 150 patients who will undergo fresh IVF cycles.

The data will be collected from patients reports.

The first group consisted of women undergoing ICSI complicated by premature luteinization during controlled ovarian stimulation (n=75, P ≥1.5 ng/ml).

The controls will be represented by women undergoing ICSI not complicated by high progesterone levels at induction or time of trigger (n=75, P < 1.5 ng/ml).

For both group serum progesterone level was measured on the day of hCG administration and the fertilization rate, cleavage rate, implantation rate, clinical pregnancy rate, ongoing pregnancy rate and Top-Quality Embryos (TQE) rates will be compared.

Grouping of patients as regard progesterone level at time of HCG trigger:

Group A: low level p4< 1.5ng/dl. **Group B: high level P4 >1.5ng/dl**

Data collection: Data were obtained from computerized data base .patients characteristics were recorded including age, BMI, infertility diagnosis, infertility type, basal FSH, E2 level, LH, P4 level, no. and quality ofoocyte retrieved, no. and quality of embryo transfer and clinical pregnancy rate.

RESULTS

Table 1: Comparison between the two studied groups according to patient characterstics.

	Group 1 (n=75)		Group 2 (n=75)		t	p
Age (years)						
Min. – Max.	25.0 – 37.0		25.0 – 37.0		0.423	0.673
Mean ± SD.	30.51 ± 3.62		30.76 ± 3.72			
BMI (kg/m2)						
Min. – Max.	18.93 – 34.36		18.68 – 34.90		2.038*	0.043*
Mean ± SD.	26.96 ± 4.38		28.35 ± 3.94			
Period of infertility						
Min. – Max.	3.0 - 10.0		5.0 – 12.0		0.533	0.595
Mean ± SD.	6.56 ± 2.18		6.39 ± 1.79			
Causes of infertility	No.	%	No.	%		
Male factor	15	27.3	19	25.3	c^2 = 7.303	0.063
Female factor	25	45.5	22	29.3		
Mixed	27	12.7	24	32.0		
Unknown	8	14.5	10	13.3		

IQR: **Inter quartile range** SD: **Standard deviation**
t: Student t-test χ^2: **Chi square test**
p: p value for comparing between the studied groups
*: Statistically significant at p ≤ 0.05

Table 2: Comparison between the two studied groups according to ICSI criteria

ICSI criteria	Group 1 (n=75)		Group 2 (n=75)		Test of sig	p
	No.	%	No.	%		
Pregnancy rate	40	53.3	37	49.3	c^2 = 0.240	0.624
Oocyte retrieved						
Min. – Max.	7.0 – 13.0		5.0 – 13.0		t = 0.150	0.881
Mean ± SD.	9.83±2.0		9.77±2.35			
M II oocyte						
Min. – Max.	2.0 – 8.0		3.0 – 9.0		t = 0.547	0.585
Mean ± SD.	4.95 ± 1.97		4.79 ± 1.59			
Maturation rate						
Min. – Max.	0.17 – 0.89		0.23 – 0.90		t = 0.218	0.828
Mean ± SD.	0.52 ± 0.23		0.51 ± 0.19			
Fertilization Rate						
Min. – Max.	46.49- 76.37		45.75 - 78.65		t =0.182	0.856
Mean ± SD.	62.01 ± 8.87		62.29± 10.44			
Endometrial thickness (ET)						
Min. – Max.	9.0 – 12.0		7.0 – 11.0		t =1.706	0.090
Mean ± SD.	10.21 ± 0.86		9.92 ± 1.22			

IQR: **Inter quartile range** SD: **Standard deviation**
χ^2: **Chi square test** **t: Student t-test**
p: p value for comparing between the studied groups

CONCLUSION

From the current study we can conclude that elevated serum progesterone level at time of HCG trigger has no effect on:

- Clinical pregnancy rate.
- Number of oocytes retrieved.
- Number of mature oocytes.
- Endometrial thickness.
- Maturation rate.
- fertilization rate.

As regard stimulation protocol:

A negative effect is reported on pregnancy rate in antagonist group rather than agonist with progesterone elevation at time of HCG trigger.