GROWTH DIFFERENTIATION FACTOR-8 EFFECT ON PROGESTERONE LEVELS DURING CONTROLLED OVARIAN STIMULATION IN INTRACYTOPLASMIC SPERM INJECTION

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INTRODUCTION

Intracytoplasmic sperm injection includes ovarian stimulation to retrieve mature oocytes, fertilize them by sperms and then embryo transfer after endometrial preparation.GDF-8 is a growth factor belonging to the transforming growth factor- β (TGF-β) superfamily that found to be highly expressed in the female reproductive system in addition to its first discovered site of release from myocytes and showed to have a dynamic trend, regulatory role and negative correlation with progesterone serum levels during controlled ovarian stimulation (COS).

AIM OF THE WORK

The aim of this study was to investigate the role of GDF-8 in regulating progesterone levels during controlled ovarian stimulation in patients undergoing IVF-ICSI- ET and evaluate its effect on pregnancy rate.

PATIENTS AND METHODS

42 women undergoing intracytoplasmic sperm injection are enrolled in a prospective cohort study. Patients are selected with the fulfillment of the inclusion criteria.
GDF-8 and progesterone (P4) serum levels both were measured in this study at 3 different time points during COS, human chorionic gonadotropin (hCG) administration day, oocyte pick up (OPU) day and 14 days after embryo transfer.

RESULTS

Table 1: Comparison between GDF-8 cut-off level of <3.9 and ≥3.9 (ng/ml) in relation to P4 serum level at the time of trigger administration "hCG day" and pregnancy outcome.

Pregnancy Outcome	Serum GDF-8 level (ng/ml)at time of trigger "hCG day"				Test value	p-value	Sig.
	<3.9(ng/ml)		≥3.9(ng/ml)				
	No.	%	No.	%			
Pregnant	2	25%	32	94.11%	8.682	0.001	HS
Non-Pregnant	6	75%	2	5.88%			
Total	8	100.0%	34	100.0%			

Using: Chi-square test
NS: Non significant; S: Significant; HS: Highly significant

Table 2: Comparison between GDF-8 serum decrease with cut-off level of <1.35 and ≥1.35 (ng/ml) and P4 increase level (from the day of hCG administration to the day of OPU) and pregnancy outcome.

Pregnancy Outcome	GDF-8 decrease level in serum (from the day of hCG to the day of OPU)				Test value	p-value	Sig.
	<1.35(ng/ml)		≥1.35(ng/ml)				
	No.	%	No.	%			
Pregnant	3	33.33%	31	93.9%	7.382	0.001	HS
Non-Pregnant	6	66.66%	2	6.1%			
Total	9	100.0%	33	100.0%			

Using: Chi-square test
NS: Non significant; S: Significant; HS: Highly significant

Table 3: Sensitivity and specificity for prediction of pregnancy using GDF-8 and P4 serum level (ng/ml).

Groups	Cut-off	Sen.	Spe.	PPV	NPV	Accuracy %
Serum GDF-8 level (ng/ml)						
Serum GDF-8 level (ng/ml) at time of trigger "hCG day"	≥3.9	94.3%	71.4%	94.3%	71.4%	90.5%
Serum GDF-8 decrease level (from hCG day to OPU day)	≥1.35	93.9%	55.6%	88.6%	71.4%	85.7%
Serum P4 (ng/ml)						
Serum P4 level At time of trigger "hCG day"	<1.5	88.8%	67.2%	88.8%	67.2%	87.2%
Serum P4 Increase (from hCG day to OPU day)	>16.03	91.5%	69.3%	91.5%	69.3%	87.8%

Sens.: Sensitivity; Spec.: Specificity; PPV: Positive predictive value; NPV: Negative predictive value

CONCLUSIONS

On the basis of the findings of the present study, we may infer that during controlled ovarian stimulation, serum GDF-8 levels exhibit a dynamic pattern in conjugation with serum progesterone.
Pregnancy after IVF-ET may be accurately predicted by a high serum level of GDF-8 on the day of trigger administration together with a decline in this level from the day of trigger to the day of oocyte pick up.