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Predictive factors for biochemical pregnancy in intracytoplasmic sperm injection cycles

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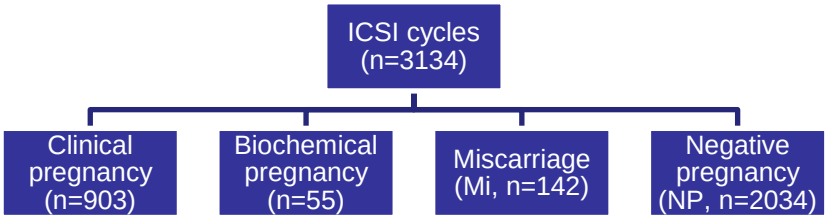
WHAT IS KNOWN ALREADY

It is estimated that 70% of all pregnancies are lost prior to live birth; among these, 25% to 50% end up as biochemical pregnancies (BP). In patients undergoing assisted reproduction technology (ART) treatments, in which β-hCG levels after embryo transfer are actively monitored, BP is diagnosed in up to 20% of the cycles. Despite the high incidence of BP, its predictive factors and precise etiologies remain unknown. The objective of this study was to investigate which factors contribute to the incidence of BP in intracytoplasmic sperm injection (ICSI) cycles.

MATERIALS AND METHODS



1st: The effects of seminal parameters, ovarian stimulation response and laboratory data on pregnancy outcomes were evaluated.

2nd: A discriminant analysis was conducted by the stepwise method for ICSI cycle prediction of BP or CP outcomes, to establish cut-offs for BP.

RESULTS

Table 1. Significant differences observed in descriptive analysis of seminal parameters and response to COS amongst the four groups

	CP (n = 903)	BP (n = 55)	Mi (n = 142)	NP (n = 2034)	p
TSC (x 10^6)	123.91 ± 7.18 [b]	62.95 ± 14.17 [a]	106.41 ±15.03 [b]	119.26 ± 4.54 [b]	0.035
TSM (%)	56.55 ± 0.87 [b]	44.02 ± 3.39 [a]	57.66 ± 2.09 [b]	57.57 ± 0.56 [b]	0.001
PM (%)	42.47 ± 0.84 [b]	33.78 ± 3.26 [a]	42.59 ± 2.01 [b]	43.58 ± 0.54 [b]	0.023
TMSC	74.16 ± 4.29 [b]	31.17 ± 15.58 [a]	71.78 ± 9.89 [b]	77.97 ± 2.72 [b]	0.029
ET (mm)	11.06 ± 0.76 [b]	9.74 ± 0.34 [a]	10.97 ± 0.22 [b]	10.75 ± 0.06 [b]	<0.001

Note: a ≠ b (General Linear Model Bonferroni post hoc $p < 0.05$). TSC – total sperm count; TSM – total sperm motility, PM – progressive motility; TMSC: total motile sperm count.

In the second analysis, the cut-offs for BP prediction established by the discriminant analysis were endometrial thickness < 11 mm, total sperm motility < 55.5% and total dose of FSH > 2,400 IU.

	Selected (n = 221)	Remaining (n = 2,030)	p
Total FSH dose (IU)	2,979.14 ± 56.33	2,382.80 ± 18.60	<0.001
Endometrial thickness (mm)	9.38 ± 0.16	11.08 ± 0.05	<0.001
Positive β-hCG (%)			<0.001
CP	74.3	81.9	
BP	15.7	3.9	
MI	10	14.2	

Table 2. Significant differences observed Descriptive analysis of COS and ICSI outcomes defined by BP cut-offs

CONCLUSION

BP can be predicted by utilizing combined cut-offs of endometrial thickness, sperm motility and total dose of FSH. This approach can improve the understanding concerning mechanisms responsible for BP and assist in the management of cases of previous pregnancy losses.