THE EFFECT OF MICRONUTRIENT SUPPLEMENTS ON ICSI OUTCOME IN POLYCYSTIC OVARIAN SYNDROME PATIENTS

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INTRODUCTION

Polycystic ovarian syndrome (PCOS) is the most common endocrine disorder in women of reproductive age, affecting 8–13%, and is a major cause of infertility due to ovulatory dysfunction. It is diagnosed based on the presence of at least two features: hyperandrogenism, ovulatory dysfunction, or polycystic ovarian morphology. Insulin resistance, present in 35–80% of cases, and obesity, especially abdominal obesity, further worsen reproductive outcomes. Although women with PCOS often produce more oocytes during IVF, these are frequently of poor quality, leading to lower fertilization and implantation rates. Micronutrient supplementation has been shown to improve insulin sensitivity, hormonal profiles, and oxidative stress in PCOS patients. Nutrients such as selenium, chromium, folate, zinc, calcium, vitamin D, L-carnitine, and omega-3 fatty acids may enhance oocyte quality and fertility outcomes. This study aimed to assess the effect of micronutrient supplementation on intracytoplasmic sperm injection (ICSI) outcomes in infertile women with PCOS, exploring its potential as an adjuvant therapy.

AIM OF THE WORK

The aim of the study was to investigate the effect of micronutrient supplements on intracytoplasmic sperm injection outcomes in polycystic ovarian syndrome patients.

SUBJECTS AND METHODS

This retrospective cohort study was conducted at Repro Fertility Center, Alexandria, Egypt, involving women aged 20–35 with PCOS (per Rotterdam criteria) who underwent ICSI using a GnRH antagonist protocol between December 2021 and December 2023. Patients with male factor infertility, uterine malformations, endometriosis, or intrauterine lesions were excluded.

All eligible PCOS patients during the study period were included and divided into two cohorts: one received micronutrient supplementation (Carnivita Advance sachets for women) for one month prior to ICSI, and the other did not. Baseline data, hormonal profiles, and ovarian morphology were recorded. Controlled ovarian stimulation was performed using recombinant FSH and cetrorelix. Oocyte retrieval occurred 35 hours after triggering, followed by ICSI. Outcomes included number and maturity of oocytes, fertilization rate, embryo quality, and pregnancy rates. Biochemical and clinical pregnancies were assessed post-embryo transfer. The study aimed to evaluate whether micronutrient supplementation improves ICSI outcomes in PCOS patients.

RESULTS

Table 1: Comparing the laboratory data between two studied groups.

	Group		
	Cases with micronutrients	Control	P value
Number of oocytes (Mean ±SD)	20.59 ± 9.44	21.83 ± 6.64	.399
M2 (Mean ±SD)	15.16 ± 7.43	12.45 ± 3.38	0.010*
Degradation (Mean ±SD)	2.07 ± 2.96	2.01 ± 1.68	.072
Class A (Mean ±SD)	7 ± 5	7 ±4	.488
Maturation rate (Mean ±SD)	78.13 ± 14.89	59.21 ± 13.76	0.001*
Fertilization rate (Mean ±SD)	85.18 ± 11.06	78.40 ± 14.38	0.001*

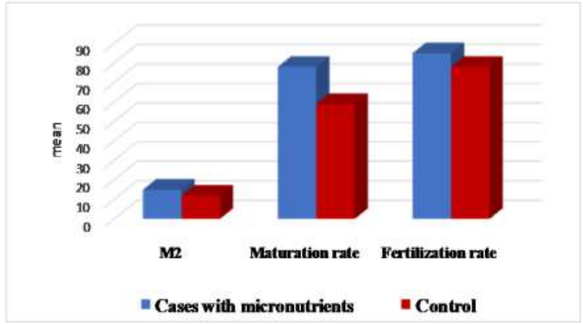

Figure 1: Comparing the two studied groups regarding Fertilization rate, Maturation rate and M2

Table 2: Comparing the two studied groups regarding chemical pregnancy rate, clinical pregnancy rate, and multiple pregnancy rate

		Group		
		Cases with micronutrients	Control	P value
Clinical Pregnancy rate	+ve	44 (65%)	58 (47.2%)	0.020*
	-ve	23 (35%)	65 (52.8%)	
Chemical Pregnancy rate	+ve	50 (73.5%)	68 (55.3%)	0.013*
	-ve	17 (26.5%)	55 (44.7%)	
Multiple pregnancy rate (%)	Twins	11 (16.4%)	27 (21.9%)	.064
	Triplet	3 (4.4%)	2 (1.6%)	
		14 / 67(20.8%)	29 / 123 (23.5%)	

*Statistically significant By Pearson Chi-square test

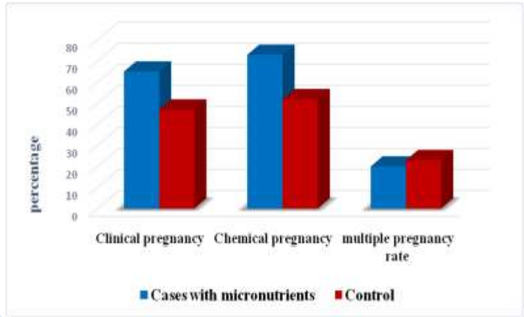

Figure 2: Comparing the two studied groups regarding chemical pregnancy rate, clinical pregnancy rate and Multiple pregnancy rate.

CONCLUSION

We concluded that micronutrients may offer a potential therapeutic benefit in IVF, particularly in enhancing oocyte quality and pregnancy outcomes.