Effect of 3-Month Micronutrient Supplementation on Sperm Quality and Pregnancy Outcomes in Males with Idiopathic Infertility

PM Liew[1], YT Tan[1], ZH Tay[1], CS Heong[2], ST Tee[2]

TMC Fertility Centre, Johor Bahru, Malaysia[1] and TMC Fertility Centre, Kota Damansara, Malaysia[2]

INTRODUCTION

The trend of male infertility has evolved rapidly and to date there is limited evidence about the effectiveness of micronutrient treatment on sperm quality (1,2). Male factors have contributed to almost half cases of infertility among couples, and in many patients the underlying cause is still unknown. This study was carried out to examine the efficacy of Profortil® consumption on improving sperm parameters and pregnancy outcomes among infertile males.

METHODS

This non-randomized cohort study was included male subjects (27-63 years) with at least a year of subfertility and one pathological semen analysis according to WHO 2010 lower reference limits and Kruger's strict criteria 2010. A total of 50 sub/infertile males were required to consume two daily capsules of the Profortil® for a 3-month period between the first and the follow-up semen analysis. 22 of men receiving no treatment served as controls. Semen analysis and an observation of pregnancy outcome were evaluated after 3 months of treatment. All data are presented as means ± standard deviations. Intragroup comparisons were identified using Paired Student's *T* test, whereas the Mann Whitney *U* test was used for intergroup comparisons. The pregnancy outcome between two groups were assessed using Pearson's chi-square. A p value <0.05 was considered as statistically significant(3).

RESULTS

Despite the consumption of Profortil®, both groups showed a significant increase in sperm density and total motility ($p<0.05$), but no any changes in sperm morphology after 3 months (Table 2). Although the increment differences of three parameters between two groups were not statistically significant, a higher number of participants who consumed Profortil® achieved a sperm count above 15 million/mL (30% vs 23%) and sperm motility more than 40% (18% vs 13.6%) (Table 3). 12 pregnancies, 2 miscarriages were reported in the treatment group (24%) whereas 1 miscarriage in the control group (4.5%) ($p<0.05$) (Table 4).

Table 1: Characteristics of patients (n=72).

Characteristics	Treatment	Control
Age	38.46±6.95	38.27±7.78
Ethnicity, n (%)		
Chinese	37 (74.0)	8 (36.4)
Malay	2 (4.0)	6 (27.3)
Indian	5 (10.0)	6 (27.3)
Other	6 (12.0)	2 (9.1)

Table 2: The changes in semen parameters before and after 3 months.

	Sperm density (million/ml)			Total Motility (%)			Normal morphology (%)		
	Treatment	Control	p-value[b]	Treatment	Control	p-value[b]	Treatment	Control	p-value[b]
WHO lower reference limits	15			40			5 (Kruger's strict criteria 2010)		
Pre-treatment	4.76 ±3.19	6.08 ±4.57	0.343	25.14 ±17.12	21.09 ±15.99	0.350	1.52 ±0.68	2.00 ±1.31	0.143
Post-treatment	13.00 ±11.65	9.90 ±7.38	0.452	32.30 ±16.74	30.77 ±21.61	0.509	1.62 ±0.83	2.09 ±1.34	0.156
p-value[a]	<0.0001	0.014	-	0.002	0.0002	-	0.058	0.162	-
Mean percentage of change from baseline	+172.88%	+62.78%	-	+7.16%	+9.68%	-	+0.10%	+0.09%	-

Note: Lower reference limit values for each parameter are provided in accordance to the WHO 2010 (4) and Kruger's strict criteria 2010.
[a] p value <0.05 when comparing post-treatment with pre-treatment using paired Student's *T* test.
[b] p values when treatments are compared with control using Mann Whitney *U* test.

Table 3: The changes in proportions of patients achieving sperm density and motility higher than WHO lower reference limits after 3-month period.

	Sperm density (≥15million/ml), n (%)		Total Motility ≥40%, n (%)	
	Treatment	Control	Treatment	Control
Pre-treatment	0 (0)	0 (0)	7 (14)	3 (13.6)
Post-treatment	15 (30)	5 (23)	9 (18)	3 (13.6)
Percentage of increment	30.00%	23.00%	4.00%	0.00%

Table 4: The pregnancy outcome of treatment group as compared with control.

Pregnancy outcome, n (%)	Treatment	Control	p value[c]
Pregnant	12 (24)	1 (4.5)	0.0481

[c] p value <0.05 when pregnancy outcome of treatment group is compared with control using Pearson's chi square test.

CONCLUSION

The finding suggests that Profortil® could be helpful in improving sperm parameters and pregnancy outcomes. Nevertheless, more research is likely to be needed in long term supplementation duration for better efficacy.

REFERENCES

1. Imhof, M., Lackner, J., Lipovac, M., Chedraui, P., & Riedl, C. (2012). Improvement of sperm quality after micronutrient supplementation. *e-SPEN Journal*, *7*(1), e50-e53.
2. Sun, C. G., Da, A. L., Sen, O. B., Yusof, Z., Chan, H. K., Balanathan, K., & Zain, M. M. (2017). Effects of 6-Week Micronutrient Supplementation on Sperm Parameters and Pregnancy Outcomes in Males with Idiopathic Infertility Undergoing Fertility Interventions: A Pilot Cohort Study. *Journal of Pharmacy Practice and Community Medicine*, *3*(4).
3. Lipovac, M., Bodner, F., Imhof, M., & Chedraui, P. (2016). Comparison of the effect of a combination of eight micronutrients versus a standard mono preparation on sperm parameters. *Reproductive Biology and Endocrinology*, *14*(1), 84.
4. World Health Organization. (2010). WHO laboratory manual for the examination and processing of human semen, Fifth edition.

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Contact

TMC Fertility Centre, Johor Bahru, Malaysia
Website: www.tmcfertility.com