

MiOXSYS[®] MALE INFERTILITY OXIDATIVE SYSTEM

Complete, accurate and rapid
oxidative stress diagnostic



Male oxidative stress infertility (MOSI): proposed terminology and clinical practice guidelines for management of idiopathic male infertility

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Review Article

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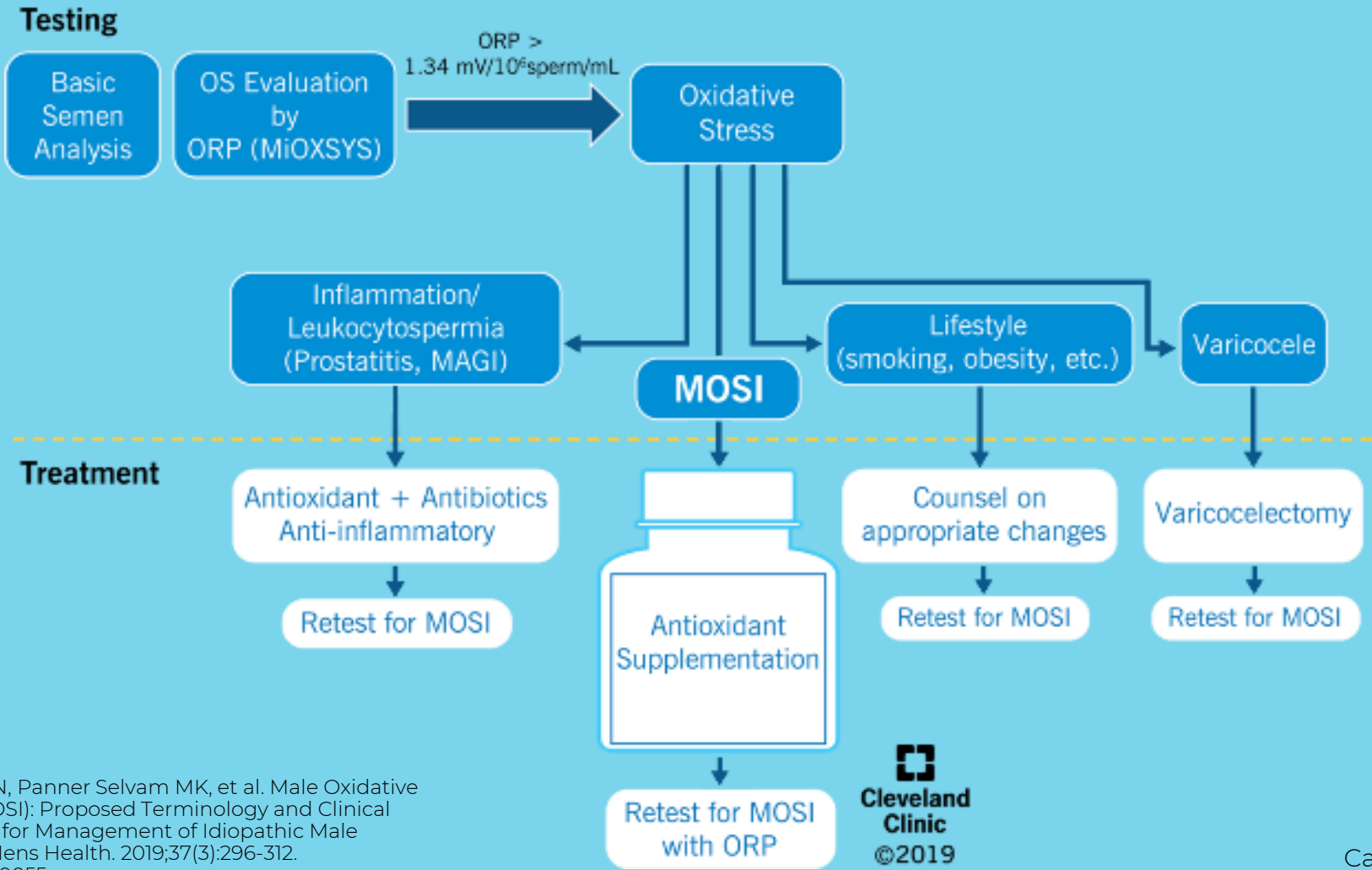
Male Oxidative Stress Infertility (MOSI): Proposed Terminology and Clinical Practice Guidelines for Management of Idiopathic Male Infertility

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MiOXSYS® is the cornerstone of Male Oxidative Stress Infertility (MOSI) diagnostics and management



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MOSI Clinical guidance

1

MOSI should be suspected in infertile men with abnormal semen characteristics and OS

2

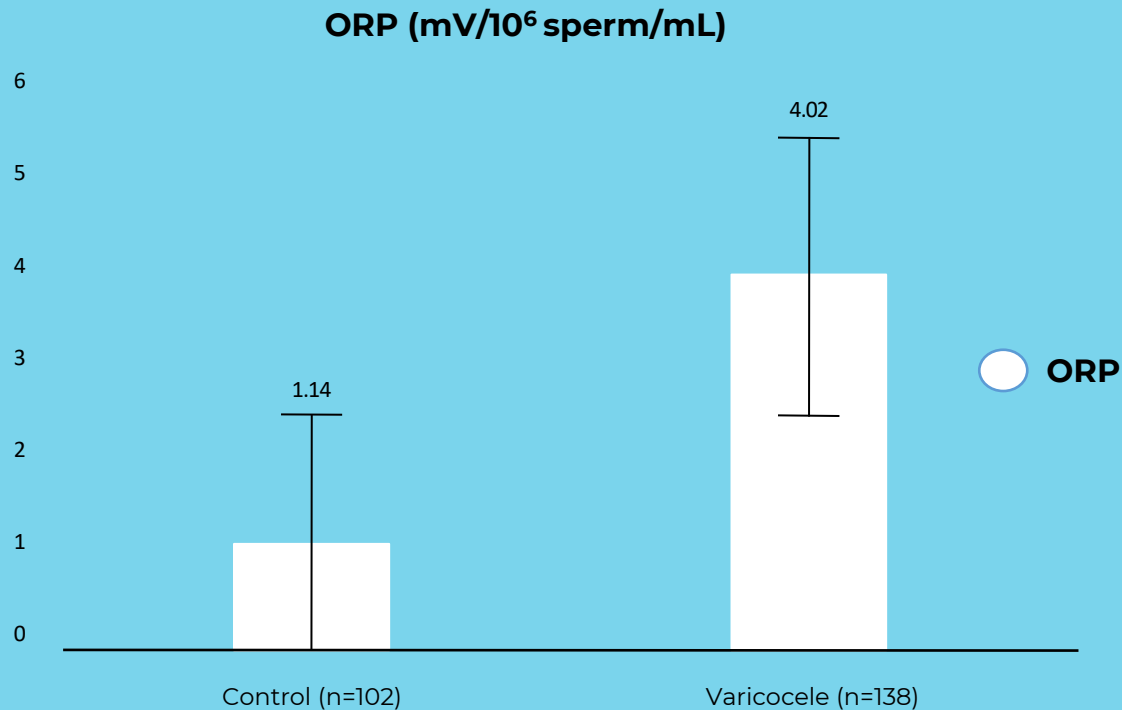
Many of these men were previously classified as idiopathic male infertility – with no underlying endocrine, genetic or anatomical causes of infertility

3

These men should be offered testing for OS (or ORP by MiOXSYS) to potentially diagnose MOSI



The mean ORP of the infertile men with a varicocele might be ~3.5x higher than that of the normozoospermic controls



138 infertile men with varicocele (Grade 1, 24 cases; Grade 2, 47 cases; Grade 3, 67 cases) and 102 men with normozoospermia without varicocele were evaluated.

The mean ORP of the infertile men with a varicocele was three times higher than that of the normozoospermia controls ($p < 0.01$).

Varicocele repair improves ORP

SEMEN PARAMETERS	MEANS		P VALUE	95% CI
	PRE-VARICOCELE	POST-VARICOCELE		
sORP (mV/10 ⁶ sperm/mL)	4.73	2.03	0.001	-1.38 - -2.68
Progressive Motility (%)	19.98	27.98	0.001	24.69-30.20
Total Motility (%)	45.88	54.85	0.01	49.60-59.09
Morphology (%)	3.82	4.27	NS	3.44-5.21
Sperm Concentration (10 ⁶)	28.11	37.85	.05	2.77-15.78
Total Sperm (10 ⁶)	85.21	111.96	NS	2.66-48.08

Post varicocele repair compared to pre varicocele repair revealed significant improvement in ORP (P<0.001), SDF (P<0.001) total motility (P<0.01), and progressive motility (P<.0.001). Although there was an improvement in morphology, it was not statistically significant.

This study validates previous data that varicocele repair improves bulk semen parameter values and SDF, but is the first to demonstrate it improves ORP.

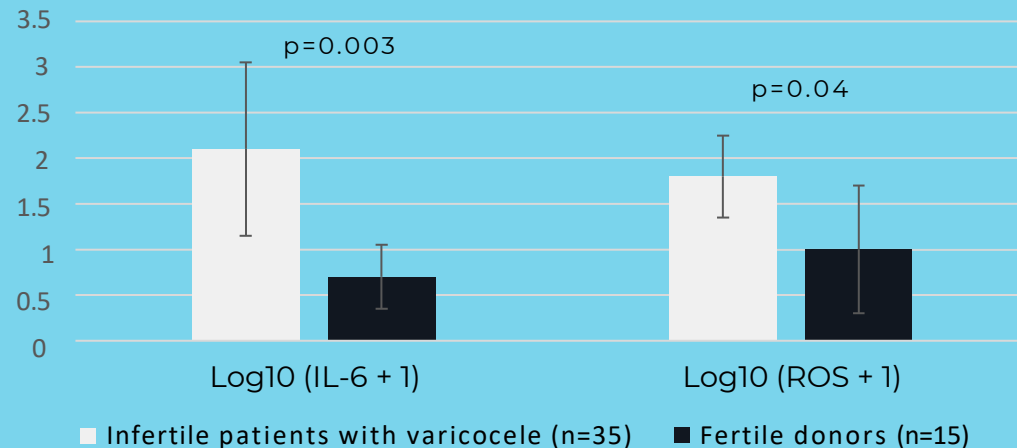


Inflammation matters: IL-6 correlates with ROS and ORP levels

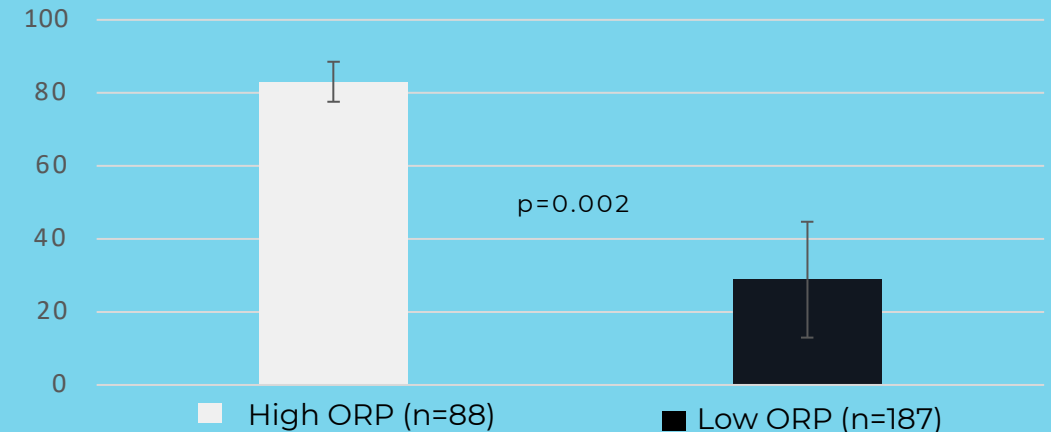
The IL-6 levels correlated significantly with the ROS levels in the infertile patients with varicocele ($r = 0.39$; $p = 0.01$).

Inflammatory marker IL-6 concentration was significantly higher in patients with high ORP ($p=0.002$).

IL-6 and ROS level differences in infertile varicocele patients and fertile donors



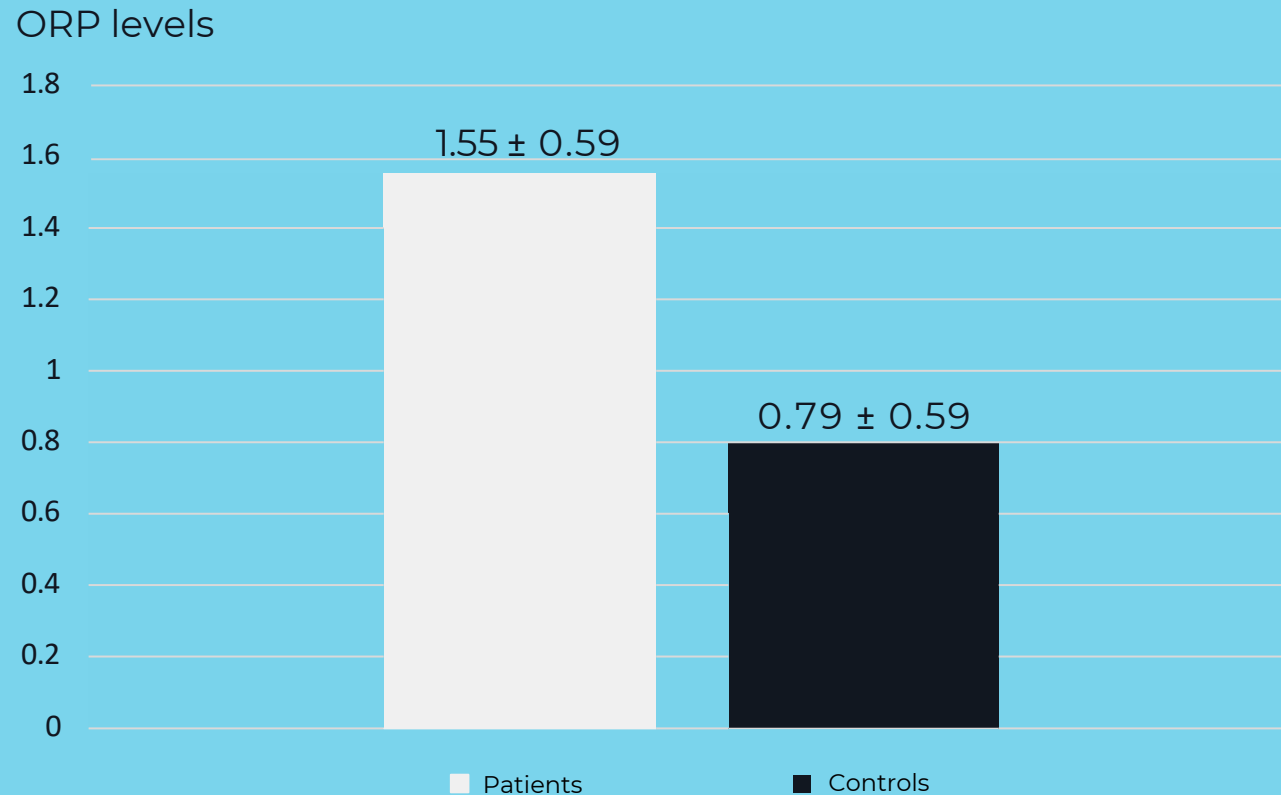
IL-6 concentrations (\pm SE)



Pomm K. et al. Data on file.



Chronic inflammation increases ORP levels and impairs male fertility



Males diagnosed with inflammatory bowel diseases have worse basic sperm parameters compared to those who are healthy.

Regarding the sperm of males ill with Inflammatory bowel diseases, the phenomenon of oxidative stress is intensified, which may be the cause of the deterioration of semen parameters, as well as an intensified DNA fragmentation.

An asymptomatic carrier state of bacteria may contribute to the intensification of oxidative stress.



ORP increases with paternal age

Study Objective:

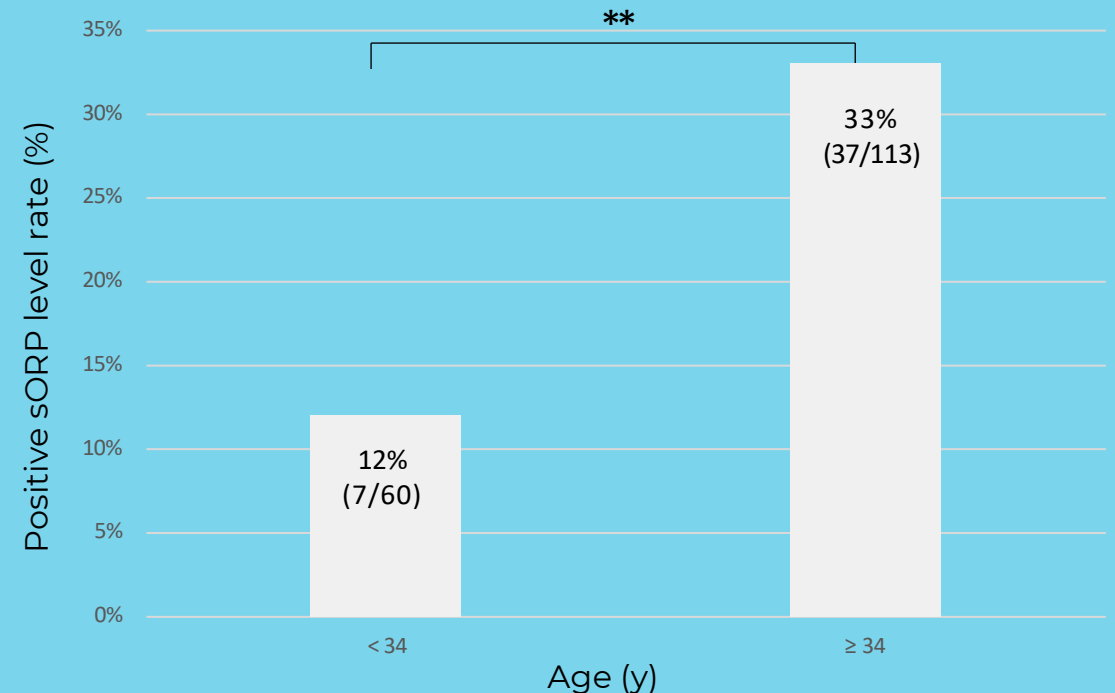
- To investigate the relationship between the ORP and paternal age with the goal of using the ORP as an indicator of semen oxidative stress.

Study Location:

- Yokohama University Medical Center, Japan

Results:

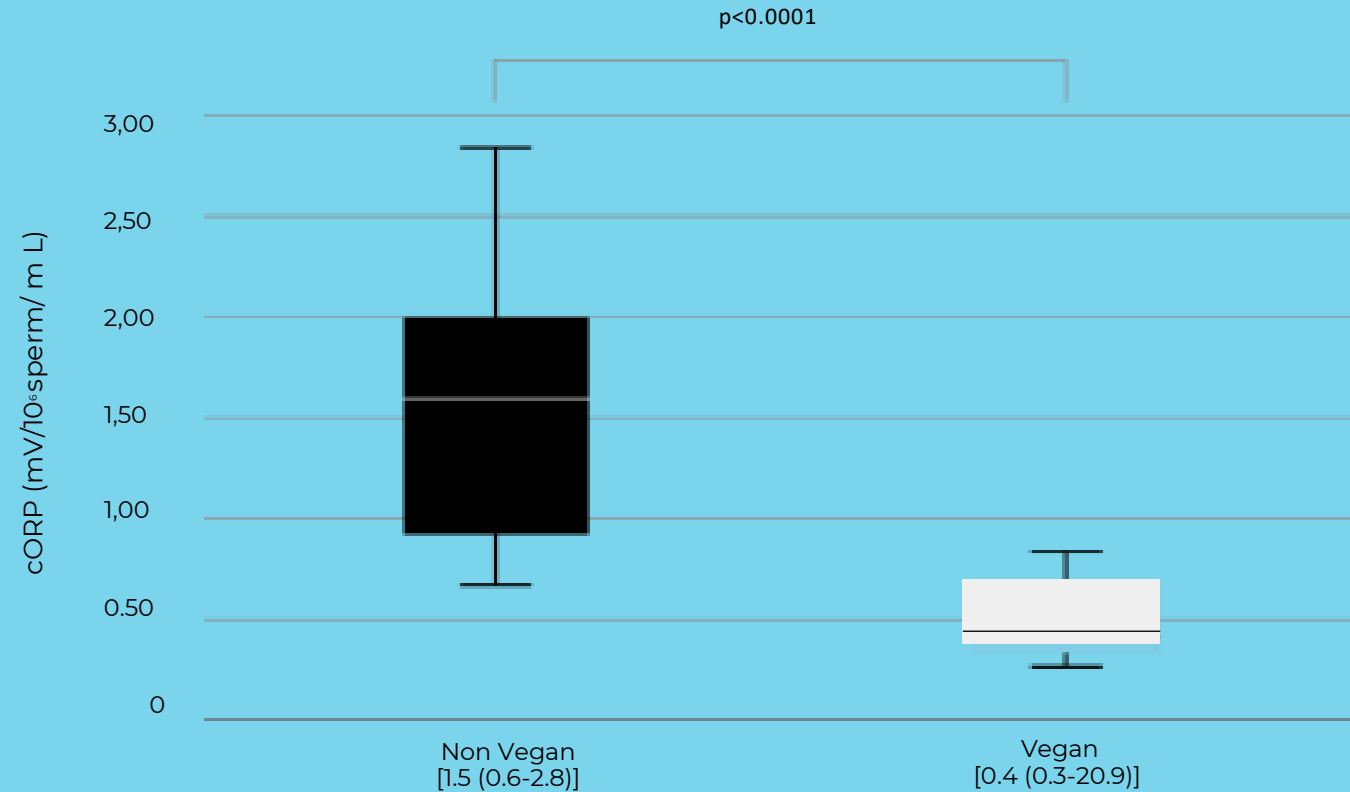
- The semen ORP level was positively correlated with age ($p < 0.05$). The rate of ORP positivity was significantly increased in men ≥ 34 years of age compared with that in men < 34 years of age (33% compared with 12%, respectively; $p < 0.01$).



Comparisons of the rate of static oxidation reduction potential (sORP) positivity between men aged < 34 and ≥ 34 years. The vertical axis shows the rate of positive sORP, with the horizontal axis showing age. sORP ≥ 1.38 was defined as a positive level. ** $p < 0.01$.



Healthy diet decreases seminal ORP



Patients who follow vegan diet demonstrate decreased ORP levels.



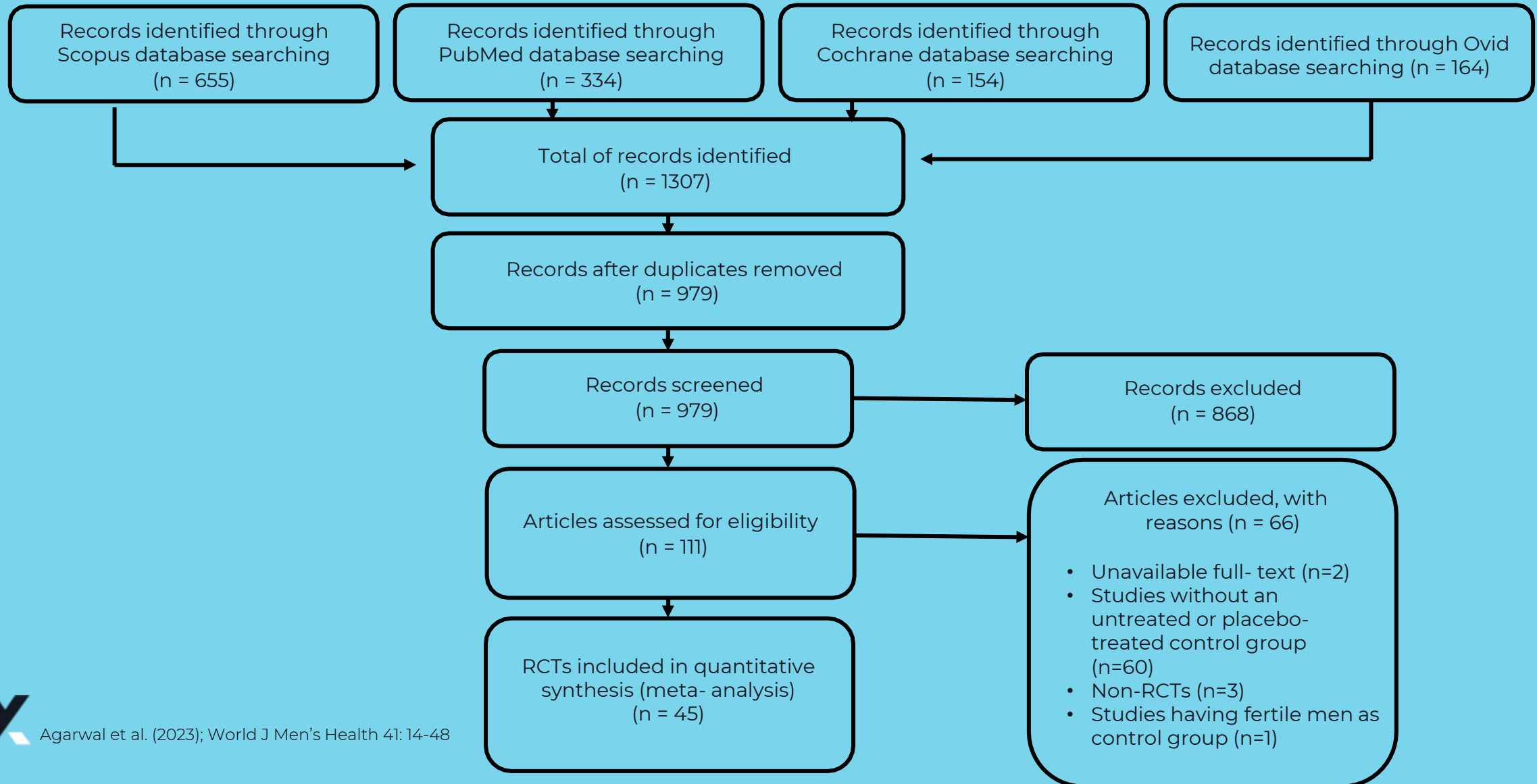
There is no evidence for the benefit of other medical therapies
(e.g. hCG, androgens) for treatment of male infertility

hence, the medical therapy is empirical

What about antioxidants?



Impact of antioxidant therapy on semen parameters and natural pregnancy outcomes: a meta-analysis



Clinical pregnancy

Therapy with Antioxidants improves clinical pregnancy rate compared to placebo/no treatment (OR 1.97, $I^2 = 20\%$; $p < 0.01$).

