Is Antioxidant Treatment Viable For Idiopathic Male Infertility?

Sulagna Dutta, PhD
Summer Intern 2019
American Center for Reproductive Medicine
Department of Urology, Cleveland Clinic
Cleveland, OH

Lecturer
Physiology, Faculty of Dentistry
MAHSA University
Selangor, Malaysia
Male Infertility: Underlying Causes

IDIOPATHIC MALE INFERTILITY
>25% of male infertility cases

CAUSES OF MALE INFERTILITY

- Congenital
- Genetic
- Leukocytospermia
- Ductal obstructions
- Endocrine dysregulations
- Mitochondrial dysfunctions
- Varicocele
- Immune
Oxidative stress (OS) is a common mediator for various etiologies to impair sperm functions.
Aim and Objectives

Aim

To evaluate the effect of antioxidant treatment in idiopathic male infertility.

Objectives

1. To identify research articles on antioxidant treatment in male infertility
2. To present a concise understanding of whether antioxidant treatment improve male fertility parameters
Methods

- Literature search following the PRISMA guidelines from electronic databases, PubMed and Scopus

- MeSH terms used:
  
  Male infertility, antioxidants, idiopathic, oxidative stress, semen parameters, sperm functions, sperm DNA fragmentation, Assisted Reproductive Techniques

- Systematically tabulate and review in a concise manner

**Inclusion Criteria**
- Studies concerning antioxidant and idiopathic male infertility or subfertility
- Clinical trials

**Exclusion Criteria**
- Female factor infertility
- Animal studies other than human
- Non-English articles
- Studies with treatment duration of less than 3 months
Total number of articles = 943

Articles excluded that do not include “idiopathic male infertility” = 838

Potential articles to evaluate for time of publication = 105

Articles excluded that are published before 2009 = 38

Potential articles for evaluation of abstract = 67

Articles excluded based on species (animals other than human) = 11

Potential articles for evaluation of full manuscripts = 56

Articles excluded after screening of manuscripts = 31

Potential articles including (review + original) = 25

Review articles = 13
Non-reproducible data = 2

Articles included in this study (Clinical human trials) = 10
Statistical Analysis

- Data were analyzed using MedCalc (v.19.0.5) statistical software package.
- Semen parameters were tested for normality of distribution of data.
- Wilcoxon test for non-parametric data sets.
- Student’s t-test for parametric data sets.
- Significant difference between the pre-treatment data set with post-treatment data set across the studies were considered if P<0.05.
Antioxidant Treatment and Sperm Concentration

*Significance level, P<0.05

- Safarinejad et al., 2012 (CoQ10)
- ElSheikh et al., 2015 (Vitamin E)
- Safarinejad, 2012 (Pentoxifyllin)
- Safarinejad et al., 2012 (Ubiquinol)
- Safarinejad, 2011 (Omega-3 fatty acids)
- Abad, Amengual et al., 2013 (Antioxidant combination)
- Busetto, Agarwal et al., 2018 (Antioxidant combination)
Antioxidant Treatment and Total Sperm Motility

*Significance level, $P<0.05$

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<th>Treatment</th>
<th>Pre-treatment</th>
<th>Post-treatment</th>
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Antioxidant Treatment and Sperm Morphology

*S*Significance level, *P*<0.05

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Significant increase (P<0.05) in the post-treatment data set compared to pre-treatment data set across all the studies on antioxidant treatment in idiopathic male infertility.

Comparative Analysis For Semen Parameters

Wilcoxon Test For Sperm Concentrations

- No. of studies = 7
- Sample size = 1134
- P = 0.0156

Student’s t-test For Total Sperm Motility

- No. of studies = 9
- Sample size = 1294
- P = 0.0037
Antioxidants

- Coenzyme Q₁₀
- Vitamin C
- *Withania somnifera*
- Omega-3 fatty acids
- Pentoxifylline
- Vitamin E
- Carnitines
- Antioxidant combinations

Scavenge free radicals

Reverse Oxidative Stress

Summary
I take this opportunity to express my gratefulness to all my mentors of ACRM, Cleveland Clinic, for preparing me and encouraging me all the way to this podium. I would also like to thank all my friends for their support and appreciation.
THANK YOU FOR YOUR ATTENTION