

Oxidation Reduction Potential is Correlated to Spermatogenic Testicular Function in Infertile Men

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Study question

Is oxidative stress a clinical indicator for testicular function in infertile men?

Summary answer

Oxidative stress measured by oxidation reduction potential (sORP) can be considered a clinical indicator of spermatogenic and not endocrine function of the testis.

What is known already

Oxidative stress plays a major role in the pathogenesis of male infertility. sORP is a recent marker of oxidative stress that has been proven to correlate significantly with different semen parameters in infertile men and can be used to differentiate normal fertile from infertile semen. Besides semen parameters, testicular size and FSH are considered as prognostic markers for spermatogenesis.

Study design, size, duration

Cross sectional, retrospective study on 660 patients attending a male infertility clinic during the period from January to March 2017.

Participants/materials, setting, methods

Medical records of recruited patients were reviewed. The data extracted included medical history, clinical examination, semen analysis (WHO 5th edition), sORP (using MiOXSYS system), hormonal assay including FSH, LH, prolactin, testosterone and estradiol as well as testicular size assessment by scrotal ultrasound. After checking for normal distribution of the data by means of the Chi-squared test, Spearman rank test was used to detect correlations between different parameters. Statistical significance was defined as $p < 0.05$.

Table (1): Correlation of different clinical parameters

		Age	Vol	Count	PR	NPR	Morph.	SDF	Tests size	FSH	LH	T	PRL	E2
sORP	<i>r</i>	0.097	0.104	-0.793	-0.431	-0.023	-0.458	0.264	-0.386	0.275	0.182	0.082	0.066	0.070
	<i>P Value</i>	0.012	0.007	<0.001	<0.001	0.5630	<0.001	<0.001	<0.001	<0.001	<0.001	0.094	0.179	0.168
	<i>No.</i>	659	652	659	658	658	659	659	199	417	415	413	416	387

Vol: volume – PR: progressive motility – NPR: nonprogressive motility – Morph.: morphology – SDF: sperm DNA fragmentation – FSH: follicular stimulating hormone – LH: lutenizing hormone – T: testosterone – PRL: prolactin – E2: estrogen – *r*: correlation coefficient – *No.*: number of cases

Main results and the role of chance

sORP correlated highly significantly negatively ($r = -0.793$, $P < 0.0001$) with the sperm count, motile sperm count ($r = -0.579$; $P < 0.0001$), progressive motility ($r = -0.431$; $P < 0.0001$) and normal sperm morphology ($r = -0.458$; $P < 0.0001$). sORP also correlated with sperm DNA fragmentation ($r = 0.264$, $P < 0.0001$). (Table 1)

sORP correlated significantly with the testicular size ($r = -0.386$; $P < 0.0001$), serum FSH ($r = 0.273$; $P < 0.0001$) and serum LH concentrations ($r = 0.182$; $P = 0.0002$), but not with testosterone, estradiol and prolactin. (Table 1)

Limitations, reasons for caution:

The main limitation is the lack of fertile controls in this study.

Wider implications of the findings:

ORP can be used as a marker of spermatogenesis in infertile men. Further studies should be carried out to demonstrate the effect

of treating OS on spermatogenesis. Since varicocele patients show seminal oxidative stress, smaller testes and higher FSH values, ORP could possibly be used as adjunct indicator of varicocele.

References

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