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# The Effect of Post Chlamydia Trachomatis Infection Treatment on Reactive Oxygen Species and Sperm Parameters of Infertile Men

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Chlamydia Trachomatis (CT) infection is often mentioned as a silent disease. Reactive Oxygen Species (ROS) can also cause Sperm apoptosis and have negative impact on Sperm parameters. The objectives of this study were to elucidate the association between Sperm parameters and ROS caused by CT infections resulting in male Infertility as well as evaluating the role of antibiotic therapy. A total of 848 infertile males having normal and abnormal Sperm parameters were included. After Semen sampling, the CT IgA were measured by Elisa and confrmed by Nested PCR. ROS was determined by Chemiluminescence. After treatment under the direct supervision of the private urologists. Then, the second Semen samples were taken and subjected to tests on Sperm parameters and ROS levels as assessed again. The levels of ROS and morphology were improved following the treatments (P<0.05). Antibiotic therapy due to CT infection, could reduce ROS, improve normal morphology and recover some of Semen parameters. Our fndings indicate that CT infection and Sperm parameters were associated with the rate of ROS in infertile men. However, after treatment, ROS value dropped allowing the recovery of certain Sperm parameters.

Antibiotic therapy can improve some Semen quality parameters and treat the male Infertility.

**Keywords:** Antibiotic treatment; Chlamydia trachomatis; Male under the tm 0 3(a); Rm(t; C)-5 c

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### Frequency of C. trachomatis between the study groups

Of 848 patients (with normal and abnormal Sperm) included in the study group (infertile men), seven (0.83%) were tested positive for *C.* . All infected patients in the study group were resolved from the infection a er the treatment completion.

### Semen parameters

Table 1 and 2 compares the Semen parameters before and a er the antibiotic therapy, respectively. Figure 1 shows the Semen parameters in infected infertile men before and a er the antibiotic therapy. ere was not statistically signi cant di erence in the Semen parameters.

e count of leukocytes, Sperm count, total motility, Class A (rapid progressive), class D (non-motile), volume of Semen and pH Semen a er treatment, the parameters of recovery showed improvement with no signi cant di erences (P>0.05.). Motility of the Class B (progressive) and class C (non-progressive) had no signi cant di erences. e mean count of white blood cells in the pre-treatment sample was 0.41 ± 0.518 million per ml, and the mean count of white blood cells in the samples a er treatment was 0.09 ± 0.146 million per ml, e count of WBC was decreased a er treatment compared with before treatment, but this reduction was not signi cant (P-value=0.144).

e Sperm count was increased numerically a er treatment, but this increase was not signi cantly di erent (P-value=0.128). e Sperm motility was increased numerically a er treatment compared with before treatment, but this increase was not signi cantly di erent (P-value=0.398). Sperm motility including class A, class B, class C and class D before and a er treatment was not signi cant (P-value=0.138).

e volume of Sperm samples was not statistically signi cant before and a er treatment (P-value=0.249). e pH Semen samples were not statistically signi cant before and a er treatment (P-value=0.157). e normal morphology a er treatment compared with the baseline was signi cantly was increased (P-value=0.024).

| | | |
|---|---|---|
| After ROS total/Before ROS total | 2.023a | 0.043* |
| After ROS WBC/Before ROS WBC | 2.023a | 0.043* |
| After ROS base/Before ROS base | 2.023a | 0.043* |
| After pH/Before pH | 1.414a | 0.157 ns |
| After normal morphology | 2.251b | 0.024* |
| After volume/Before volume | 1.153b | 0.249ns2.251b1.414a |

6221.276 cm0 0 m4 262.441GS0 gsq1 0 0 1 313.2283 742.1595 cm0 0091 0

| Mill/ml | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 | Sample 6 | Sample 7 |
|---|---|---|---|---|---|---|---|
| WBC before treatment | | | | | | | |
| | | | | | | | |
| | | | | | | | |

### Inclusion-exclusion criteria, semen collection and analysis

All the patients were clinically examined and asked for past medical, sexual, and social histories. e study population consisted of men who referred to Royan Institute with Chlamydia trachomatis infection. Eight hundred and forty-eight patients with normal and abnormal Sperm parameters (low Sperm count, pyoSpermia, low Sperm progressive motility, low normal morphology) were included.

Patients with symptoms such as genitourinary tract infections, reproductive system abnormalities, varicocele, testicular tumors, systemic diseases, non-compliance with Spermogram test conditions, and those with a history of antibiotic use in the previous week were not included in our study.

is study was a cross-sectional study, Semen samples were collected into sterile sample cups through self-administered masturbation, a er 3-7 days of sexual abstinence. Samples were put in the incubator directly for liquefaction and then manually analyzed by the same person for volume, viscosity, pH, presence of White Blood Cells (WBCs), Sperm concentration (count per ml and total count), motility (classes A, B, A+B, C, and total), and normal morphology, as indicated by the latest WHO manual for Semen analysis (Organization, 2010). Semen analysis was con rmed using a light microscope equipped with a Computer-Aided Semen Analysis (CASA; Test Sperm2.1, Video test, St. Petersburg, Russia) system. e presence of leukocytes in seminal uid was detected by peroxidase test. Sperm morphology was detected by staining papanicolaou procedure.

In the rst appointment, Semen samples from infertile men were collected in sterile containers and each sample was divided into two parts; the rst part for Semen analysis and the next part for Sperm parameters. To evaluate the rst part, Sperms were kept into sterile vials in order to perform the Elisa test and PCR at -70°C until testing was contained. A er the centrifugation, plasma samples were analyzed by Elisa test samples and sediment samples were used for DNA extraction. A er the infection con rmation by PCR, patients were asked to visit the second visit interval of 3 days from the last ejaculation for Sperm analysis and ROS tests. Antibiotics (every 12 h for two weeks) were also prescribed for them. A er the completion of antibiotic usage, if the patients were not resolved from the infection, the treatment continued taking the same antibiotic with the same dose for another week. In order to assess the e ect of the empirical antibiotic treatment on Semen parameters ROS levels, as well as clearance from infection, a subsequent Semen sample was taken 30 days a er completion of the antibiotic therapy, by considering the 3-7 days of sexual abstinence.

### Elisa test

To detect speci c IgA, antibodies to *C.*

this bacterium and its treatment. Our ndings will also be helpful for infected patients who have abnormal Semen parameters to maintain fertility and reproductive health.

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## Disclosure statement

e other authors have no competing interests to disclose.

## Ethics Approval

e ethical approval for patient enrolment in this study was obtained from the Ethics Committee of Royan institute (IR.ACECR. ROYAN.REC.1394.84).

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## Author contribution

Analyzed the data, evaluated the results, and wrote the paper: RA

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