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ABSTRACT

Introduction: Sperm DNA integrity is a useful biomarker for male infertility diagnosis and prediction of assisted reproduction outcomes. Sperm DNA damage has been associated with poor embryo quality and lower pregnancy rates, as well as, higher rates of spontaneous miscarriage. Sperm DNA damage is often the result of oxidative stress in the male reproductive tract (1, 2). As such, antioxidants are used to improve male fertility potentials (3). We evaluated the effect of a new oral antioxidant supplement (Fertil Pro) on sperm DNA fragmentation index in men with idiopathic infertility.

Methods: We studied a cohort of men presenting for infertility evaluation at the **ovo fertility** between May 2016 and March 2017. From this cohort, we identified a sub-cohort of 20 consecutive infertile men that had a baseline sperm DNA test and were treated with an oral antioxidant. After 2 to 3 months of antioxidant treatment, these men underwent a second sperm DNA test. Sperm DNA fragmentation analysis was measured by TUNEL assay (4) and the results were expressed as %DNA fragmentation index (%DFI).

Results: We observed that oral antioxidant therapy was associated with a significant decrease in sperm %DFI (from $38.3 \pm 2.7\%$ to $26.8 \pm 1.8\%$, respectively). Moreover, 95% of the men had a decrease in %DFI after treatment. However, mean sperm concentration and mean sperm progressive motility did not change significantly after oral antioxidant therapy (52 ± 1.8 to $54 \pm 1.8\%$ and from $48 \pm 1.4\%$ to $50 \pm 1.4\%$, respectively).

Conclusions: Our data suggest that a large percentage of infertile men may experience a reduction in sperm DNA fragmentation after oral antioxidant therapy. However, randomized controlled trials are needed to validate these findings.

OBJECTIVE

The aim of the study was to evaluate the influence of an antioxidant supplement on sperm DNA integrity in a cohort of men with idiopathic infertility.

METHODS

We studied a cohort of 366 men presenting for infertility evaluation and sperm DNA testing at the **ovo fertility** between May 2016 and March 2017. From this cohort of 366 men, we identified a sub-cohort of 20 consecutive infertile men that were treated with an oral antioxidant supplement (Fertil Pro: 400 mg L-Carnitine, 300 mg vitamin C, 100 mg coenzyme Q10, 67 mg vitamin E, 30 mg zinc, 3 mg beta-carotene, 2 mg lycopene, 1 mg folic acid, 50 µg vitamin B12, 30 µg selenium and 25 µg vitamin D). After 2-3 months of oral supplement intake, these men underwent a second sperm DNA test. The sperm DNA fragmentation analysis was measured by a flow cytometry-based terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) assay and the results were expressed as % DNA fragmentation index (%DFI).

STATISTICS

Results were expressed as mean \pm SEM. Each sperm %DFI was a mean of 2 sample runs. The comparison of the data obtained was performed using GraphPad Prism version 5.

RESULTS

Figure 1. The DNA fragmentation index (%DFI) before and after treatment in each one of the 20 men.

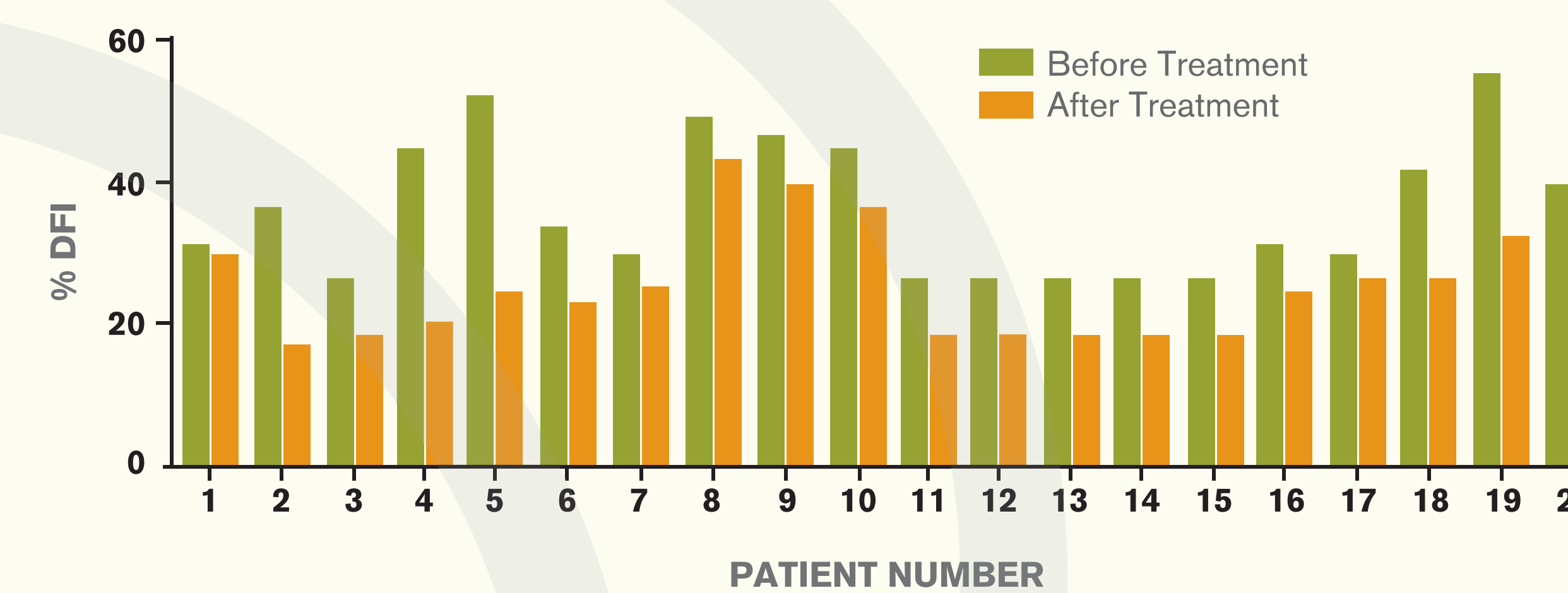
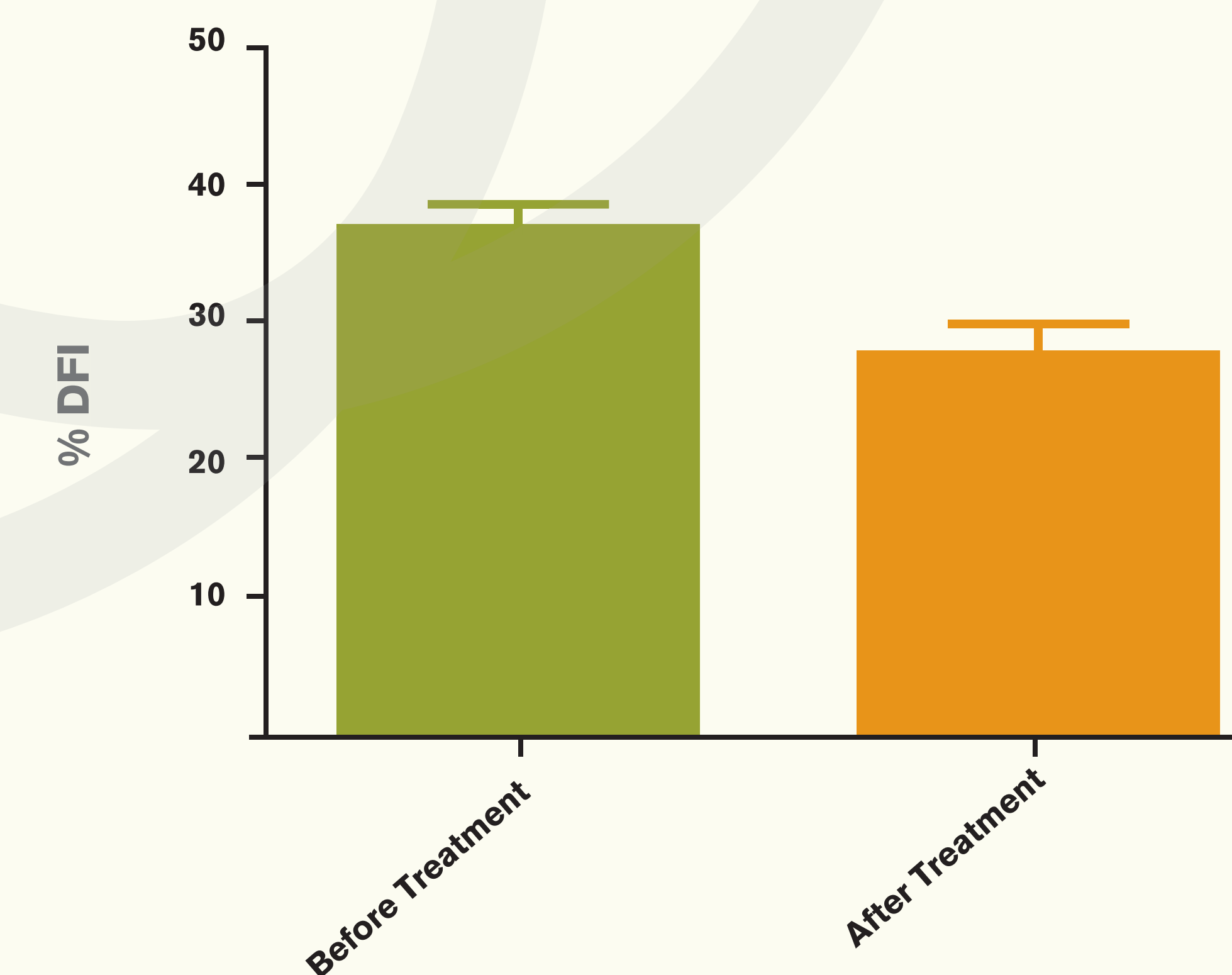


Figure 2. The mean % DFI (comparison before and after treatment).



We observed that %DFI decreased significantly after antioxidant therapy (from $38.3 \pm 2.7\%$ to $26.8 \pm 1.8\%$, respectively), with 95% of the patients experiencing a reduction in their %DFI. Furthermore, 52.9% of men with a high initial %DFI (%DFI 30%) had a DFI below 30% after treatment. The mean sperm concentration and mean sperm progressive motility did not change significantly after oral antioxidant therapy.

CONCLUSION

Our data suggest that infertile men may benefit from oral antioxidant therapy with a significant reduction in sperm %DFI. Moreover, a high percentage of infertile men with elevated sperm %DFI will have a normal sperm %DFI after treatment. However, there is a need for randomized controlled trials to confirm these promising observations.

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