



OVO

CLINIQUE

BENEFICIAL EFFECT OF AN ANTIOXIDANT THERAPY ON SPERM DNA INTEGRITY IS NOT ASSOCIATED WITH A SIMILAR EFFECT ON SPERM CHROMATIN INTEGRITY



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ABSTRACT

Objective: To evaluate the influence of an antioxidant supplement on sperm chromatin and DNA integrity in a cohort of men with idiopathic infertility.

Design: Retrospective cohort study

Materials and Methods: We evaluated infertile couples presenting at the **ovo fertility** between May 2016 and November 2017. We identified a cohort of 17 consecutive infertile men that were treated with an oral antioxidant supplement and had both sperm DNA and chromatin integrity testing before and 2 to 3 months after initiating treatment. Sperm DNA fragmentation 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). Sperm chromatin integrity testing was performed by aniline blue staining and the results expressed as % chromatin damage.

Results: We observed that oral antioxidant therapy was associated with a significant decrease in mean (\pm SD) %DFI (from $37.7 \pm 5.9\%$ to $26.6 \pm 9.2\%$, $P < 0.0001$), with most patients (94%) experiencing a diminution in their %DFI after therapy. However, antioxidant therapy was not associated with a significant change in chromatin damage (from $28.8 \pm 13.1\%$ to $30.1 \pm 11.8\%$, $P=0.48$).

Conclusions: Our data show that infertile men may experience a reduction in sperm DNA fragmentation after oral antioxidant therapy. A similar improvement in chromatin integrity was not observed and may be explained by the requirement for a mild oxidative stress in the induction of sperm chromatin compaction. These data demonstrate the complex nature of sperm chromatin and the variable influence of oxidative stress on different sperm chromatin targets.

OBJECTIVE

To evaluate the influence of an antioxidant supplement on sperm chromatin and DNA integrity in a cohort of men with idiopathic infertility.

METHODS

We evaluated infertile couples presenting at the **ovo fertility** between May 2016 and November 2017. We identified a cohort of 17 consecutive infertile men that were treated with an oral antioxidant supplement and had both sperm DNA and chromatin integrity testing before and 2 to 3 months after initiating treatment. Sperm DNA fragmentation 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). Sperm chromatin integrity testing was performed by aniline blue staining and the results expressed as % chromatin damage.

STATISTICS

Each sample was treated in duplicate. Wilcoxon signed rank test was performed for comparison of data and all statistical analyses were conducted using GraphPad Prism, version 5.

RESULTS

Figure 1. The DNA fragmentation percentage before and after treatment.

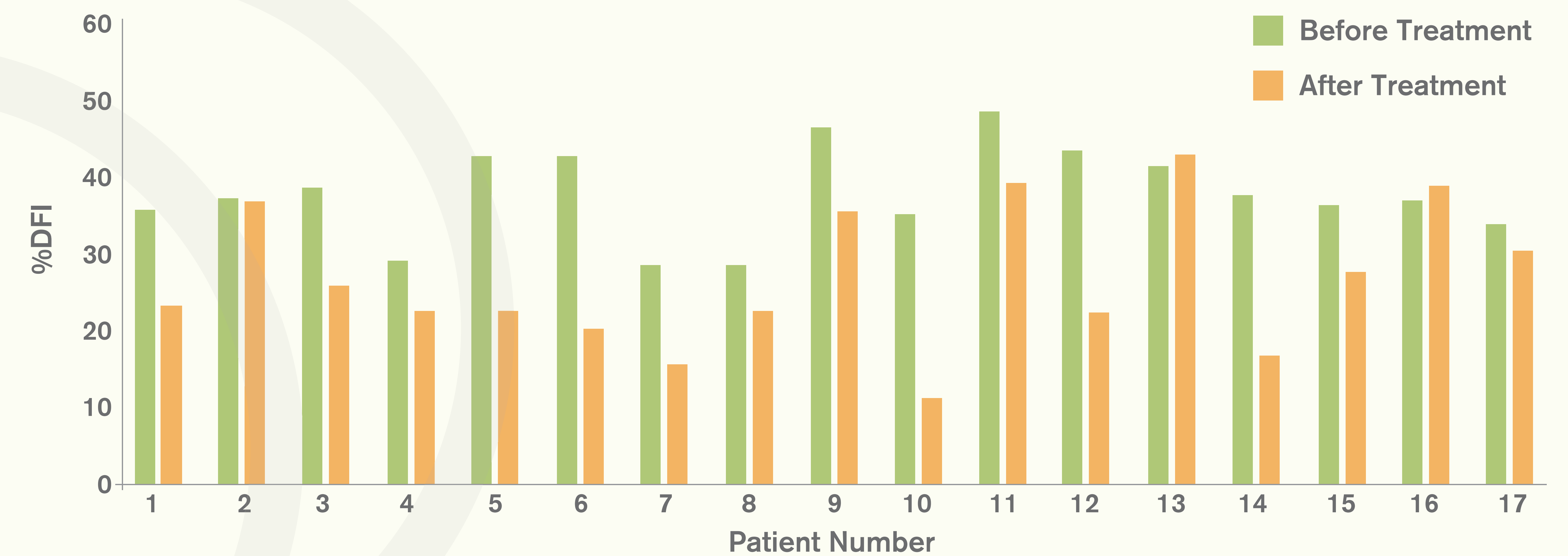
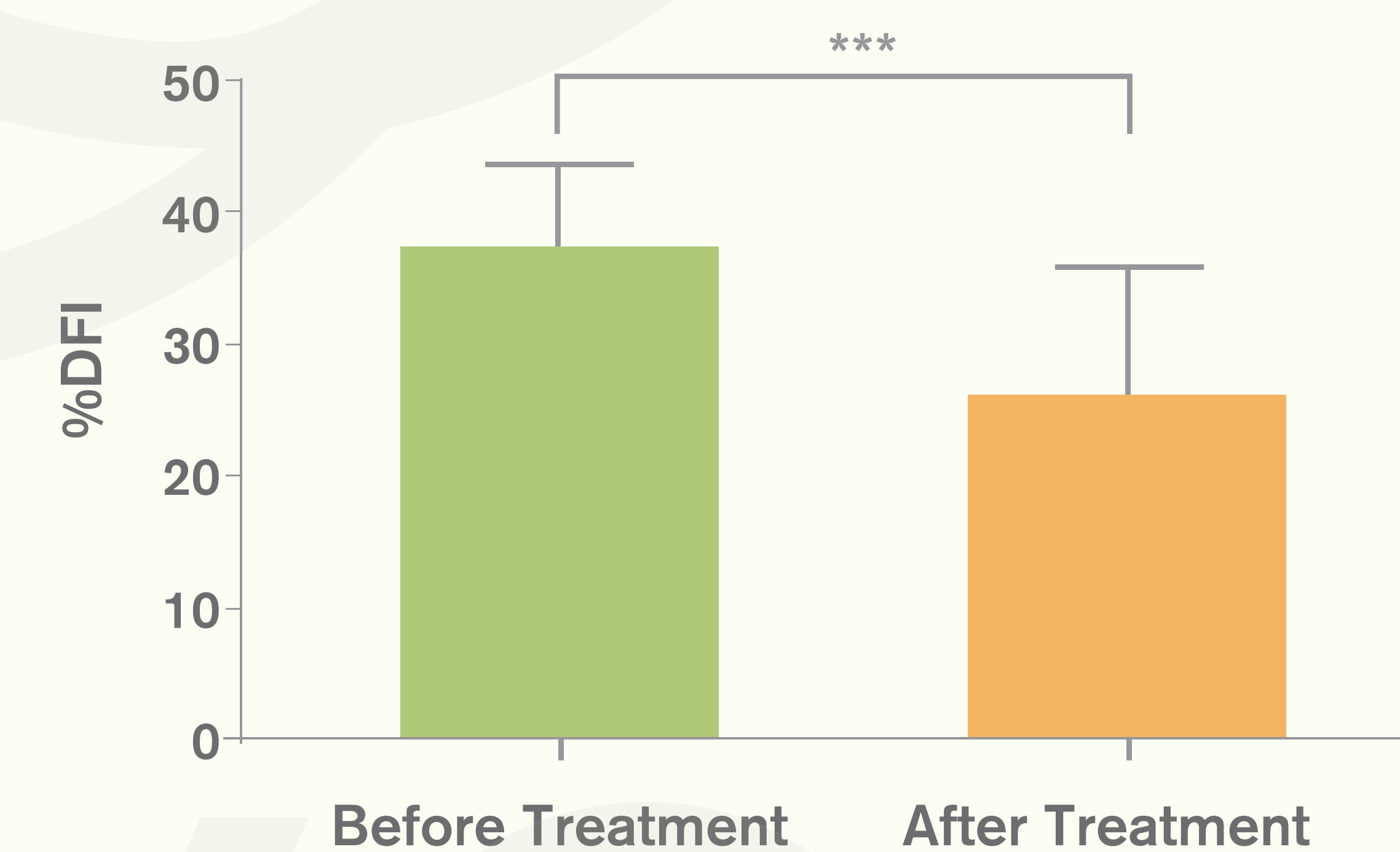


Figure 2. The % DFI comparison before and after treatment.



Mean % DFI (\pm SD) decreased significantly after oral anti-oxidant therapy (from $37.7 \pm 5.9\%$ to $26.6 \pm 9.2\%$, $***P < 0.0001$), with most patients (94%) experiencing a reduction in their % DFI after the therapy.

CONCLUSIONS

Our data show that infertile men may experience a reduction in sperm DNA fragmentation after oral antioxidant therapy. A similar improvement in chromatin integrity was not observed and may be explained by the requirement for a mild oxidative stress in the induction of sperm chromatin compaction. These data demonstrate the complex nature of sperm chromatin and the variable influence of oxidative stress on different sperm chromatin targets.

