

## ORIGINAL RESEARCH ARTICLE

# Deficiency of alpha-Tocopherol in Seminal Fluid as a Probable Factor in Low Fertility in Côte d'Ivoire

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### ABSTRACT

To evaluate the level of alpha-Tocopherol in seminal fluid of patients with low fertility, forty subjects with low fertility (17 with asthenospermia and 32 with oligoasthenospermia) and 21 subjects with normal sperm parameters were recruited into this study for assessing their alpha-Tocopherol seminal fluid level. The mean level of alpha-Tocopherol in subjects with normal sperm profile was 0.62  $\mu\text{mol/l}$  compared to those with pathological profile such as asthenospermia (0.29  $\mu\text{mol/l}$ ) and oligoasthenospermia (0.28  $\mu\text{mol/l}$ ). The determination of alpha-Tocopherol in human seminal fluid provides useful information concerning the exploration of low fertility in Cote d'Ivoire (*Afr J Reprod Health 2009; 13[3]:123-125*).

### RÉSUMÉ

**Carence en alpha-tocophérol du liquide séminal comme facteur potentiel de l'hypo-fertilité en Côte-d'Ivoire.** Nous avons effectué cette étude afin d'évaluer la carence en alpha-tocophérol du liquide séminal des patients souffrant de l'hypo-fertilité masculine. Nous avons retenu dans l'étude 49 couples dont les maris souffraient de l'hypo-fertilité (17 asthénospermiques et 32 oligoasthénospermiques) et 21 couples normaux pour l'évaluation de leur carence séminale en alpha-tocophérol. La carence moyenne en alpha-tocophérol des sujets normaux était de 0,62  $\mu\text{mol/l}$  comparé aux profils pathologiques (0,29  $\mu\text{mol/l}$ ) pour les asthénospermiques et 0,28  $\mu\text{mol/l}$  pour les oligoasthénospermiques. L'évaluation de la carence en alpha-tocophérol du liquide séminal humain a fourni des informations utiles concernant l'exploration de l'hypo-fertilité conjugale en Côte d'Ivoire (*Afr J Reprod Health 2009; 13[3]:123-125*).

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KEYWORDS: alpha-Tocopherol; Seminal fluid; Hypofertility; Cote d'Ivoire.

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## Introduction

Low fertility are major social and public health concerns in Côte d'Ivoire. Recent findings have shown that reactive oxygen species (ROS) have adverse effects on a range of sperm parameters including morphology and motility<sup>1</sup>. The sperm membrane is particularly susceptible to ROS damage<sup>2,6</sup>. To counteract the effect of ROS, semen must contain a number of antioxidant systems capable of reducing free radicals levels. An excessive amount of these free radicals in the ejaculate can initiate and propagate free radical chain reactions through lipid peroxidation of the spermatozoa membranes leading to sperm dysfunction<sup>1</sup>. Alpha-Tocopherol also known as vitamin E represents one of the most powerful antioxidant<sup>1,3,6</sup>. It also helps slow down the peroxidizing process of the ROS. In this study, alpha-Tocopherol level was determined in the seminal fluid of patients with low fertility

## Methods

We determined the level of alpha-Tocopherol in the seminal fluid of 49 subjects with low fertility (17 with asthenospermia and 32 with oligoasthenospermia) and 21 subjects with normal sperm parameters (control group). The subjects recruited into this study were those that were married and living with a spouse during at least 2 years, without any sexually transmitted infections or treatment and declared negative to sperm culture. Semen was collected by masturbation after three to five days of sexual abstinence and was

analyzed according to the world health organization guidelines<sup>7</sup>. Alpha-Tocopherol level was determined in the seminal fluid by liquid chromatography with fluorimetric detection according to a method described elsewhere<sup>4</sup>. Statistical analysis was performed using ANOVA test to compare mean differences between the three groups. Statistical significance was set at  $P < 0.05$ .

## Results and Discussion

Table 1 shows the results of the current study compared to those obtained by previous authors. A significant difference ( $P < 0.05$ ) was observed between the level of alpha-Tocopherol in the control group and the group of subjects with asthenospermia and those with oligoasthenospermia. Despite differences in laboratory methods and target population, our results are similar to those of three other reports in terms of significant differences between normal and pathological sperm profiles. According to Therond et al<sup>6</sup> the presence of alpha-Tocopherol in semen promotes the loss of free radicals activity. Subjects with low total antioxidant capacity in the semen had difficulty achieving pregnancy possibility compared to those with high rate<sup>1</sup>. Therapy with alpha-Tocopherol by oral route for low fertility may be considered as a potential treatment<sup>15</sup>. The determination of this antioxidant in this study provided useful information in the exploration of low fertility. However, further studies are needed to ascertain the level below which spermatozoa are exposed to ROS are protected from damage.

**Table 1:** Concentration of alpha-tocopherol in seminal fluid of patients with low fertility

|          | alpha-tocopherol concentration (µmol/L)         |   |   |
|----------|---|---|---|
|          | Control group                                   | Subjects with asthenospermia                    | Subjects with oligoasthenospermia               |
| Our Work | 0.62 ± 0.04 <sup>a</sup><br>(n=21) <sup>b</sup> | 0.29 ± 0.05 <sup>a</sup><br>(n=17) <sup>b</sup> | 0.28 ± 0.08 <sup>a</sup><br>(n=32) <sup>b</sup> |
| [3]      | 0.46<br>(n=18) <sup>b</sup>                     | 0.22<br>(n=16) <sup>b</sup>                     | nd <sup>c</sup>                                 |
| [5]      | 3.70<br>(n=20) <sup>b</sup>                     | 2.10<br>(n=20) <sup>b</sup>                     | nd <sup>c</sup>                                 |
| [7]      | 0.71<br>(n=12) <sup>b</sup>                     | 0.46<br>(n=15) <sup>b</sup>                     | nd <sup>c</sup>                                 |

<sup>a</sup> Values of alpha-tocopherol (µmol/L) are given as mean ± standard deviation;

<sup>b</sup> Number of specimen collected; <sup>c</sup> Non-determined

## References

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