

# Ascorbic Acid and Infertility Treatment

Crha I.,<sup>1</sup> Hrubá D.,<sup>2</sup> Ventruba P.,<sup>1</sup> Fiala J.,<sup>2</sup> Totušek J.,<sup>2</sup> Višňová H.<sup>1</sup>

<sup>1</sup> Department of Gynaecology and Obstetrics, Faculty of Medicine, Masaryk University, Brno

<sup>2</sup> Institute of Preventive Medicine, Faculty of Medicine, Masaryk University, Brno, Czech Republic

## SUMMARY

**Aim of the study:** To assess the ascorbic acid (AA) in the follicular fluid in women treated by in vitro fertilization and embryonic transfer levels (IVF/ET) and to analyse the influence of vitamin C supplementation on the results of infertility treatment.

**Type of the study:** prospective study in women treated by IVF/ET.

**Methods:** The influence of vitamin C supplementation on the outcome of infertility treatment in the assisted reproduction programme in 76 women (38 of them smokers, 38 non-smokers) was studied. Half the women (19 smokers and 19 non-smokers) were administered vitamin C in daily doses of 500 mg in so-called pellets allowing for gradual release over 8 to 12 hours. The control group consisted of the same number of smokers and non-smokers. In all the women, ascorbic acid levels were determined in two urine samples (prior to supplementation and at follicle retrieval) and in follicular fluid by means of a colorimetric method. Ovarian response to hormonal stimulation with gonadotropins (hMG, FSH) at a dosage of 150 - 225 IU per day combined with GnRH analogues in the short (buserelin) or long (triptorelin) protocols, and 5,000 - 10,000 IU of human chorionic gonadotropin was evaluated based on the number of follicles created and number of retrieved oocytes. Fertilisation was assessed, based on the number of successfully fertilised oocytes (fertilisation rate) and based on the number of cultivated embryos. The success of the infertility treatment was evaluated based on the number of pregnancies.

**Results:** Ascorbic acid levels in follicles were significantly higher ( $p < 0.001$ ) in women with vitamin C supplementation than in the control group ( $8.98 \pm 5.09$  vs.  $5.04 \pm 2.85$  mg/l). The administration of vitamin C during the period of hormonal stimulation showed a statistically insignificant impact in terms of the higher number of pregnancies (34.2% vs. 23.7%). Vitamin supplementation had a greater impact on the number of pregnancies in the non-smokers' group (57.9% vs. 31.6%). The pregnancy rate was significantly higher ( $p < 0.01$ ) in non-smoking women than in smokers - 44.7 % vs. 13.2 %, which appears to be a reason for asking women to cease smoking prior to infertility treatment.

*Key words:* ascorbic acid, follicular fluid, infertility, smoking

**Address for correspondence:** I. Crha, Department of Gynaecology and Obstetrics, Faculty of Medicine, Masaryk University, Obilní trh 11, 602 00 Brno, Czech Republic.