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Abstract

**Ozone/Oxygen ip in a preclinical cancer study* with an outlook in human-and
veterinary medicine**

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Introduction

The application of relatively large amounts of Ozone/Oxygen into the abdomen of laboratory animals is one useful technique to control possible therapeutic and/or toxicological effects of this gaseous mixture in different animal models with different disease entities. The aim of this study was to test the effects of an intraperitoneally insufflated gas mixture (called O3/O2-pneumoperitoneum) on the survival rate, the growth of the primary tumor and metastatic spread of the VX2 auricle cancer in New Zealand White rabbits.

Materials and methods

The first observations with Ozone/Oxygen ip from few rabbits with VX2 cell induced bi-auricular tumors encouraged us for a further pre-clinical with statistical significans. Altogether 41 male rabbits with an uni-lateral auricular tumor were used to show the possible efficacy of ozone/oxygen vs oxygen and sham animals as control by this method of application (O3/O2-PP). Ozone/Oxygen was insufflated with the Generator Medozon ip, Herrmann Apparatebau, D-Kleinwallstadt, Germany into short anaesthetized animals (Metomidine/Propofol). The single dosis of Ozone/Oxygen was 80 ml gas volume / kg. The concentration was 50 µg ozone in 1 ml of the gas mixture. After repetitive insufflations (x 5 days) from day 14 to 19 after the tumor cell inoculation, the total amount of ozone was 4 mg/kg. The period of observation was 90 days.

Results

In group O3/O2 (n = 14 rabbits) there was a survival of 50 % compared to O2 group (n = 13) with 23.1 % survival and compared to the sham group (n = 14) with only 7.1 % survival. There was a total tumor regression and prevention of metastasis in 6 rabbits from O3/O2 group (42.9 %) compared to 2 from the O2 group (15.4 %) and only 1 from sham treatment (7.1 %). Lymph node palpation, body weight development, hematological and clinical chemistry blood parameters, blood gas analysis and microbiological analyses of infected primary tumors are additionally recorded. Finally, the results of an immune suppression study of the cured rabbits and the necropsy of all animals, e.g. weight of parotid lymph nodes and lung metastases will be presented.

Discussion

These preclinical results showed the efficacy of Ozone/Oxygen ip on an established animal cancer model (VX2). This method of application has been used in other experimental disease entities of laboratory animals. There is now a challenge to find out more about detailed mechanisms from this form called O3/O2-PP, compared to other forms of ozone applications and in combination with other established therapies. Finally, further studies with O3/O2 in other experimental cancer models are necessary to justify therapeutical trials on carefully selected human and veterinary patients with spontaneous tumors.

* Schulz et al. Int J. Cancer, 2008 May 15;122(10): 2360-7