NITROUS OXIDE AND MAMMARY CARCINOMA

Sir,—In view of the favourable effect of nitrous oxide upon myeloid leukaemia (Eastwood et al., 1963) and lymphoma colony forming cells (Bruce, Lin and Bruce, 1970), we have examined the effect of nitrous oxide on mammary adenocarcinoma in mice.

After subcutaneous inoculation with tumour M8013 (mammary adenocarcinoma), one group of C₃HBl mice was placed in one cage in a flow of nitrous oxide 80% and oxygen 20% which was passed for 11 of 13 consecutive days. A second identical group spent 11 of 13 consecutive days exposed to nitrous oxide 50% in oxygen, and a third identical group was kept in air (control group).

On the 13th day, the mice were weighed, the tumour diameters were measured and the leucocytes were counted (after bleeding to death). No effect of nitrous oxide 80% or 50% was observed on the growth of the tumours or on the leucocyte count in peripheral blood.

However, there was an obvious difference in loss of weight in the mice exposed to nitrous oxide, especially to the larger concentration (table I). Subsequently, we determined if nitrous oxide (mostly 80%) had any influence upon the effect of cytotoxic drugs. Mice with or without mammary adenocarcinoma M8013 were treated every 2nd day with one intraperitoneal injection of a cytotoxic drug—vincristine (Oncovin) 0.5 mg kg⁻¹, actinomycin D (Lyovac cosmogen) 0.06 mg kg⁻¹ or cyclophosphamide (Endoxan) 50 mg kg⁻¹.

The mice were allocated to three groups, placed in a cage with nitrous oxide, one 2 h before, the second simultaneously with, and the third group 2 h after the injection of the cytotoxic drug. The animals remained approximately 20 h in nitrous oxide (overnight until the next morning). In most of these experiments, the combined therapy produced more weight loss and a higher mortality rate than nitrous oxide alone. The tumours of these mice were the same size as those in mice treated only with cytotoxic drugs, suggesting that nitrous oxide in combination with cytotoxic drugs did not influence M8013 mammary adenocarcinoma in C₃HBl mice.

If atropine 0.5 mg kg⁻¹ or atropine 0.5 mg kg⁻¹ with promethazine 1.6 mg kg⁻¹ or atropine 0.5 mg kg⁻¹ with propranolol 1.6 mg kg⁻¹ were administered i.v. just before placing the animals in nitrous oxide, there was less weight loss and a smaller mortality but no effect on the tumours, in comparison with mice treated with cytotoxic drug and nitrous oxide.

We conclude that the administration of nitrous oxide had no inhibitory effect on the growth of M8013 tumours in mice either alone or in combination with cytotoxic drugs.

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REFERENCES


CORRESPONDENCE

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