Hyperbaric Oxygen and Radiotherapy: Clinical Experiences

I.

Churchill-Davidson

From the St. Thomas' Hospital, London

From June, 1955 to April, 1965, a total of 235 patients whose tumours were so locally advanced that they were considered to have little, or no chance of cure by conventional radiotherapy, have been irradiated while they breathed oxygen at 3–4 atmospheres absolute pressure (29.4–44.1 lb/sq.in. gauge pressure). Although a fully randomised control series has not been possible, 81 patients with equally advanced disease, who for various reasons were unsuitable for treatment in the pressure chamber have, since July, 1957, been treated with the same dosage and fractionation while breathing air at atmospheric pressure.

Comparable evaluation of both series shows the survival is twice as great among those patients treated in high pressure oxygen as it is in those treated in air. Also,

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whereas no patients treated in air have so far been free from recurrence for more than 4 years, an average of 11% of patients treated in oxygen have been free from recurrence for periods of up to 9 years.

Especially good results have been obtained in treating tumours of the head and neck and uterine cervix. The response of secondary squamous carcinoma in lymph nodes is very markedly improved by using high pressure oxygen.

Moreover, the difference in the rate of sterilisation of the growth in the irradiated area is even greater than the difference in the number of long term survivors. Comparative figures for sterilisation are: Primary growth: H.P.0.2–56%, Air – 14%. Glands (head and neck tumours): H.P.0.2 – 73%, Air – 25%.

From the Columbia – Presbyterian Medical Center, New York City

Clinical Aspects of Hyperbaric Oxygen and Radiotherapy

New York Experiences

By C. H. Chang

The role of oxygen as a powerful modifier of radiation injury in the biological system has been well recognized. However, a significant improvement in clinical result in the radiotherapy of human cancer with hyperbaric oxygen has not yet been established. A clinical study of this kind is difficult because of variations in radiation treatment technique, oxygen pressure, fractionation and case material. Of special interest in the clinical study is the degree of normal tissue reaction, the tolerance of patients to the procedure, the complication and finally the cure rate. Of special importance is the plan of the clinical trial and study for maximum information which should be worked out with bio-statisticians before starting the clinical project.

O. Our experience with hyperbaric oxygen at the Columbia-Presbyterian Medical Center consists of an initial pilot study and subsequent randomization of patients with advanced cancer of the head and neck using hyperbaric oxygen at 4 atmospheres from 1960 to 1963 and an extension of

the clinical study to include glioblastoma multiforme and bilateral pulmonary metastases using hyperbaric oxygen at 3 atmospheres from 1963 to date. A brief resume follows: