Eur J Cancer Clin Oncol, Vol. 19, No. 7, pp. 1037–1038, 1983.
Printed in Great Britain.

0277-5379/83$3.00+0.00

Letter to the Editor

Adriamycin in the Treatment of Relapsed Primary Malignant Brain Tumours

CAROL MOONEY,* DAVID G. T. THOMAS† and ROBERT L. SOUHAMI*‡
**Department of Radiotherapy and Oncology, University College Hospital, Gower Street, London WC1 and †National Hospital for Nervous Diseases, Queen Square, London WC1, U.K.*

ONLY a small number of drugs are known to have activity against brain tumours. Reported response rates are of the order of 50% for BCNU [1], 40% for procarbazine [2], 47% for vincristine [3] and 35% for VM26 [4]. These drugs have usually been tested because of their lipid solubility and hence ability to cross a hypothetical blood–brain barrier. It is, however, possible that the normal blood–brain barrier is not a significant factor in impeding the success of chemotherapy for brain tumours since the capillary endothelium is abnormal. Many agents which have activity in other tumours have not been tested in patients with brain tumours. Adriamycin has been used in combination with CCNU and VM26 with a reported response rate of 66% [5]. There is little information about its effectiveness as a single agent. We have, therefore, carried out a phase II study of adriamycin in relapsed brain tumours.

Adriamycin was given to 15 patients, 14 of whom had histologically proven malignant brain tumours (Table 1). Seven patients had relapsed whilst receiving combination chemotherapy with procarbazine, CCNU and vincristine, and the time interval between this chemotherapy and adriamycin was as short as 4 weeks in 2 cases. Adriamycin is normally given every 2–3 weeks, as this is the usual time for bone marrow recovery. However, patients with recurrent brain tumours deteriorate very rapidly. Therefore, in an effort to intervene before the neurological deficit was too incapacitating, we gave adriamycin on a weekly basis, at the low dose of 30 mg/m^2.

When myelosuppression was encountered (usually after 4 injections) the interval between doses was increased. Patients needing dexamethasone to alleviate symptoms were stabilised on the drug before starting adriamycin. CT brain scans were performed prior to treatment and after every 4 injections, or when further tumour progression was suspected. Response was assessed on clinical criteria and on CT scan changes.

Table 1. Details of patients

No.	15
Mean age (range)	45 yr (6–67 yr)
Histology	
Glioblastoma multiforme	4
Astrocytoma	5
Oligodendroglioma	3
Brain stem glioma	1
Thalamic glioma	1
Temporal lobe glioma	1
Previous radiotherapy	14
Previous chemotherapy	7
Karnovsky score	
70–100	3
50–70	8
<50	4

Fourteen patients received at least 2 injections of adriamycin. Ten patients remained sufficiently stable to receive 4 doses. One was not clearly evaluable for response as all tumour recurrence had been excised, and she remained in clinical remission for 22 weeks. One patient had an equivocal response clinically and on CT scan, the duration of which was only 5 weeks. Three patients had stable disease, 2 of whom had not received prior chemotherapy. Eight patients clearly had progressive disease whilst having adriamycin chemotherpy.

Nausea and vomiting were encountered in 2 patients and oral mucositis also in 2 patients. Six

Accepted 17 January 1983.
‡To whom requests for reprints should be addressed.

patients experienced one episode of neutropenia, with a neutrophil count $<1.0 \times 10^9$, and one of these patients had an episode of septicaemia. Two patients had prolonged thrombocytopenia, but had had CCNU 4 weeks previously. There were no instances of bleeding. In 3 patients adriamycin was stopped because of myelosuppression.

Some of our patients had been treated with chemotherapy previously, which may lower response rates. The regimen used was of a relatively low dose given frequently because the poor prognosis on relapse allows very little time to assess further therapy. In spite of these reservations, the failure to observe a single response in 15 patients implies that adriamycin is ineffective in relapsed brain tumours.

REFERENCES

1. FEWER D, WILSON CB, BOLDREY EB, ENOT KJ, POWELL MR. The chemotherapy of brain tumours. Clinical experience with carmustine (BCNU) and vincristine. *JAMA* 1972, **222,** 549–552.
2. KUMAR ARV, RENAUDIN J, WILSON CB, BOLDREY EB, ENOT KJ, LEVIN VA. Procarbazine hydrochloride in the treatment of brain tumours. *J Neurosurg* 1974, **40,** 365–371.
3. ROSENSTOCK JF, EVANS AE, SCHUT L. Response to vincristine of recurrent brain tumours in children. *J Neurosurg* 1976, **45,** 135–140.
4. SKLANSKY BD, MANN-KAPLAN RS, REYNOLDS AF, ROSENBLUM K, WALKER MD. 4 Demethyl-epipodophyllotoxin-β-D-thenylideneglucoside (PTG) in the treatment of malignant intracranial neoplasms. *Cancer* 1974, **33,** 460–467.
5. POUILLARD P, MATHÉ G, HUGUENIN P *et al.* Traitement des glioblastomes inoperables par une combinaison d'adriamycine, de VM26 et de CCNU. *Bull Cancer (Paris)* 1977, **64,** 125–136.