

determine their response to antineoplaston therapy. In the patients with partial response and stable disease, the dose of corticosteroids remained the same or decreased.

The responses of all patients were evaluated by using the same technique, contrast-enhanced MRI. The two largest perpendicular diameters of the enhanced lesions were measured, and the sum of the products of all lesions was expressed in cm^2 .

After evaluation by the radiologist at the Burzynski Clinic, the films of all patients categorised as complete or partial responders and questionable cases were independently examined concurrently by Dieter Schellinger, MD, Professor of Radiology, Chief, Section of Neuroradiology, Georgetown Hospital, Washington, DC. The films were submitted to Dr Schellinger for four separate reviews in January, March and July of 1997, and May of 1998. The results of the final review were used for this publication.

All cases of stable disease were also confirmed by independent radiologists. Pathology slides were reviewed by Lucy B. Rorke, MD, Professor of Pathology, University of Pennsylvania, Philadelphia, PA.

Toxicity was evaluated, as recommended by the National Cancer Institute (NCI), and graded by NCI toxicity criteria. Pharmacokinetics and concentrations of antineoplaston ingredients in serum were reported to the FDA and EMEA (European Agency for the Evaluation of Medicinal Products). All data were entered into the clinical trials database management system at the Burzynski Clinic.

Statistical Analysis

Kaplan-Meier methods were used to obtain medial survival time and median time to progression. The response rates to treatment were calculated. This study had no control group and therefore statistical testing was not completed. Survival times and response rates were compared with those obtained in other research studies, but sufficient information regarding those studies was not available to complete statistical testing. Survival sum-

mary statistics, response rate and incidence of adverse events were obtained using the SAS® system, V. 6.12. All additional summary statistics were completed with Microsoft® Excel 97.

Results

Response to Treatment

Of the 36 evaluable patients, nine (25%) had a complete response to antineoplaston therapy. The MRIs of patients with glioblastoma multiforme (GBM) and anaplastic astrocytoma who had a complete response are shown in figures 1 and 2.

Seven (19.5%) patients had a partial response. In 12 (33.3%) patients, antineoplastons stabilised tumour growth. Eight (22.2%) patients developed progressive disease.

Toxicity

All 36 patients were evaluated for toxicity. The following adverse drug experiences (ADEs) possibly related to antineoplastons A10 and AS2-1 were identified: hypernatraemia, hypochloreaemia, hyperchloreaemia, hypokalaemia, skin rash, somnolence, weakness, nausea and vomiting, headaches, slurred speech, confusion, fever and fluid retention. Marked hypernatraemia (160 to 170 mEq/L) occurred in only two patients. Hypochloreaemia was identified in six patients, and hyperchloreaemia in one patient. Hypokalaemia not lower than 2.8 mEq/L was noted in seven patients. Fever up to 38.8°C occurred in one patient, skin rash in seven, weakness in five, somnolence in six, nausea and vomiting in two, headaches in one, slurred speech in one, confusion in one, and fluid retention in one patient.

Discussion

Basic research and clinical observations have indicated activity of the ingredients of antineoplastons A10 and AS2-1 against brain tumours.^[5-9] For more details regarding preclinical and phase I studies, the reader is referred to review articles. The history and controversy surrounding antineoplastons have also been studied extensively.^[10-12]