Symptomatic Treatment of Brain Tumor Patients with Sodium Selenite, Oxygen, and Other Supportive Measures

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ABSTRACT

Patients (16 women and 16 men) with brain tumors previously treated conservatively by surgery, radiation, and/or chemotherapy with typical symptoms of increased intracranial pressure were consecutively enrolled to test the effects of pharmacological dosages of sodium selenite (selenase®) in conjunction with other supportive therapies (biological response modifiers, detoxification, chemotherapy, immunotherapy, oxygen therapy). The rationale for the use of sodium selenite was that the whole-blood selenium levels were subnormal in 70% of the patients on admission. Patients also frequently presented abnormal levels of other minerals, especially lowered sodium and elevated potassium levels, which appears to be characteristic of brain tumor patients. Sodium selenite was administered by infusion at dosages of 1000 μg Se in physiological saline/d for 4–8 wk. In 76% of the patients, a definite, and in 24% a slight improvement of the general condition and a decrease in symptoms, such as nausea, emesis, headache, vertigo, unsteady gait, speech disorders, and Jacksonian seizures, were observed. In all treated patients, improvements of erythrocyte, hemoglobin, and thrombocyte counts were observed. Additional beneficial effects were noted in the patients receiving the oxygen therapy. It is concluded that the sodium selenite can be employed with oxygen therapy and other supportive measures in the management of brain tumor patients.

Index Entries: Brain tumors; sodium selenite; oxygen; symptomatic therapy.

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INTRODUCTION

Patients with brain tumors after conventional therapy frequently continue to suffer from headaches, nausea, emesis, vertigo, unsteady gait, speech disorders, and Jacksonian seizures owing to increased intracranial pressure, and therefore often require corticosteroids, analgesics, anticonvulsants, and sedatives. Since many of these drugs produce side effects, gradually case to be effective, or cannot be used indefinitely for other reasons, there is an obvious need for new treatment options. Since 70% of the incoming brain tumor patients at Klinik Friedenweiler were found to exhibit subnormal blood selenium levels, it was decided to administer sodium selenite to normalize blood Se in these patients. Additional positive therapeutic effects were expected, because sodium selenite is known to pass the blood–brain barrier readily. As a potent electron transfer catalyst, selenite furthermore has been shown to activate the Na,K-ATPase of the brain as well as other enzymes or cellular receptors whose activity depends on protein-SH or -S-S-groups (1). Selenite also acts as an anti-inflammatory, antiproliferative, antimutagenic, anticarcinogenic, and selectively cytotoxic agent (2). Directly relevant within this context are reports in the literature showing that selenite inhibits the growth of human A172 glioblastoma and rat C6 glioma cells (3), and prolongs the survival of rats with transplanted C6 gliomas (4). The first patient, a 20-yr-old man with a glioblastoma multiforme, was initially treated with sodium selenite infusions in February 1988 only to normalize his low blood selenium level. After this patient showed a surprising improvement in his overall condition, it was decided to apply this treatment to a larger number of patients with brain tumors of different types in conjunction with additional supportive measures.

PATIENTS AND STUDY DESIGN

Patients

A total of 32 patients (16 M, ages 20–62 yr, 16 F ages 27–56 yr) were consecutively enrolled in this study from 1988 to 1995 at Klinik Friedenweiler, Germany. Of these, 12 (37.5%) had received treatment for histologically confirmed glioblastoma, 10 (31.25%) for astrocytoma, 4 (12.5) for oligodendro-glioma, 2 (6.25%) for glioma, 1 (3%) for an astrocytoma/oligo-dendro-glioma, 1 for an astrocytoma with parts of a glioma, 1 (3%) for cerebellar metastases, and 1 (3%) for a metastatic renal cell carcinoma. The tumor localization was left in 21 or 66% and right in 11 or 34% of the patients. Of these 32 patients, 26 (81%) had been treated surgically, 24 (74%) had received radiation therapy, and 6 (19%) cytotoxic chemotherapy, in part in combination. The patients presented with headaches, vertigo, nausea, vomiting, lethargy, visual and speech disturbances, difficulties in word-finding, memory loss, difficulties in concentrating,