OBJECTIVE. Gliomatosis cerebri is a rare brain tumor with a short survival time; for this reason, it is difficult to establish the degree of aggressivity in vivo. The MR spectroscopic findings on this tumor often do not agree with choline level. The purpose of this study was to evaluate whether MR spectroscopy can be used to measure tumor choline levels and whether the findings give useful information about tumor growth rate and patient survival time.

SUBJECTS AND METHODS. We performed MRI and \(^1\)H MR spectroscopic studies on seven treatment-naive patients with gliomatosis cerebri and on 16 healthy volunteers. We then analyzed the association between survival time and levels of choline (Cho) and N-acetyl aspartate (NAA) normalized to creatine (Cr).

RESULTS. The results showed a statistically significant (\(p = 0.05\)) inverse relation between Cho/Cr ratio and survival time. In addition, NAA/Cr ratio was significantly lower in the patient group than in the control group (\(p = 0.001\)).

CONCLUSION. Cho/Cr ratio measured with MR spectroscopy seems to be related to survival time, possibly explaining the inconsistent findings previously reported for this parameter.

Gliomatosis cerebri is a rare tumor, fewer than 300 cases having been reported in the medical literature [1, 2]. In the World Health Organization (WHO) classification of CNS tumors, gliomatosis cerebri is defined as a diffuse glial tumor involving at least two brain lobes. It is often bilateral and frequently extends to infratentorial structures, including the spinal cord [3]. The histogenesis is currently unknown, and this neoplasm has been included in the category of neuroepithelial tumors of uncertain origin.

Gliomatosis cerebri is essentially diagnosed when MRI studies show diffuse and contiguous infiltration of the white matter that is isointense on T1-weighted sequences and hyperintense on T2- and proton density–weighted sequences. Brain structure is preserved, frequently with bitemporal extension through commissural pathways, such as the corpus callosum, to the basal ganglia and brainstem [4–6]. In most cases, brain biopsy is performed for antemortem diagnosis [7], although it is possible to diagnose this tumor with imaging criteria because the MRI appearance is quite distinctive. Biopsy specimens are often difficult to evaluate [8] often making it impossible to assess the degree of aggressivity of this tumor. In addition, areas of the lesion have varying degrees of cellular proliferation and differentiation, as autopsy studies have shown [9]. Stereotactic brain biopsy does not yield information useful for prognosis in cases of gliomatosis cerebri [8]. Furthermore, the surgical procedure involved in brain biopsy, however minimal, is not exempt from mortality and morbidity [7].

MR spectroscopy (MRS) is a noninvasive diagnostic method that can be used for metabolic characterization of brain tumors. Use of MRS in gliomatosis cerebri has been reported only fairly recently [10], and the largest published series to date is nine cases [8]. The most common finding in gliomatosis cerebri is a decreased level of N-acetyl aspartate (NAA). The existence of a peak in myoinositol-to-glycine ratio has also been described as characteristic of gliomatosis cerebri, especially in the absence of elevated choline (Cho) level [10–13]. The existence of a peak in myoinositol-to-glycine ratio has also been described as characteristic of gliomatosis cerebri, especially in the absence of elevated choline (Cho) level [11–13]. In the case of choline, however, there are discrepancies in the literature. Although some authors have reported a moderate increase in this metabolite in patients with gliomatosis cerebri [10–13], others have described normal values [1, 8]. To the best of our knowledge, this discrepancy has not been explained. The purpose of our study was to study the differences, tak-