Efficacy of temozolomide for recurrent embryonal brain tumors in children

Chung-Hao Wang · Ting-Rong Hsu · Tai-Tong Wong · Kai-Ping Chang

Received: 1 November 2008
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Abstract

Objective The salvage therapy of recurrent embryonal brain tumors in children is disappointing. Temozolomide is a newly developed chemotherapeutic agent in central nervous system tumors. This study analyzed the efficacy of temozolomide on the treatment of recurrent embryonal brain tumors in children.

Materials and methods There were eight patients, including four with medulloblastoma (MB), three with atypical teratoid/rhabdoid tumor (AT/RT) and one with supratentorial primitive neuroectodermal tumor, whose tumors recurred after surgery and radiotherapy, with or without conventional intravenous cisplatin-based chemotherapy. They all received once daily oral temozolomide (150 mg/m²/day) for five consecutive days in a 28-day cycle. The responsiveness of the tumors to temozolomide was judged by magnetic resonance imaging (MRI) during regular follow-up.

Results The median treatment cycles received by these eight patients were 17 (range from two to 59 cycles). The follow-up MRI showed no tumor progression in five patients at 6 months and four patients at 12 months. The median progression-free survival (PFS) of the eight patients was 15.7 months (range from 0 to 59 months). Complete response was achieved in one patient with MB accompanying with a long period of PFS for 26 months. Another patient with AT/RT showed partial response accompanying with a long period of PFS for 59 months. The observed adverse effects of temozolomide included nausea, vomiting, headache, constipation, mild marrow suppression, and decreased activity; none of them was severe enough to discontinue the treatment. No patient experienced moderate or severe marrow suppression in this series.

Conclusion In this preliminary study, oral temozolomide shows promising results on recurrent embryonal brain tumors in children. The adverse effects of temozolomide are mild and tolerable. When conventional chemotherapy fails and/or the adverse response is too severe to tolerate, temozolomide is a reasonable alternative. However, a further well-designed, controlled study and more long-term follow-up are needed to assess the exact role of temozolomide in children with embryonal tumors in brain.

Keywords Children · Embryonal tumor · Medulloblastoma · Temozolomide

Introduction

According to the World Health Organization (WHO) classification published in 2000, embryonal brain tumors include medulloblastoma (MB), supratentorial primitive neuroectodermal tumor (sPNET), atypical teratoid/rhabdoid tumor (AT/RT), ependymoblastoma, and medulloepithelioma [6]. MBs are the most common of the embryonal tumors and approximately constitute 13–20% of all primary pediatric brain tumors. All the other embryonal tumors are rare, with most examples of ependymoblastomas and