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ORIGINAL ARTICLE

# Low-grade gliomas: Review of 10 years☆

M.J. Pardal Souto[a,*], C. Hernández Marqués[b], A. Lassaletta Atienza[b], D. Ruano[b], M. Cormenzana[b], L. Madero[b]

[a] *Servicio de Pediatría, Hospital Virxe da Xunqueira, Cee, La Coruña, Spain*
[b] *Servicio de Hemato-Oncología Pediátrica, Hospital Infantil Niño Jesús, Madrid, Spain*

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**KEYWORDS**
Low-grade;
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**Abstract**
*Introduction:* Central nervous system (CNS) tumours are the most common solid tumours in children. Among these, the low-grade gliomas are the most common type, accounting for up to 30–50% of them.
*Patients and methods:* A retrospective analysis was carried out on the epidemiology, clinical characteristics, tumour location, histology, treatment, outcome and long-term sequelae of 111 patients diagnosed with low-grade glioma in the Niño Jesús Children's Hospital of Madrid from January 2002 to December 2011.
*Results:* Of the 111 patients, there were 57 boys and 54 girls. The mean age was 7.26 years (range, 2 months–19 years). The most common symptoms of presentation were headache (27%) and vomiting (19%). The most common locations were the cerebral hemispheres (38%), followed by the brainstem (27.4%), and cerebellum (18.5%). Histological examination was performed in 89 patients (80.18%). Pilocytic astrocytoma was the most common histological type. Diagnostic biopsy was performed in 20 patients (22.5%), partial resection in 38 patients (42.7%), and total resection in 31 patients (34.8%). Sixteen patients received chemotherapy (14%), and eighteen patients received radiotherapy (16%). Overall survival was 88.3%. Long term hearing, visual and endocrine sequelae were noted in one, five, and four patients, respectively.
*Conclusions:* The most common histological type is pilocytic astrocytoma. Overall survival was 88.3%. Only 9% of patients had some kind or auditory, visual or endocrine sequelae.


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* Corresponding author.
*E-mail address:* chusps1@hotmail.com (M.J. Pardal Souto).

**PALABRAS CLAVE**
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**Gliomas de bajo grado: revisión de 10 años**

**Resumen**
*Introducción:* Los tumores del SNC son los tumores sólidos más frecuentes en la edad pediátrica. Dentro de ellos los gliomas de bajo grado constituyen el tipo más común de tumour del SNC en niños, representando hasta el 30–50% de los mismos.
*Pacientes y métodos:* Análisis retrospectivo de las características epidemiológicas, manifestaciones clínicas, localización del tumour, histología, tipo de tratamiento si lo ha recibido, evolución y secuelas a largo plazo de 111 pacientes diagnosticados de glioma de bajo grado en el Hospital Infantil Universitario Niño Jesús de Madrid entre enero de 2002 y diciembre de 2011.
*Resultados:* De los 111 pacientes 57 eran niños y 54 niñas. La edad media fue de 7,26 años (intervalo 2 meses-19 años). Los síntomas de presentación más frecuentes fueron la cefalea (27%) y los vómitos (19%). Las localizaciones más frecuentes fueron los hemisferios cerebrales (38%), seguido del tronco cerebral (27,4%) y del cerebelo (18,5%). Se realizó estudio histológico en 89 pacientes (80,18%), siendo el astrocitoma pilocítico el tipo histológico más frecuente. Se realizó biopsia diagnóstica en 20 pacientes (22,5%), resección parcial en 38 pacientes (42,7%) y resección total en 31 pacientes (34,8%). Recibieron quimioterapia 16 pacientes (14%) y radioterapia 18 pacientes (16%). La supervivencia global fue del 88,3%. Un paciente presentó secuelas auditivas, 5 pacientes presentaron secuelas visuales y 4 pacientes secuelas endocrinas.
*Conclusiones:* El tipo histológico más frecuente es el astrocitoma pilocítico. La supervivencia global fue del 88,3%. Solo el 9% de los pacientes presentaron algún tipo de secuela auditiva, visual o endocrinológica.


## Introduction

Tumours of the central nervous system (CNS) are the most frequent solid tumours in the paediatric age group. Among them, gliomas are unquestionably the most common subtype, accounting for 46–70% of the patients in published case series.[1]

Gliomas are a heterogeneous group of tumours that are classified histologically into two groups, low-grade and high-grade, as specified by the World Health Organisation (WHO) criteria published in 2007.[2] Low-grade gliomas are the most common type in the paediatric population, accounting for 30–50% of CNS tumours.[3–6]

In the WHO classification scheme, low-grade gliomas can be further classified as grade I (pilocytic astrocytoma) or grade II (fibrillary astrocytoma) tumours (Table 1).[2] While the cerebellum is the most frequent location for gliomas, they can appear anywhere in the CNS. The symptoms vary according to location and usually appear months before the diagnosis. Surgery is the mainstay of treatment, and complete resection is the most important predictor of survival.

In this review we have conducted a retrospective analysis of the cases of 111 paediatric patients with low-grade gliomas diagnosed at the Hospital Infantil Universitario Niño Jesús over a 10-year period.

## Patients and methods

We conducted a retrospective study of the patients diagnosed with low-grade glioma at the Paediatric Oncology Department of the Hospital Infantil Universitario Niño Jesús in Madrid over a period of 10 years, between January 1, 2002 and December 31, 2011.

For each patient, we collected data on demographic characteristics (age, sex), clinical manifestations, time to diagnosis, tumour location, histology, type of treatment received (if any), outcome, and long-term sequelae. The inclusion criteria for patients were the following: (a) age at diagnosis equal to or lower than 20 years; and (b) grade I or II glial tumour, as defined by the WHO classification, or low-grade glioma diagnosed on the basis of magnetic resonance imaging (MRI) findings. Gliomas were diagnosed as low-grade when MRI scans showed homogeneous intraaxial lesions that appeared hypointense in T1- and hyperintense in T2-weighted images, with minimal or absent post-contrast enhancement. Diffusion or spectroscopic MRI was performed in some patients, classifying gliomas as low-grade when they showed no resistance to diffusion and no alterations in N-acetylaspartate, choline and lipid peaks, respectively.[7–9]

## Results

During the 10 years of the study, a total of 111 patients were diagnosed with low-grade glioma in the Hospital Infantil Universitario Niño Jesús of Madrid. Of those 111 patients, 57 were boys (51.4%) and 54 girls (48.6%). The mean age at diagnosis was 7.26 years, with a standard deviation of 7 years (range, 0.16–18.66 years).

The most frequent presenting symptom was headache (27%), followed by vomiting (19%), epileptic seizures (18%), ataxia (16%) and cranial nerve involvement (14%). Three patients (2.7%) had onset with torticollis and one (0.9%) with visual and auditory hallucinations. Five of the patients