Puberty and pituitary-gonadal axis function after treatment for a childhood brain tumor

M Rosimont1, D Khatayyasam1, D Samara-Boustami2, E Guita3, J Beltrand4, A Belle4, B Fresneaux5, S Puget6, C Sainte-Rose1, C Alapetite6, G Pinto2, P TOURNEAU4, 6, M-L PILKET6, 6, S BRABANT7, S ABBOUR2, I AERTS2, K BECCARIA2, M BOURGEOS1, T ROUJEAU2, T Blauwblomme2, F DI ROCCO8, C THALASSINOS2, M ZERAH1, C PAUWELS9, C RIGAUD9, S JAMES9, K BUSIAH9, A SIMON9, F BOURDEAULT9, L LEMELIE9, L GUERRINI-ROUSSEAU9, DORBACH8, 10, F DOUX11, C DUFOUR12, J GRIFF12, M POLA12, L GONZALEZ-BRICE12.


INTRODUCTION

Primary malignant central nervous system (CNS) tumors are the second most common childhood malignancies (25%). Late effects during follow-up, including pituitary-gonadal axis dysfunction and repercussions on puberty and fertility may alter the quality of life of survivors.

To describe the pituitary-gonadal axis function of patients who were treated for a primary brain tumor more than 5 years ago in order to try to refine the risk factors for the different dysfunction.

METHOD

We included 204 patients diagnosed with a primary brain tumor before 18 years, followed in pediatric endocrinology at the University Hospital “Necker-Enfants Malades” in Paris between January 2010 and December 2015. Data was retrieved from medical records. Untreated gliomas and pituitary adenomas were excluded. Analysis of pituitary-gonadal axis function was made according to tumor type or location (suprasellar – SS or non suprasellar – NSS).

RESULTS

Suprasellar glioma is associated with early puberty in 60% of cases in comparison with 10% in non suprasellar glioma. The higher risk of early puberty is SS glioma treated without radiotherapy (65%) compared those treated with radiotherapy >30Gy (33%). The PPV reach 70% if the patient with SS glioma treated without radiotherapy was <5 years old at diagnosis compared patients with >5 years old at diagnosis (40%).

Medulloblastoma is associated with risk of gonadal toxicity in 70% of cases because of high risk chemotherapy received, and until 87.5% if the patient is <5 years old at diagnosis. The risk is 0% if the patient doesn’t receive any chemotherapy and the risk is intermediate if the patient is treated with moderate risk chemotherapy.

Craniohypophyseal is associated with risk of hypogonadotropic hypogonadism because of the tumor itself in 70% of cases. There is not risk factor as age, sex or treatment, which increase this PPV. The predictive factor is having GH deficiency with PPV of 80%.

CONCLUSIONS

The type of tumor, its location and treatment are the main factors that guide the risk for pituitary-gonadal axis dysfunction. Awareness concerning potential late effects is essential to guide parental and child information, medical surveillance and adequate and timely hormone replacement therapy.

mrosimont@student.ulg.ac.be