Romanian Neurosurgery | Volume XXX | Number 4 | 2016 | October - December

Article

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INDIA

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DOI: 10.1515/romneu-2016-0078

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Neuropsychiatric presentations of pediatrics brain tumors: cases series

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Abstract: Brain tumors constitute the second most common tumors in the pediatric age group after the leukemias. Symptoms and signs depend on growth rate of tumor, its location in the central nervous system, the extent of peri-tumoral vasogenic edema and the age of the child. Most common neuropsychiatric problems reported in children with brain tumor(s) include adjustment problems, anxiety disorder, neurocognitive deficits and depressive disorder as reported by very few case reports and isolated observational data. To the best of our knowledge no similar data or reports are as yet published from India on the similar lines. We wish to report case series of neuropsychiatric presentations in different types of brain tumors observed at our rural tertiary care multi-speciality hospital.

Key words: Neuropsychiatric manifestations, brain tumors, pediatric

Introduction

Neoplastic brain tumors may be broadly divided into two types, namely those neoplasms that are primary to the brain and those that represent metastases from systemic cancers such as bone or lungs. Brain tumors constitute the second most common tumors in the pediatric age group after the leukemias. (1) Pediatric brain tumors are not similar to adult tumors in many ways. Childhood brain tumors demonstrate greater histological variation. In addition, meningioma, malignant gliomas, schwannomas and pituitary tumors are common in adults; however these tumors are rare in children. In children more than 50% of the brain tumours are infratentorial and embryonal in origin and the common tumours are low grade gliomas and primitive neuroectodermal tumours. (2-3) Gliomas represent 45 – 50% of all the pediatric primary brain tumors and are by far the commonest of them. (4-5) Symptoms and signs depend on growth rate of tumor, its location in the central nervous system (CNS), the extent of peri-

tumoral vasogenic edema and the age of the child. The overall symptomatology may be divided into following domains: headache; non-focal symptoms, focal signs and symptoms and specific syndromes such as intellectual deterioration or seizures. (6) The treatment of these pediatric brain tumors involve only surgery (eg, children with a pilocytic astrocytoma) or have surgery, radiation, and intensive chemotherapy (eg, children with medulloblastoma). (7,8) The overall 5 year survival rate of pediatric cancers increased from 62.9% in 1970's to 81.5% in 2001. (9) Most common neuropsychiatric problems reported in children with brain tumor(s) include adjustment problems, anxiety disorder, neurocognitive deficits and depressive disorder as reported by very few case reports and isolated observational data. To the best of our knowledge no similar data or reports are as yet published from India. We report cases series of brain tumor with differential neuropsychiatric presentations as seen and illustrated while treating them.

Case Vignettes

Case 1

9 years old male child presented with insidious onset of dull aching continuous, headache fronto-temporal region, gait disturbance (magnet in type) and two episodes of generalized tonic-clonic seizures lasted for 15-30 seconds associated with urinary incontinence. His T2 weighted MRI showed 6 x 7 cm homogenous mass at right fronto-parietal region with gadolinium enhancement. On mental state examination child was irritable, sad and pre-occupied with pain and was having cognitive deficit in speech, language and memory domains. He had undergone surgical treatment in the form of ventriculo-peritoneal shunting and removal of large tumor which was found to be meningioma.

Case 2

A 5 years old girl presented to psychiatric outpatient services with dizziness and hypersomnalance along with excessive eating and weight gain. Her BMI was 29.2 and was grossly reluctant to go to school (school phobia). She was brought to emergency department when she sustained two episodes of consecutive days morning omitting and one episode of loss of consciousness precipitated by lip-smacking movements, automatism and hallucinatory behavior. She was found to have 2 cm of non-enhancing mass at temporal lobe with increased signal intensity on T2 weighted image. On mental status examination, she was found to have moderate depressive disorder borderline intelligence and binge type eating disorder.

Case 3

8 years old female child was incidentally brought to pediatrics department with complaints and difficulty in walking, eye to hand co-ordination, nystagmus, coarse tremors, and speech difficulty, reading and arithmetic problems. On physical examination, cerebellar signs were grossly present. MRI brain showed 3 x 4 cm midline cerebral tumor protruding into 4th ventricle suggestive of "medulloblastoma". Her IQ was 78. She was referred to neurosurgery for further treatment.

Case 4

13 years old Male child was brought by his parents with presentation of rapid cycling affective disorder (RCAD) since last 6-7 moths. His symptoms of excessive eating, excessive sleepiness (18-20 hrs), irritable and labile mood with inability to concentrate on studies, excessive demands for different eatables and withdrawal behavior, becoming aggressive when confronted by family members to restrict his food, sleep or to focus on study. He would remain better spontaneously for 1-2 wks and again continue to have similar semiology of symptoms in the cyclic pattern. He could not go to school during his symptomatic phase. On examination, he was found to have bitemporal hemianopia. His MRI brain showed calcified 2 x 2 cm two discrete nodules, one at hypothalamus and other at left anterior cingulated gyrus. His RCAD was effectively treated with sodium valporate 600 mg per day, with Olanzepine 5 mg per day and was subsequently referred to the department of Neurosurgery.

Case 5

A 6 years old male child was brought to emergency pediatrics department with complaints of Acute Onset of Paroxysmal episodes of 4-5 convulsive seizures began from the right half of the extremity and involved whole body, followed by post-ictal confusion and state of flaccidity. His MRI showed left temporo-parietal 65 x 57 mm low intensity non-enhancing homogenous mass. On mental status examination he was found to have fearfulness, forgetfulness, insomnia and perceptuo-cognitive deficit. He underwent craniotomy and histopathology showed Grade III Astrocytoma.

Case 6

12 years old female presented to ENT department with complaining of left sided headache, tingling numbness sensations on left half of face, elementary auditory hallucinations, 3-4 episodes of sensory motor seizures without secondary generalizations. Her MRI brain showed left parietal 32 x 36 mm heterogenous density non-enhancing mass. The diagnosis of organic schizophreniform psychosis secondary to brain tumor was considered. She underwent craniotomy and her histopathology showed that it was indolent gangliocytoma containing both neural and glial elements.

Case 7

A 9 year old male child was diagnosed as acute lymphoblastic leukemia. He underwent 3 cycles of recommended chemotherapy predominantly intravenous and intrathecal methotrexate. Further he received about 1800 cGy cranial irradiation as part of CNS prophylaxis. Thereafter he had been observed to be in complete remission for about a year. However, he was referred from school to psychiatric services for newly developed problems in reading and arithmetic skills, paroxysms of panic attacks, nightmares and wish to die which were quite prominent and were unlike to his premorbid self.

Case 8

A 5 year old male child presented to pediatrician with 3-4 month history of morning vomiting, gait disturbance and excruciating headache at occipital region with

crying spells and insomnia. His headache had not responded to NSAID's prescribed by local physician. His MRI brain showed 4 x 7 cm, homogenous, hyperintensity, non-enhancing mass in cerebellar region involving vermis suggestive of cerebellar astrocytoma. He underwent successful extensive surgical resection. His histology showed pilocytic tumor with biphasic pattern with varying proportions of bipolar cells with Rosenthal fibers and loose multipolar cells with microcysts. On day 2 post-operatively he developed delirium, hyperactive type secondary to infection/hypoxemia/anemia. He remained hospitalized in intensive care unit for next two weeks and recovered completely.

Discussion

Brain tumour is probably one of the most terrifying diagnoses, a child and his or her loved ones will ever hear. The degree of psychological emotional expressiveness in children with brain tumor (s) and its possible effect on prognosis have been the subject of interest of a large body of literature. Few descriptive case reports noted shorter survival both in adolescent and adult patients with depressed, resigning attitude compared with patients who were able to express more negative emotions, such as anger. 10 Frontal lobe tumors in children is often accompanied by apathy, dullness and somnolence. (11) Tumors of thalamus and hypothalamus may also cause intellectual deterioration along with additional symptoms like hypersomnolence, weight gain or diabetes insipidus. (11, 12) Development of dementia or personality changes which is often seen in frontal lobe tumors in adult are not practically possible or documented. Mania may uncommonly occur with tumors of mesencephalon, hypothalamus, cingulate gyrus or frontal lobe; similarly psychosis may occur with tumors most commonly of the temporal lobe followed by frontal lobe and corpus callosum. (11, 13)

Unlike in adults with brain tumors in whom the wide spectrum of neuropsychiatric presentations are being reported; the focus in pediatric age group has been largely on issues of adjustment, emotional and mood disorder and cognitive impairment. (11,14) However, in our case series we observed evolution and persistence of sleep disorders, psychosis, delirium, eating disorder, rapid cycling affective disorder and panic attacks in addition to previously documented presentations. Finally, neuropsychiatric presentations in children with brain tumor commonly changes over the course of illness and depends on medical, psychological and social factors: the disease itself (i.e., site, symptoms, clinical course, side effects of chemotherapeutic agents or radiations); prior levels of adjustment; the threat that cancer poses to attaining age appropriate developmental tasks and goals; cultural, religious and spiritual attitude; presence of emotionally supportive persons or caregivers; the potential for psychological and physical rehabilitation; and finally child's temperament and coping style as well as prior experience with loss.

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