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Case Report on Neuroblastoma

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ABSTRACT

The most common intra-abdominal and extra-cranial solid tumour in children is neuroblastoma, derived from a neural crest. The etiology is not known, but there are family cases and neurofibromatosis, hirschprung disease, and friedreich ataxia are related, etc. Patient History: A 4 years old, female child was admitted on 7.1.2020 at BJWHC, Mumbai for the second dose of intravenous Immunoglobulin (IvIg). Incoordinate walking, abnormal eye movements, speaking difficulty. WBC: 14.95 10^3/UL, Lymphocytes: 4.77 10^3/UL, Hb: 10.6g/dL, Platelets: 332 10^3/UL, ALT/SGPT: 18 IU/L, Ultrasonography: Abdominal Mass, Biopsy: S/o Extra-Adrenal Neuroblastoma. Inj. Human Normal Immunoglobulin 5% 2mg/kg IV x OD. Outcome: the condition of patient was improved after treatment was given. Her eye movements and way of walking were gradually improved. Patient was admitted to Paediatric Ward XV, BJWHC, Mumbai with a known case of Neuroblastoma. Follow-up treatment were started and condition of patient was improved.

KEY WORDS: NEUROBLASTOMA, NEUROFIBROMATOSIS, HIRSCHPRUNG DISEASE, FRIEDREICH ATAXIA, IMMUNOGLOBULIN.

INTRODUCTION

The most common extracranial solid tumour in infancy is neuroblastoma. It is a sympathetic nervous system embryonic malignancy resulting from neuroblasts (pluripotent sympathetic cells). The distribution patterns of these cells correspond with the presentation sites of primary neuroblastoma. Significant prognostic factors are age, level, and biological characteristics present in tumour cells and are used for risk stratification and treatment assignment. The variations in results are striking for patients with neuroblastoma. Excellent prognosis and outcome in patients with low-risk and intermediate-risk neuroblastoma (Coppes MJ, et.al 2017).

Neuroblastoma in the sympathetic nervous system can occur anywhere. Depending on the anatomical location of the tumour, clinical signs are varied and differ. Most tumours arise in the abdomen (65%), most of which derive from the adrenal gland (Mueller S 2009 & Ward E 2014).

Most infants with neuroblastoma may be treated with moderate-intensity chemotherapy, except with metastatic disease, and certain patients with a special pattern of metastasis have a high chance of spontaneous regression without chemotherapy (Diede SJ 2014). While tumours can occur anywhere along the sympathetic nervous system, most primary neuroblastoma occurs within the abdomen, especially from the adrenal gland. Neuroblastoma range from spontaneous relapse to metastatic and treatment-resistant diseases and are clinically complex. Patients with neuroblastoma are categorized according to risk categories for pretreatment: very medium, low, moderate and high risk (Cohn SL 2016).

Bone, bone marrow and liver metastases are common in patients at high risk. High-risk disease management methods include high-dose chemotherapy, surgery, radiotherapy and anti-GD2 immunotherapy (Maris JM. 2007) Incidence: Neuroblastoma is the most prevalent childhood intra-abdominal and extra-cranial solid

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tumour, responsible for 7-8% of all tumours, with about 90% of patients presenting before 5 years of age (Datta Parul 2018).

Patient Identification:

- Patient Present History: A female child of 4 years old from Pune was admitted to Paediatric Ward XV, Bai Jerbai Wadia Hospital for Children (BJWHC) on 7th January, 2020 with a known case of Neuroblastoma. She was 15.6 Kg. and 90 cm. in height on the time of admission.
- Past Medical History: Patient had difficulty walking when she was 1.5 years old and also had abnormal eye movement and difficulty speaking. Her parents brought to private hospital and was diagnosed with Neuroblastoma and operated in 2017. After surgery, she was referred to Tata Memorial Hospital, Mumbai for further treatment.

Birth History:

Prenatal History:

- Nature of Marriage: Non-Consanguineous
- Exposure to Radiation: None
- Antenatal Check-Up: Done

Perinatal History

- Type of Delivery: Full Term Normal Delivery.
- Place of Delivery: Govt. Hospital.
- Mother condition following Delivery: Mother had no complications following delivery.

Post Natal History:

- Child condition at birth: Normal
- NICU Stay: None
- Immunization History: Patient received immunizations according to her age group as per Immunization Schedule.
- Family History: There are five members in the family. My Patient was diagnosed to have Neuroblastoma. Her grandmother has undergone treatment for Type II Diabetes Mellitus. Other members were not having complaints in their health aspect.

Clinical Findings: Incoordinate walking, abnormal eye movement, difficulty speaking, Anaemia (Hb – 10.6g/dL).

Genetics: The Myc-N oncogene is used as a biomarker for risk stratification, encoding the N-myc proto-oncogene protein (Bagga Arvind).

Physical Examination: Patient looks weak and not much co-operated. She was having incoordinate walking, abnormal eye movement and difficulty speaking. Although it was found that the child was having abdominal mass from Ultrasonography, it was not palpable.

- Ultrasonography: Although there was presence of abdominal mass, it was not palpable.
- Biopsy: S/o Extra-adrenal neuroblastoma.

Table 1. Pathology findings.

Investigations	Patient Value	Normal Value	Inference
Hb%	10.6g/dL	11-16g/dL	Decreased
MCV	68.1fL	80-100 fL	Decreased
MCHC	20.8 pg	32-36 pg	Decreased
WBC	14.95 10^3/UL	4-10 10^3/UL	Increased
RBC	5.07 10^6/UL	3.5-5.5 10^6/UL	Normal
Neutrophils	8.6 10^3/UL	2-7 10^3/UL	Increased
Lymphocytes	4.77 10^3/UL	0.8-4.0 10^3/UL	Increased
Monocytes	0.69 10^3/UL	0.12-1.2 10^3/UL	Normal
Eosinophils	1.01 10^3/UL	0.02-0.5 10^3/UL	Increased
Platelets	332 10^3/UL	100-300 10^3/UL	Increased

Management:

Nursing Management:

Nursing care was given to patient as priority.

- Assessed the condition of patient.
- Monitored vital signs and recorded.
- Assessed motor function test frequently.
- Demonstrate ROM exercise.
- Provided comfortable position as patient's preferences.
- Administered medications as prescribed and assess for any reaction.
- Monitored intake and output.

Prognosis: The outcome is determined by the stage, age and several biologic characteristics of the tumour. Patients may also have features of genetic polymorphism that affect the absorption, delivery, metabolism and excretion of drugs.

Follow-Up and Outcomes: Patient responds well to the treatment and her condition was improving. The relatives were informed about the condition of patient and the importance regular taking of medication as prescribed and follow-up care after discharge.

DISCUSSION

A 4 years old, female child was admitted at BJWHC on 7th January, 2020 with a known case of Neuroblastoma for the 2nd dose of Immunoglobulin therapy. She received her chemotherapy treatment (Carboplatin + Etoposide) from Govt. Hospital. Baseline data were collected and investigations were done on admission. Treatment was started and patient shows improvement and response well to the treatment given.

Table 2. Biochemistry findings

Investigations	Patient Value	Normal Value	Inference
ALT/SGPT	18	30-90 U/L	Decreased
AST/SGOT	28	10-34 U/L	Normal
BUN	10 mg%	6-20 mg%	Normal
S. Creatinine	0.3 mg%	0.2-0.9 mg%	Normal
Potassium	3.8 mmol/dL	3.5-5.5mmol/dL	Normal
Sodium	140mmol/L	135-145mmol/L	Normal
Chloride	104 mEq/L	96-106 mEq/L	Normal
Calcium	1.17mmol/L	1-1.3 mmol/L	Normal

Table 3. Medical Management

Drugs	Dose & Frequency	Justification
Inj. Human Normal Immunoglobulin 5%	2gm/Kg IV x OD	It provides passive immunity and can cause lymphadenopathy, althralgia and chest pain.

Studies also promoted a decline in therapy for children with low-risk neuroblastoma disorder and a substantial increase in cure rates for both moderate and high-risk patients. Therapy for patients with high-risk disease involves intensive induction chemotherapy and myeloablative chemotherapy, followed by differentiation therapy and immunotherapy to treat reduced residual disease.

Recent research indicates that the ability of neuroblastomas to undergo spontaneous regression is exceptional. It is difficult to assess the prevalence of this syndrome specifically, but knowledge from mass screening services indicates that there are at least as many children with tumours undergoing spontaneous regression without clinical diagnosis as there are clinically detected patients with neuroblastoma (Garrett M, Brodeur 2018). The prognosis depends on several factors, such as diagnostic age, disease stage, and subtype molecular genetics. About 50% of children who have the disorder are known to have high-risk neuroblastoma. Intensive chemotherapy, surgery, radiotherapy, myeloablative consolidation with autologous haematopoietic stem cell rescue are the standard treatment for children with high-risk neuroblastoma. Unfortunately, no matter the intensity of therapy, more than half of the patients relapse. A better understanding of the underlying immunological processes in anti-GD2 antibody therapy would allow a more reliable assessment of its performance (Szychot E, Pogorzelski JP 2016).

Informed Consent: An informed consent was taken from parents of the patient prior to collection of data. All necessary information was given to relatives and doubts were cleared.

CONCLUSION

Neuroblastoma is a type of cancer occurs in early childhood. It requires early diagnosis and immediate treatment so as to increase the survival rate of children. My patient shows improvement after receiving treatment and follow-up treatment was going on.

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