

# Spectrum of Neurological cases in OPD of Tertiary Paediatric care Center of Nepal

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## Abstract

**Introduction:** Advancement of different mortality of investigation and super specialization of medical science has been able to develop different diagnosis and treatment possible. Neurology is one of the super specialties. Cases are increasing day by day. We aimed to change the data of paediatric neuro OPD.

**Methods:** Those cases that visited the Neuro department of only one governmental tertiary paediatric care center of Nepal and have been registered in outpatient register were analyzed. Mean, frequency etc. were calculated using Microsoft excel.

**Results:** Out of diagnosed 2517 patients, 64.48% (N = 1623) were males, 35.51% (N = 894) were females. The mean age of the children was 57.64. Global developmental delay comprised 24.19% (N = 609), epilepsy comprised 21.81% (N = 549), motor delay comprised 5.68% (N = 143), intellectual delay comprised 1.98% (N = 50), speech delay comprised 3.33% (N = 84), febrile seizure comprised 3.41% (N = 86, 3.41%), seizure disorder comprised 16.84% (N = 424), headache / migraine comprised 3.33% (N = 84), Duchene muscular dystrophy and spinal muscular atrophy comprised 1.5% (N = 38), cerebral palsy comprised 2.41% (N = 61), acute encephalitis syndrome comprised 1.23% (N = 31) and others were 1.03% (N = 26) diagnosis made in the Neuro OPD.

**Conclusions:** Our study showed that there were more male children in Neuro OPD than females and the commonest morbidities included global development delay, hypoxic ischemic encephalopathy, seizure disorder in children visiting the Neuro OPD in tertiary paediatric care center of Nepal.

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## INTRODUCTION

Children are the major bulk of the world's population and 25.65% of the world's population are of 0 to 14 years age group as per the report of World Bank where as 32.35% of Nepalese population are children according to 2011 census.<sup>1</sup> The data will be even larger if we define the child age group below 18 years as the definition of pediatric age group is variable. Neurological problems are the disease of the brain, spinal cord, and peripheral nerves. Globally there is a big burden of neurological problems. It is estimated that over one billion people are affected by neurological problems which is about 6.3% of world population while 12% of global death is due to

neurological causes.<sup>2</sup> In Nepal neurological cases are not reported as other diseases but there is an increasing trend of neurological problems among the children. More and more children are seeking well facilitated neuro centers every day.<sup>3</sup>

In our hospital, being only one tertiary center for child care, most of the children from Nepal is being referred. People from different parts of Nepal are visiting here as super specialty service is very limited. Here, a neuro facility has been provided and a large number of children have been benefited due to the Neuro OPD. There are

numerous etiologies for acquiring neurological disease in children. Few studies showed that birth asphyxia leading to HIE in Nepal increased mortality and morbidity.<sup>4,5</sup> Other causes would be neonatal sepsis, birth asphyxia etc. In our region, there is scarcity of data regarding neurological diseases in children. This is why we have planned to observe the morbidity of paediatric neurological cases. This is expected to reflect on the burden of neurological cases in Nepal. Presentation of the data will be helpful to make concern authority to focus on providing the needful preparation to give better service.

**METHODS**

This retrospective and descriptive study was done by reviewing the data registered in the Neurology Department of our hospital over the duration of two years. Ethical clearance was obtained from the institutional review committee of the hospital (Ref No. 1272). The registered data were encrypted in Microsoft excel sheet. The demographic data (Age, gender, place as well as the caste was also observed) were calculated using excel sheet. The mean age, frequency of male and female children and frequency of diseases were calculated.

**RESULTS**

We collected 2824 data from the register in Neurology OPD. Among them 2517 had visited the hospital for the first time in Neuro OPD and the rest were follow-ups. The mean age of the children visiting the hospital was 57.64 months (IQR 15 days to 14 years). There were 1623 (64.48%) male children and 894 (35.51%) female children. The demographic pattern of the cases has been demonstrated in Table 1.

Table 1 Socio Demography in the Neuro Outpatient Department

Variables	Frequency (%)
Caste according to HIMS	N = 2517
Brahmins and Chhetris	1042 (41.39%)
Janjatis	819 (32.53%)
Madhesi	377 (14.97%)
Dalit	219 (8.70%)
Muslim	49 (1.94%)
Others	11 (0.43%)
Gender	N = 2517
Male	1623 (64.48%)
Female	894 (35.51%)

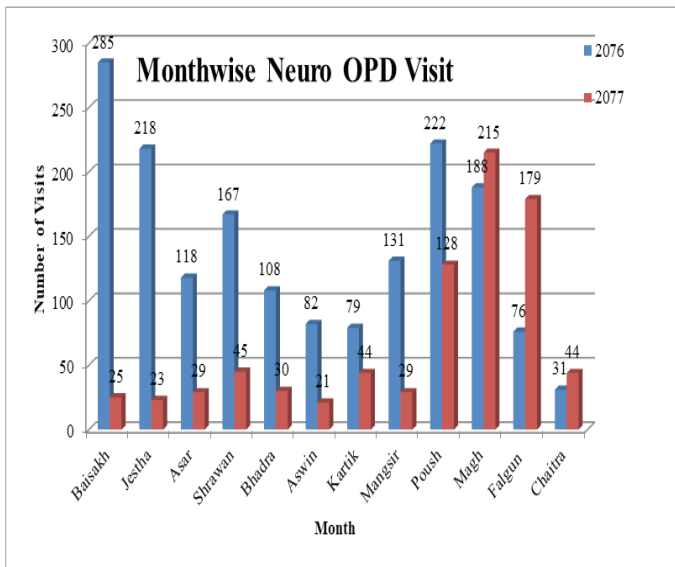
Among the patients who visited the Neuro OPD, 2517 patients had a diagnosis made while 28 had missing diagnoses. Among these diseases, global developmental delay comprised 24.19% (N = 609), epilepsy comprised 21.81% (N = 549), motor delay comprised 5.68% (N = 143), intellectual delay comprised 1.98% (N = 50), speech delay comprised 3.33% (N = 84), febrile seizure comprised 3.41% (N = 86, 3.41%), seizure disorder comprised 16.84% (N = 424), headache / migraine comprised 3.33% (N = 84), Duchene muscular dystrophy and spinal muscular atrophy comprised 1.5% (N = 38), cerebral palsy comprised 2.41% (N = 61), acute encephalitis syndrome comprised 1.23% (N = 31) and others were 1.03% (N = 26) diagnosis made in the Neuro OPD as presented in Table 2.

Table. 2 Spectrum of diagnosis in Neuro OPD

Variables	Frequency (%)
Global developmental delay	609 (24.19%)
Epilepsy	549 (21.81%)
Seizure disorder	424 (16.84%)
HIE sequelae	220 (8.74%)
Motor delay	(5.68%) 143
Febrile seizure	86 (3.41%)
Headache / Migraine	84 (3.33%)
Speech delay	84 (3.33%)
Cerebral palsy	61 (2.42%)
Intellectual delay	50 (1.98%)
DMD and SMA	38 (1.50%)
Acute encephalitis syndrome	31 (1.23%)
Others	26 (1.03%)

Similarly, there were 1079 (42.95%) referrals to other departments for consultations. Among them, Physiotherapy comprised 16.95% (N = 416), Ophthalmology comprised 11.36% (N = 286), ENT comprised 10.8% (N = 272), 84 children were referred to child guidance clinic (3.33%) and 21 children were referred to Orthopedics (0.83%).

Similarly, there was seasonal variation in patient flow in Neuro OPD as shown in Figure 1. There might be difference in the trend as global pandemic Covid 19 had made difficulty in visiting the hospital.



## DISCUSSION

Development of recent modalities and modes of investigational tools have helped in the diagnosis of cases easier. But still neurological diseases are considered as superstitious problems in different parts of our country. This has resulted in people not seeking the medical services due to lack of facility and lack of knowledge. We must have good facilities and better provisions to increase health care more appropriate and reducing the morbidities and mortalities from neuro cases. Timely approach to hospital helps to reach to appropriate diagnosis and treatment modality.<sup>6,7</sup>

In our study we observed that highest morbidity of global development delay which is generally the consequence of perinatal asphyxia. We observed second most morbidity of hypoxic ischemia encephalopathy. Mostly, hypoxic ischemic encephalopathy leads to global developmental delay. Birth asphyxia is a major issue in our country as we are not having fully equipped birthing centers. Still, large number of deliveries being conducted in set up where total set up for neonatal resuscitation is not available. Study done in Southern Nepal had shown that birth asphyxia is a major cause of neonatal mortality.<sup>8</sup> If we can ensure neonatal care and make the delivery room equipped with resuscitation equipment and trained manpower then we can minimize the perinatal asphyxia which finally reduces the burden of global developmental delay.<sup>9</sup>

We observed the second highest prevalent neurological problem in our study was epilepsy. Epilepsy still remains of the most neglected disease in Nepal. People treat epilepsy as social stigma and is generally treated in a traditional way. People prefer to go to traditional “Dhamis” and “Jhakris” rather than taking medicine. They still believe that taking medicine worsens the fate and make them

lifelong disabled. This trend is slowly changing and now more people are visiting hospitals for treatment. Studies done in past have shown the incidence of epilepsy in different hospitals increasing from the past.<sup>10,11</sup> Globally, 65 million people are affected by epilepsy. There is significant increase in incidence of epilepsy in Europe and the treatment cost is even high. Timely diagnosis and treatment will be helpful and beneficial to save quality of life and economic burden.<sup>4,12</sup>

We observed significant number of motor delay and speech delay in our study. Timely diagnosis of such cases will be helpful to increase the quality of life. There are stigmas and thought to be more hereditary incidences of the cases so children used to be managed in traditional ways or not managed at all in the past. Physiotherapy and multidisciplinary approach leads to better prognosis.<sup>13</sup> Similarly those children who are at high risk of developing the developmental delay are to be followed regularly and timely so as to minimize the problems. These children are to be intervened as early as possible in terms of physiotherapy, medical therapy, rehabilitation or others if indicated.<sup>14</sup>

Febrile seizures are frequent in our daily practice. In our study, we found about 3.41% of febrile seizures cases in our Neuro OPD. There is incidence of one febrile seizure in 25 children at least once in childhood.<sup>15,16</sup> This data is less than actual cases that visit our hospital. This might reflect only those cases who have repeated episodes of febrile seizure needing for the referral in Neuro OPD consultation. People become more conscious about febrile seizure as they fear epilepsy in later life.<sup>17</sup> Presently, approach to febrile seizure has been changing. Genetic studies are also being increased as provision of services is becoming easier and more diagnosis are being made.

Seizure disorder is another most common diagnosis in pediatric clinical practice. Seizures are due to infections, birth asphyxia, metabolic causes, febrile convulsions, meningitis, viral encephalitis, neurocysticercosis, cerebral malaria, and epilepsy etc. In our study, we found it in top three morbidities. Similar results are seen in the study done in tertiary care center in Bhairahawa and Pokhara.<sup>18,19</sup>

In our study we observed cases of cerebral palsy as an important cause for Neuro visits. Cerebral palsy is disease of stigma and multiple approaches is needed. Multiple supports are needed and multidisciplinary facilities are required for provision of quality of life.<sup>20</sup> This is associated multiple secondary medical conditions so early intervention and regular follow up with adequate physiotherapy and medication reduces the contracture of the child.<sup>21</sup> Cerebral palsy is not so easy for the care takers to manage. More spastic the cerebral palsy, more is the difficulty in managing the child as well as the quality of

life of the child will live observed in different studies.<sup>22,23</sup>

In our study we observed about 1.5% of the cases were diagnosed as acute encephalitis syndrome. Nepal and some south Asian countries are high risk of Japanese Encephalitis.<sup>24</sup> Japanese Encephalitis and other viral etiologies are increasing the encephalitis cases. Timely approach will reduce the morbidity and mortality as the earlier hospital admission from the onset of fever will reduce the morbidity as shown by the study done by Rayamajhi et al.<sup>25</sup>

Muscular dystrophies are also not so rare in present days. Diagnosing early is troublesome as regular follow up and different investigations are to be done time on timely basis. Genetic testing is needed to diagnose and prevent further morbidity in the family itself. For improving the quality of life to the child, much help us required to the parents.<sup>26</sup> We observed few cases of DMD and SMA in our study and it is important that the stakeholder and concern authority need to think over these not so rare musculoskeletal diseases.

We observed that there were referrals to other departments during management of the cases. This emphasizes the need of multidisciplinary facilities for better care and patient's convenience. Neurological cases would definitely benefit from multispecialty approach and a teamwork management system for increasing the quality of life. This study is a retrospective study and done in a single center so the morbidity of the findings of our research may not be generalized. It is necessary to conduct such research in different hospitals of Nepal.

## CONCLUSIONS

Burden of neurological cases is not less in our country. Global developmental delay, hypoxic ischemic encephalopathy, seizure disorders, epilepsy and cerebral palsy remain the most predominant varieties of neurological cases. Improved neonatal care and birth facilities will help to decrease the preventable morbidity of neurological diseases burden. Neurological cases are increasing and a multidisciplinary approach is needed.

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