

Evaluating the Disease Spectrum and Cost of Care Among Neurology Inpatients in Northeast India: Insights from a Real-World, Hospital-Based Study

Ruby Kasana¹, Haripriya NB¹ Amit Ranjan Baura², Mausumi Barthakur³, Krishna Undela^{1*}

¹Department of Pharmacy Practice, National Institute of Pharmaceutical Education and Research (NIPER) Guwahati, Assam, India

²Department of Neurology and Critical Care, GNRC Institute of Medical Sciences, North Guwahati, Assam, India

³Department of Neurophysiology, GNRC Institute of Medical Sciences, North Guwahati, Assam, India

*Corresponding Author's Email ID: krishna@niperguwahati.in



INTRODUCTION

Neurological Disorders: Unveiling the Hidden Depths

Leading cause of death: 16.5%

2nd leading cause of Disability Adjusted Life Year (DALY): 11.6%

Neurological DALYs: 82.8%

OOP expenditure: 54.2%

Insurance coverage: 2.6%

out-of-pocket (OOP) expense: 70%

Hospital admissions: 1 in 6

Hospitalized patients face financial hardship: 1 in 4

How to address the research gap in neurological inpatient care in low-resource settings?

Clinical Profile
Understands patient demographics and ICD-11 classifications to tailor care

Analyse Economic Burden
Identifies key factors influencing care costs to optimise resource use.

Conduct Cost Analysis
Provides specific cost data to inform resource allocation and policy decisions

METHODOLOGY

Study Design
Ambispective cross-sectional study

Study Site
Department of Neurology & Critical Care., GNRC Hospital, North Guwahati, Assam, India

Study Period
Nine Months

Inclusion Criteria
All patients admitted to the Neurology Ward, regardless of their age and gender

Exclusion Criteria
Not willing to participate
Insufficient data

Statistical Analysis
SPSS version 29

Outcome Measures
International Classification of Diseases 11th Codes
Morse Fall Scale
Braden scale
Numeric pain rating scale
Mini-mental state examination

Study Tool
Demographic and clinical data collected in the Data Collection Form

Data Sources
Medical Record Form
Financial Information
Hospital billing system

RESULTS & DISCUSSION

Total number of Patients Admitted in Neurology Ward (N=498)

Retrospective Record (January 2023 to July 2023) (n=276)

Prospective Record (August 2023 to February 2024) (n=222)

Excluded Patients (n=11)

Eligible Patients Included (N=487)

Flowchart of recruitment for eligible patients

Disease Spectrum and Subgroup Classification of Admitted Patients in the Neurology Ward Based on ICD-11

Diseases Spectrum based on International Classification of Diseases 11th Revision

- Diseases of the nervous system** (n=361 (74%))
 - Cerebrovascular Diseases (n=177)
 - Disorders of Nerve Root (n=85)
 - Epilepsy or Seizures (n=30)
 - Spinal Cord Disorders (n=17)
 - Neuromuscular Junction Diseases (n=13)
 - Movement Disorders (n=11)
 - Certain Disorders of the Nervous System (n=9)
 - Headache Disorders (n=10)
 - Multiple Sclerosis (n=7)
 - Cerebrospinal Fluid Disorders (n=2)
- Diseases of the Ear or Mastoid Process** (n=30 (6%))
 - Diseases of the Inner Ear (n=3)
 - Problems associated with harmful or traumatic events (n=2) (0.4%)
- Diseases of the Visual System** (n=1 (0.2%))
 - Intracranial space-occupying lesion (n=2)
 - Diagnostic imaging of central nervous system (n=1) (0.2%)
- Mental, Behavioural, or Neurodevelopmental Disorders** (n=71 (15%))
 - Anxiety Disorders (n=24)
 - Neurocognitive Disorders (n=18)
 - Substance Use Disorders (n=10)
 - Mood Disorders (n=7)
 - Psychotic Disorders (n=5)
 - Disociative Disorders (n=4)
 - Secondary Mental Syndromes (n=2)
 - Obsessive-Compulsive Disorders (n=1)
- Certain Infectious or Parasitic Diseases** (n=21 (4%))
 - Tuberculosis Meningitis (n=10)
 - Viral Encephalitis (n=8)
 - Neurocysticercosis (n=3)
- Others** (n=16 (3%))
 - Optic neuritis (n=1)

Age group based on disease spectrum

Cost of care based on disease spectrum

Major Disease Category	Median Cost (INR)	Cost Range (INR)
Diseases of the nervous system	28,754.60	1,631.74 – 241,934.91
Mental, behavioural or neurodevelopmental disorders	14,224.14	959.89 – 140,076.37
Diseases of the ear or mastoid process (inner ear/vestibular disorders)	19,200.43	2,733.11 – 44,440.80
Certain infectious or parasitic diseases	32,141.99	0.00 – 153,122.89
Other (ocular motility, imaging findings, etc.)	21,194.88	3,518.15 – 287,623.40

Demographic and clinical Characteristics of all patients based on disease spectrum

Variables	Diseases of the nervous system	Mental, behavioural or neurodevelopmental disorders	Diseases of the ear or mastoid process	Certain infectious or parasitic diseases	Others	P-Value
Age (Year), Mean (SD)	50 (±16)	42 (±2)	50 (±13)	29 (±16)	34 (±21)	<.001*
Gender						
Male	217 (78)	35 (40)	9 (3)	12 (4)	2 (1)	.017*
Female	144 (68)	36 (17)	21 (10)	9 (4)	2 (1)	
Residence						
Rural	321 (74)	66 (15)	25 (6)	21 (5) (0)	4 (1)	.262
Urban	40 (80)	5 (10)	5 (10)	0 (0)	0 (0)	
Employment Status						
Employed	193 (68)	54 (19)	20 (7)	15 (5)	2 (1)	.004*
Unemployed	168 (83)	17 (8)	10 (5)	6 (3)	2 (1)	
Habits-Alcohol						
Present	51 (75)	12 (18)	3 (4)	2 (3)	0 (0)	.753
Absent	310 (74)	59 (14)	27 (6)	19 (5)	4 (1)	
Habits-Smoking						
Present	12 (80)	2 (13)	0 (0)	1 (7)	0 (0)	.850
Absent	349 (74)	69 (15)	30 (6)	20 (4)	4 (1)	
Habits-Tobacco						
Present	198 (80)	26 (11)	18 (7)	5 (2)	1 (0.4)	.003*
Absent	163 (68)	45 (19)	12 (5)	16 (7)	3 (1)	
Comorbidities-Hypertension						
Present	232 (80)	25 (9)	26 (9)	7 (2)	1 (1)	<.001*
Absent	129 (66)	46 (24)	4 (2)	14 (7)	3 (2)	
Comorbidities Diabetes						
Present	143 (82)	16 (9)	10 (6)	3 (2)	2 (1)	.015*
Absent	218 (70)	55 (18)	20 (6)	18 (6)	2 (1)	
Hyperlipemia						
Present	83 (79)	6 (6)	14 (13)	1 (1)	1 (1)	<.001*
Absent	278 (73)	65 (17)	16 (4)	20 (5)	3 (1)	
Discharge Mode						
Routine	201 (76)	38 (14)	18 (7)	8 (3)	1 (0.4)	.147
DOR	146 (74)	25 (13)	11 (6)	12 (6)	3 (2)	
DAMA	14 (58)	8 (33)	1 (4)	1 (4)	0 (0)	
Length of Stay in hospital, Mean (SD)	5 (±3)	4 (±2)	4 (±1)	6 (±3)	4 (±1)	<.001*

#significant at p<0.05

CONCLUSION

- Cerebrovascular diseases, particularly ischemic stroke, were the most common neurological disorders, mainly affecting middle-aged adults.
- Hypertension, diabetes, and hyperlipidemia were frequent comorbidities, often undiagnosed, worsening disease outcomes.
- Direct medical costs (hospitalization and investigations) imposed a major out-of-pocket burden despite partial insurance coverage.
- Findings highlight the need for targeted public health interventions, better comorbidity management, and improved rural healthcare access.

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