The Professional Medical Journal
www.theprofesional.com

DOI: 10.29309/TPMJ/18.4628

ORIGINAL PROF-4628

NEUROLOGICAL PROFILE;

NEUROLOGICAL PROFILE OF PATIENTS RESIDING IN THE RURAL AREAS OF SINDH: DATA FROM A TERTIARY CARE HOSPITAL IN NAWABSHAH

Shaheen Ahmed Mughal[1], Muslim Ali Lakhiar[2], Awais Bashir Larik[3], Abdul Qayoom Memon[4]

1. MBBS, MD
Associate Professor
Department of Neurology
PUMHS, Nawabshah
2. MBBS, FCPS
Assistant Professor
Department of Neurology
LUMHS, Jamshoro
3. MBBS, FCPS
Assistant Professor
Department of Neurology
PUMHS, Nawabshah
4. MBBS, FCPS (General Medicine)
Professor of Medicine
PUMHS, Nawabshah

Correspondence Address:
Dr. Muslim Ali Lakhiar
Assistant Professor
Department of Neurology
LUMHS, Jamshoro.
drmuslimali@yahoo.com

Article received on:
04/01/2018
Accepted for publication:
25/06/2018
Received after proof reading:
06/11/2018

ABSTRACT... Objectives: To determine the Neurological profile of patients residing in the rural areas of Sindh during their visit to a tertiary care hospital in Nawabshah. **Study Design:** Retrospective observational study. **Setting:** Outpatient Department of Neurology at the Peoples University of Medical & Health Sciences for Women (PUMHSW), Nawabshah. **Period:** From 14.4.2014 to 31.3.2015. **Methods:** A questionnaire regarding different Neurological disorders was developed and data about patients presenting in OPD were registered. The data collected was tabulated and analyzed using SPSS 19. **Results:** A total of 861 patients were registered. Out of these 409 (47.5%) were male and 452 (52.5%) were females with male to female ratio of 0.9. The age ranged from 06 months to 90 years and the mean age was 31.57± SD 16.7 7. Out of 861 patients 477 (55.4%) visited neurology OPD on their own, 314 (36.47%) on the advice of their family and friends and only 70(8.13%) were referrals by the general practitioners. Majority of the patients 475 (55.17%) were the residents of villages and small towns while 386 (44.83%) were residing in the city of Nawabshah. The frequency of major category of neurological disorders including Headache, Epilepsies, Stroke, Neuromuscular disorders, Movement disorders, Spinal cord disorders, Dementias, Psychiatric disorders and Miscellaneous group was 33.%, 19.%, 7%, 9%, 4%, 1%, 2%, 16% and 9% respectively. **Conclusion:** Neurological diseases are common among patients residing in the rural areas of Sindh. Headaches, epilepsies, stroke, psychiatric, neuromuscular and miscellaneous disorders were frequent presentations. Lack of adequate referrals by the general physicians needs to be addressed emphatically. This study projects the burden of neurological problems in the under served areas.

Key words: Neurological Disorders, Demography, Rural, Frequency.

Article Citation: Mughal SA, Lakhiar MA, Larik AB, Memon AQ. Neurological profile; neurological profile of patients residing in the rural areas of Sindh: data from a tertiary care hospital in Nawabshah. Professional Med J 2018; 25(11):1723-1729. **DOI:**10.29309/TPMJ/18.4628

INTRODUCTION

Neurological disorders include diseases of the central and peripheral nervous system like the brain, spinal cord, cranial nerves, peripheral nerves, nerve roots, autonomic nervous system, neuromuscular junction and muscles. Neurological diseases are becoming commoner and therefore the burden of these diseases is also increasing. Global statistics shows that 50 million people suffer from epilepsy, 62 million from cerebrovascular disease, 326 million from migraine, and 24 million from Alzheimer disease and other dementias.[1] Furthermore, overall death and disability associated with Neurological diseases is also higher compared to ischemic heart disease, neoplasm, HIV/AIDS, tuberculosis.[2] Major bulk of disability due to neurological diseases is related to stroke, Dementias, Migraine, Epilepsy and tetanus.[1] Developing countries accounts for 85.5% of mortality due to all strokes deaths worldwide.[3]

The annual incidence of major neurological diseases in Pakistan is not yet know. However an estimated stroke incidence is 250/100000 population with a projection of around 350,000 new cases every year.[4] A community based survey reported 21.8% prevalence of stroke and/or TIA in the slum areas of Karachi.[5] Up to 63% of all strokes develop complications and as mush as 89% are left with disability.[6] On the other hand approximately 50 million people are affected with epilepsy around the world.[7] More than 2 million people suffer from epilepsy in Pakistan which

represents about 2% of the population.[8] In the first ever community-based study done in Pakistan the prevalence of epilepsy was 9.99/1000 population.[9] Highest prevalence of epilepsy was seen in people younger than 19 years of age and it is twice common in rural areas than in the urban.[9] Given the burden of neurological diseases in Pakistan a proper nation-wide survey would be an idle way forward.[10] Since the population-based studies are sparsely done in Pakistan, the other alternative sources available for disease-related information come from the hospital-based studies. Although hospital-based studies are not the representative sample of a particular community, they do provide to a certain extent some useful clinical and demographic data. Knowing that the greater proportion of Pakistani population resides in the rural areas, it is important to identify various neurological problems that are prevalent in those areas. The objective of this study was to determine the neurological profile of patients residing in the rural areas of Sindh during their OPD visit at a tertiary care hospital.

METHODS

This was a retrospective observational study conducted at the Outpatient Department (OPD) of Neurology at the Peoples University of Medical & Health Sciences for Women (PUMHSW) Nawabshah over a period of 01 year i.e from 14.4.2014 to 31.3.2015. A questionnaire similar to the one reported by the Aga Khan University study[11] was adopted and the same diagnostic methods were followed for detecting various neurological disorders as per the WHO protocol. Neurological diseases were classified and defined according to the WHO International Classification of Diseases (ICD-10) Codes.[12] Patients were grouped into 1-Headache disorders, 2-Epilepsies, 3-Vascular diseases, 4-Neuromuscular disorders, 5-Movement disorders, 6-Spinal cord disorders, 7-Dementias, 8-Psychiatric disorders and Miscellaneous. The study subjects include all age groups, either sex. After taken verbal consent, demographic and clinical data about each patient presenting in the neurology OPD were recorded. Details including age, sex, place of residence or whether they have come on their own or referred by the physician were noted. Each patient was examined by qualified neurologists. Diagnosis was based on the combination of history, neurological assessment and appropriate investigations. Diagnosis was confirmed with the help of laboratory, radiological (CT-scan, MRI), electrophysiological (NCD, EMG, EEG) tests as and when necessary. Statistical analysis was done by using SPSS version 19.0. Descriptive statistics were calculated for variables like age, sex, residence. Frequencies along with percentages were calculated for categorical variables. (as mentioned above ICD-10 codes added now).

RESULTS

A total of 861 patients were registered through Out Patient Department (OPD) of Neurology at Peoples medical college (PMC) Hospital Nawabshah. Out of these 409 (47.5%) were male and 452 (52.5%) were females with male to female ratio of 0.9 (Figure-1).

The age ranged from 06 months to 90 years and the mean age was 31.57 ±SD 16.77 . Out of 861 patients 477 (55.4%) visited Neurology OPD on their own, 314 (36.47%) on the advice of their family and friends and only 70 (8.13%) were referred by the general practitioners (Figure-2).

Majority 475 (55.17%) were residents of the villages and small towns while 386 (44.83%) were residing in the Nawabshah city. General characteristics including age, gender distribution, referral type, residence are shown in Table-I. The frequency of major categories of neurological disorders including headache, epilepsies, vascular disease (stroke), neuromuscular disease, movement disorders, spinal cord disease, dementia, psychiatric and miscellaneous disorders was 33%, 19%, 7%, 9%, 4%, 1%, 2%, 16% and 9% respectively (Figure-3).

Frequencies and percentages of all types of neurological disorders notably headache disorders (migraine, tension headache), epilepsies (mostly generalized), psychiatric (depression, anxiety, psychosis) neuromuscular (cranial neuropathies, lumbar radiculopathy) and miscellaneous disorders (cerebral palsy, mental

retardation, speech stutter) are shown in Table-II.

	N	%
Total patients enrolled (N)	**861**	
Gender Distribution		
Male	409	47.50
Female	452	52.50
Age		
Minimum	6 month	
Maximum	90 years	
Mean ± SD	31.57 ± 16.77	
Median (Q_1-Q_3)	30 (20-40)	
Referral Type		
Self	477	55.40
Physician	70	8.13
family/friend	314	36.47
Area Type		
Rural Communities	475	55.17
Nawabshah City	386	44.83

Table-I. Basic Characteristics of study population

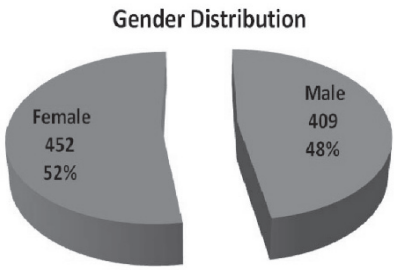

Figure-1. Gender distribution

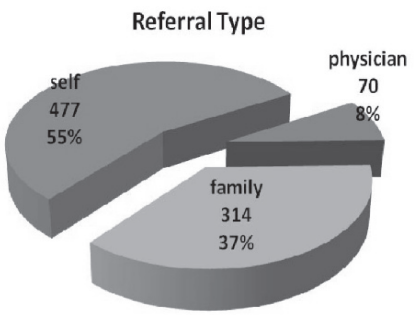

Figure-2. Pattern of referral

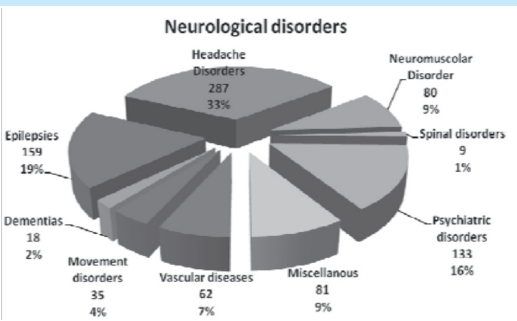

Figure-3. Major categories of neurological disorders

Neurological Disorders	N	%
Vascular Diseases		
Ischemic Stroke	56	6.5
Hemorrhagic Stroke	6	0.6
Movement Disorders		
Parkinson's Disease	11	1.2
Atypical Parkinsonism	1	0.1
Essential Tremor	3	0.3
Chorea	1	0.1
Dystonia	11	1.2
Drug induced Parkinson	1	0.1
Dyslexia	1	0.1
Oro fascial dyskinesia	1	0.1
Titubation	1	0.1
Hemifascial spasm	4	0.4
Dementias		
Alzheimer's disease	13	1.5
Vascular dementia	5	0.5
Epilepsies		
Partial Epilepsy	31	3.6
Generalized Epilepsy	122	14.1
Juvenile myoclonic epilepsy	5	0.5
Febrile seizures	1	0.1
Headache Disorders		
Migraine	160	18.5
Tension type headache	97	11.2
Cluster headache and other trigeminal autonomic cephalalgias	6	0.6
Headache attributed to head and/ or neck trauma	3	o.3
Headache due to cranial or cervical vascular disorder	11	1.2
Headache due to infection	2	0.2
Headache due to craniofacial structures e.g ENT, eyes, teeth	4	0.4
Headache due to psychiatric disorder	1	0.1
Cranial Neuralgias and central causes of facial pain	2	0.2
Mixed HA	1	0.1
Neuromuscular Disorders		
Cranial neuropathies	18	2.0
Inherited peripheral neuropathies	3	0.3
CIDP	2	0.2
Diabetic polyneuropathy	4	0.4
Carpal tunnel syndrome	3	0.3
Radial nerve neuropathy	1	0.1
Plexopathy	1	0.1
Cervical radiculopathy	5	0.5
Lumber radiculopathy	33	3.8
Congenital myopathy	1	0.1

Muscular dystrophies	2	0.2
Musculoskeletal pain	3	0.3
Lumbar Paraspinal spasm	1	0.1
Cervical spasm	1	0.1
Anterior Horn Cell Disorder	1	0.1
Motor neuron disease	1	0.1
Spinal Cord Disorders		
Myelopathy (Spinal Cord disease)	8	0.9
Myelitis (transverse)	1	0.1
Psychiatric Disorders		
Depression	55	6.3
Bipolar disorder	2	0.2
Anxiety neurosis	35	4.0
Obsessive compulsive disorders	2	0.2
Psychosis and Schizophrenia	27	3.1
Conversion disorder	12	1.3
Miscellaneous		
Cerebral palsy	13	1.5
Frozen Shoulder	2	0.2
Orbital Cellulitis	1	0.1
Mental Retardation	3	0.3
Speech stutter	5	0.5
Post encephalitic sequel	2	0.2
Hyperactivity Disorder	4	0.4
Narcolepsy	2	0.2
Down syndrome	1	0.1
Septic Encephalopathy	1	0.1
Microcephaly	2	0.2
Hypoxia-hypotensive encephalopathy	1	0.1
Hepatic encephalopathy	1	0.1
Tinnitus	2	0.2
Vertigo (BPPV, Vestibular neuronitis)	36	4.1
Viral encephalitis	1	0.1
Tuberculous meningitis	4	0.4

Table-II. Frequency and percentage distribution of patients against all catagories of neurological disorders
(Note diagnosis criteria mentioned in methods by ICD-10)

DISCUSSION

We have identified different neurological disorders which were prevalent among the patients belonging to the rural areas of Sindh. The most common were headache, epilepsy, stroke, psychiatric, neuromuscular and other miscellaneous disorders. In a literature review we could not find a local study that has specifically highlighted a neurological profile of patients hailing from the rural areas. We could find three local hospital-based studies covering the same topic of interest from the urban centers only. In one such study by Alam et al,[13] from the city of Peshawar the frequency of headache, stroke, epilepsy, psychiatric and other miscellaneous disorders was 24%, 22% , 17%, 8%, 7% with a mean of age of 46 years. In the other from Faisalabad Marie et al,[14] reported epilepsy (16.6%), headache (15%), Depression (19.6%), paralysis (8.5%) and miscellaneous conditions (6.2%) among their patients recruited from various tertiary care medical centers. Another study from the Aga Khan University (AKU) Hospital Karachi Awan et al,[11] reported headache disorders in 18.6%, vascular diseases in 17.4%, nerve and root lesions in 14.1% and epilepsies in 12.5% with a mean age of 46.2 years. While the above quoted studies[11,13,14] have underscored the burden of neurological diseases notably from the urban areas of our country, the rural outlook is hitherto missing. Since we could not find a study from a rural set up from Pakistan, we searched for relevant studies done in countries having a predominant rural background as well as limited access to medical facilities comparable to that of ours. In a hospital based study from Cameron, Tequeu et al,[15] reported headache (31.9%), epilepsy (9.8%), stroke (3%), depression (4%) and polyneuropathy (4%) as the top ten leading diseases with almost equal gender distribution and a mean age of 44.8 years. In a cross-sectional study covering both urban and rural Ugandan population, Kaddmukasa et al,[16] reported peripheral neuropathy (45.2%), headache (26.4%), epilepsy (8.5%), and stroke (6.6%) as leading neurological disorders with a median age of 33 years and a female preponderance. In another hospital–based study from rural Tanzania the most frequent neurological diseases were seizures (26.6%), infectious diseases (18%) stroke (10%) and polyneuropathy (31%) with a mean age of 26 years and a female to male ratio of 1:3.[17] The greater frequency of polyneuropathy (45% & 31%) in the these two studies[16,17] compared to that of ours (9%) is quite striking. However reported wide differences in the prevalence of various neurological disorders are not uncommon. Higher prevalence of headache was reported from Zambia (72%)[18] and lower from Ethopia

(21%)[19] and Tanzania (23%).[20] Similarly, lower figures for epilepsy (3.4%) and higher for stroke [61%) in a Nigerian study.[21] Such differences are universal and largely attributable to the different methodologies used as well as differences in the cultural and population characteristics of the patients.[16] In addition, considerable variations in the prevalence of neurological disorders can be seen within the same country [22] and for stroke in particular variations can be seen across the several Asian countries.[23] Furthermore, countries where rural population is quite dominant and larger than that of ours like India the neurological disorders may be twice as common in rural areas than in the urban areas.[22,24] Such higher prevalence of neurological diseases in the rural areas causes enormous socioeconomic burden for the patients and their families.[17] The same situation holds true for the rural Sindh where majority of the people work on daily wages, many are involved in farming or in a small scale business. A proper health planning for providing low-cost and easy accessible neurological care in the rural areas is therefore desperately needed.

It is noteworthy that the increasing numbers of patients with psychiatric disorders are being presented in the neurology OPD. In our study 16% had psychiatric problems including anxiety and depression which is double than 8% reported by Alam et al,[13] and lower than 19% reported by Marie et al,[14] Certainly, it leads to an added load of patients to be taken care of in the neurology OPDs. The same happens even in those teaching hospitals where neurology and psychiatry OPDs are working separately. This is a clear indication of general public's lack of awareness regarding various specialties (neurology, psychiatry, neurosurgery) dealing with the diseases of the brain. In most part, people in the rural areas tend to perceive the doctors working in the brain-related specialties arbitrarily as the" demagh ka doctor". That could be a likely reason why considerable number of patients with psychiatric disorders visit neurology OPDs and vice versa since the distinctions between the specialties is lacking. Knowing that the anxiety and depression are common in the rural areas of Sindh[25] it is not surprising to see a greater frequency (16%) of these disorders in our rural set-up.

The other crucial aspect that needs to be highlighted here is the lack of adequate referrals by the general practitioners. The fact that previous studies too have pointed out.[13,15] In our study only 8% of cases were referred by the general physician whereas majority (55%) came on their own and 36% on the advice of their family and friends. The referrals were comparatively much better in the study by Tequeu et al,[15] where 38% were referred by the specialized doctors and 35% by the general practitioners and only 14% came alone. This prompts us to emphasize that our referral system needs an urgent redressel of this neglected issue. Needless to say, the delay in referring the patients would lead to a delay in the diagnosis and the subsequent treatment which would eventually give rise to all kinds of complications. Some may end up visiting the quacks working in their respective areas leading to fatal consequences. It is therefore imperative that the general physicians working in the remote rural areas take the initiative in identifying the neurological disorders and making immediate referrals to a nearest neurology facility whenever necessary. In doing so the GP-Neurologist interaction would enhance further and the only beneficiary will be the patients at large.

It is pertinent to add that our study is a hospital-based study mainly focusing on patients attending the neurology OPD only. The numerical figures would have been different had the patients with neurological problems attending other specialty OPDs like psychiatry and neurosurgery were also included. Given the increasing burden of neurological disorders in our rural as well as in the urban regions, we endorsed the views by Wasay et al[10] that a nation-wide survey of neurological disorders is needed and that should include participation of all major neurological centers across the country. In the same context, it is worth noting that in more recent AKU study[11] projected the urban arm of our population, this study highlights the rural arm. Looking at both arms of the population makes it more reasonable and scientifically valid.

CONCLUSION

Our study indicates that the Neurological diseases are common among the patients residing in the rural areas of Sindh. Headaches, epilepsies, stroke, psychiatric, neuromuscular and miscellaneous disorders were frequent presentations. Lack of adequate referrals by the general practitioners need to be addressed emphatically. This study projects the burden of neurological problems in the underserved areas.

REFERENCES

1. Neurological disorders: Public health challenges, Geneva, Switzerland: WHO 2006 PP 27-35.
2. World Health Organization. **Mortality estimates by cause, age and sex for the year 2008.** WHO; 2008.
3. Feigin VL, Forouzanfar MH, Krishnamurthi R, et al. **Global and regional burden of stroke during 1990-2010: findings from the Global Burden of Disease Study 2010.** Lancet 2014; 383:245-55.
4. Khealani BA, Wasay M. The burden of stroke in Pakistan. Int J Stroke 2008; 3:293-6.
5. Kamal AK, Itrat A, Murtaza M, Khan M, Rasheed A, Ali A, et al. **The burden of stroke and transient ischemic attack in Pakistan: A community-based prevalence study.** BMC Neurol 2009; 9:58.
6. Farooq MU, Majid A, Reeves MJ, Birbeck GL. **The epidemiology of stroke in Pakistan: Past, present and future.** Int J Stroke 2009; 4:381-9.
7. Katchanov J, Berbeck GL. **Epilepsy care guidelines for low and middle income countries.** BMC Medicine 2012 ;10:107.
8. Khatri IA, Abdullah M, Iyas S, et al. **Epidemiology of epilepsy in Pakistan.** A review of literature. JPMA 2003; 53:594.
9. Aziz H, Ali SM, Frances P, et al. **Epilepsy in Pakistan: A population-based epidemiologic study.** Epilepsia 1994; 35(5):950-8.
10. Wasay M, Ali S. **Growing burden of neurological diseases in Pakistan: Need for a national health survey.** JPMA 210; 60(3):249-50.
11. Awan S, Shafqat S, Kamal AK, et al. **Pattern of neurological diseases in adult outpatient neurology clinics in tertiary care hospital.** BMC Res Notes 2017; 10:545.
12. WHO. **International statistical classification of diseases and related health problems, 10th Revision.** Geneva: WHO; 2010. II.ICD-10.
13. Alam SM, Khan H, Wahid K. **Spectrum of neurological disorders presenting at a neurology clinic in tertiary care hospital in Peshawer, Pakistan.** Pak J Neurol Sci 2015; 10(4):23-6.
14. Marie A, Dumril C, Bouquet M et al. **Neurological disorder burden in Faisalabad, Punjab, Pakistan: Data from the major tertiary care centers of the city.** Int J Pub H Epidem 2017; 6(5):363-72.
15. Tequeu CK, Nguefack J, Doumbe J, et al. **The spectrum of neurological disorders presenting at a neurology clinic in Yaounde, Cameroon.** Pan Afr Med J 2013; 14:148.
16. Kaddumukasa M, Mugenyi L, Kaddumukasa MN et al. **Prevalence and incidence of neurological disorders among adult Ugandans in rural and urban Mukono district; a cross sectional study.** BMC Neurology 2016(16):227.
17. Winkler AS, Mosser P, Matuja WB, Schmutzhard E. **Neurological disorders in rural Africa: A systemic approach.** African Journal of Neurological Sciences 2008; 27(2):19-29.
18. Mbewe E, Zairemthiama P, Yeh HH et al. **The epidemiology of primary headache disorders in Zambia: A population-based door-to-door study.** J Headache Pain 2015; 16:515.
19. MengistuG, Alemaqyehu S. **Prevalence and burden of primary headache disorders among a local community in Addis Ababa, Ethiopia.** J Headache Pain 2013; 14:30.
20. Dent W, Spiss H, Helbok R, et al. **Prevalence of migraine in a rural area in South Tanzania: a door-to-door survey**. Cephalgia 2004; 24(1):960-6.
21. Chappo-Jumbo E. **Neurologic admissions in the Niger delta area of Nigeria: A ten year review.** African Journal of Neurological Sciences 2004; 23(1):14-20.
22. Gourie-Devi M. **Epidemiology of neurological disorders in India: review of background, prevalence and incidence of epilepsy, stroke, Parkinson's disease and tremors.** Neurol India 2014; 62(3):588-98.
23. Mehndiratta MM, Khan M, Mehndiratta P, Wasay M. **Stroke in Asia: Geographical variations and temporal trends.** BMJ 2014; 85(12):1308-12.
24. Gourie-Devi M, Gururaj G, Satishchandra P, Subbakrishna DK. **Prevalence of neurological disorders in Bangalor, India: A community-based**

study with comparison between urban and rural areas. Neuroepidemiology 2004; 23(3):261-68.

25. Luni FK, Ansari B, Jawad A, et al. **Prevalence of depression and anxiety in a village in Sindh.** J Ayub Med Coll Abbotabad 2009; 21(112):68-78.

Real girls are never perfect and perfect girls are never real.

– Unknown –

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Shaheen Ahmed Mughal	Data collection, Data analysis, Manuscript writing, Manuscript review.	
2	Muslim Ali Lakhiar	Study concept & design, Data collection, Manuscript writing.	
3	Awais Bashir Larik	Data collection, Data analysis manuscript writing, Review.	
4	Abdul Qayoom Memon	Data collection, Manuscript writing, Manuscript review.	