

ORIGINAL ARTICLE

Neurological Emergencies in HIV Infected Individuals at a Tertiary Hospital

Sundarachary Nagarjunakonda¹, Sridhar Amalakanti^{2*}, Snigdha Gollapudi³

Abstract

Objectives: To describe the Neurological emergencies in HIV infected patients presenting to a tertiary hospital.

Methods: From 1st May 2016 to 31st July 2016, in a tertiary hospital in South India we studied the clinical profile of 60 HIV seropositive patients with neurological emergencies in a cross sectional observational design.

Results: Young (38±10 years), illiterate (48.8%) men (75%) formed the majority of the patients. The main presentations were fever (45%), weakness of limbs (43.3%) and headache (43.3%). TB meningitis (51.9%) was the most common diagnosis.

Conclusions: Neurological emergencies in HIV infected patients have a distinct profile with infections being the most common causes.

Introduction

Neurological disorders are associated with significant mortality and morbidity. They are estimated to cause 5.7 million deaths every year.¹ Emergencies in neurology are a subset among these disorders that present with serious deficits in the patients. These need immediate attention and appropriate treatment. Delay in management results in longstanding sequelae due to the poor regenerative capacity of the neurons.² Prompt institution of treatment requires a thorough knowledge of these common conditions associated with neurological acute illnesses. Many comprehensive reports and books on neurological emergencies³ have been produced to meet this need. In all studies of emergency neurological consultations, stroke, headache disorders, seizures, and dizziness make up a large majority of the patients.⁴ Neurological emergencies in HIV patients are however a different cup of tea.

Certain characteristics of the HIV seropositive patients result in unique presentations and etiologies of neurological emergencies. For one, the weakened immune system predisposes these individuals to opportunistic and highly virulent infections.

Secondly, many chronic diseases and non-communicable diseases are also common in these patients.^{5,6} These individuals are particularly affected by auto-immune diseases⁷ and severe,⁸ flagrant manifestations of almost all pathogenic organisms. In Toto, these people thus develop a different profile of neurological emergencies. Considering that there are 36.7 million HIV patients in the world⁹ and India being host to the third highest number of HIV infected people, there is a dire need to study the characteristics of neurological emergencies in HIV patients. Only by characterizing the profile of the presentations in HIV patients can informed, in time clinical decisions made and life-saving algorithms practices can be formulated.

Methods

In a cross sectional observational design at the Government General Hospital, Guntur from 1st May 2016 to 31st July 2016, we studied 60 adult (>14 years) HIV positive patients who were diagnosed with neurological emergencies.³ These disorders included conditions with critical neurological illness in HIV seropositive patients.

Categorization of education and occupation were done by Kuppuswamy¹¹ socio economic classification. Cities

with population > 3 lakhs, like Guntur and Vijayawada were considered as urban.

Written informed consent was obtained from the relatives of the patients. The demographic and clinical characteristics of the patients were obtained; appropriate investigations were done as per clinician's decision. CT scan and MRI scan of the brain were performed when indicated. The study was approved by the Institutional Ethical Committee at Guntur Medical College, Guntur (GMC/IEC/021/2016).

Statistics

The data was tabulated in MS Excel 2007. It was analyzed with IBM SPSS version 21. For parametric quantitative data the results are depicted as mean and standard deviation, comparisons were made with student independent T test between two categories and one way ANOVA for comparison of quantitative variables between more than two categories. Proportions are also depicted for categorical data.

Results

The mean age of the 60 HIV patients with neurological emergencies studied herein was 38±10 years. Twenty five percent of the patients were females. Majority (48.8%) of the patients were illiterate. Most (40%) of our study population were semi-skilled workers. Both urban (49%) and rural (51%) populations were equally represented. Hindus (64.1%) formed the majority (Table 1).

Fever (45%), weakness of limbs (43.3%) and headache (43.3%) were the most common presentations in these patients (Table 2). Tuberculous

¹HOD, ²Resident, Dept of Neurology, ³Undergraduate, Guntur Medical College, Guntur, Andhra Pradesh; ^{*}Corresponding Author
Received: 06.05.2017; Accepted: 25.07.2018

Table 1: Demographic data of the patients

Characteristic	N=60
Mean age ± SD	38 ± 10
Female%	25%
Education	%
Illiterate	48.8
Primary school certificate	12.2
Middle school certificate	14.6
High school certificate	17.1
Intermediate	4.9
Graduate/Post graduate	2.4
Occupation	%
Unemployed	10
Unskilled	1.7
Semi-skilled	40
Clerical, shop owner, farmer	11.7
Profession	5
Residence	%
Rural	51
Urban	49
Religion	%
Hindu	64.1
Christian	33.3
Muslim	2.6

Table 2: Clinical features

Symptoms and Signs	Percentage
Fever	45
Weakness of limbs	43.3
Headache	43.3
Altered sensorium	38.3
Vomitings	33.3
Seizures	18.3
Loss of appetite	15
Paresthesias	10
Blurring of vision	10
Loss of consciousness	10
Bowel and bladder incontinence	10
Speech disturbances	6.7
Difficulty in swallowing	1.7

meningitis (TBM) was the most common disease diagnosed in the patients (Table 3). Out of the 60 subjects, 2 patients died. They were diagnosed with meningitis of unknown etiology. Neuroimaging was normal in 39.6% of the cases (Table 4).

Discussion

Our study characterized the clinical and demographic features of HIV patients presenting with neurological emergencies at a tertiary hospital.

Certain features emerged in our study. Most of the patients were young individuals. As youth encompass the majority of HIV seropositive individuals,¹² this result ought to be expected. As to why HIV is reported in high proportion of young people may be multifactorial. This might be either due to the early deaths due to the

Table 3: Etiological profile

Diagnosis	Percentage
TBM	51.9
GBS/AIDP	11.1
Acute ischemic stroke	11.1
Meningitis	11.1
Toxoplasmosis	5.6
Cryptococcal meningitis	1.9
Viral meningitis	1.9
Meningoencephalopathy	1.9
Cryptococcal and tuberculous meningitis	1.9
Hodgkin's lymphoma	1.9

Table 4: Neuro-imaging

Imaging	Percentage
Normal study	39.6
Infarct	17
SOL	13.2
Hypodensity+ infarct	11.3
Hypodensity	7.5
Edema	5.7
Hypo density+ edema	1.9
Hypo density+ edema+ SOL	1.9
Gliososis	1.9

disease or due to high risk behaviour in younger individuals.

High risk behaviour is more common in men than women¹³ as such in this study men were the higher proportion. This disparity in gender may be a reflection of the overall HIV positive gender ratio on one side¹⁴ and also the generally low case reporting in women noted in many studies especially in developing and under developed countries.¹⁵

Resource limited countries have low literacy rates. Low literacy is associated with high prevalence of HIV and low awareness of treatment and self.¹⁶ Correspondingly, in this study majority (48%) of the subjects were illiterate.

In India, literacy is influenced by the religious affiliation. The 2001 Indian population census showed that the literacy rates of Hindus, Muslims and Christians was 65.1%, 59.1% and 80.3% respectively.¹⁷ The lower proportion of Christians in our study may be due to their higher literacy. The effect of lower literacy in Muslims may be masked by their ritual circumcision which has been noted to be protective against HIV transmission.¹⁸ It may also simply be due to the large proportion of Hindus in the locality¹⁹ which reflected in our study of neurological emergencies.

In large studies the most common neurological emergencies noted in HIV negative individuals are stroke,

unconsciousness, seizures and headache.²⁰ But our study shows a high proportion of infectious causes; more than half of the patients were ultimately diagnosed with TBM, followed by AIDP and stroke. Given the high prevalence of TB in our region²¹ and the immunosuppression in HIV infected individuals this finding is expected. A French study in 1995 on HIV patients showed that opportunistic infections are the most frequently observed emergencies and tuberculosis was a major concern in these individuals.²² HIV by name causes immunodeficiency; hence infections are more common causes of diseases in the patients. In developed countries, the profile of the HIV infected patient in the emergency department has changed from opportunistic infections to ART related adverse events and the diseases associated with aging and chronic disease.²³ However, in resource limited countries HIV patients are still exposed to the risk of serious complications and most of the emergencies are due to opportunistic infections.²⁴

Infectious meningitis, a serious affliction of brain in HIV patients is the most common emergency in this study. Hence its characteristic features fever, headache predominate the symptomology. Another symptom with which many patients presented was weakness of limbs. This is a manifestation of neuronal deficit in both TBM and AIDP, the top two diseases in our series.

TB, fever of unknown origin and respiratory tract infections have been noted to be common causes of deaths in HIV patients in large scale studies.²⁵ The two deaths noted in our series were due to infectious meningitis. This reiterates that overwhelming infections are the important cause of death in HIV patients with neurological disease. The fact that the etiology remained undiagnosed also shows the propensity for atypical infections in these patients. Meningeal involvement is also common in HIV patients in regions with high prevalence of TB.²⁶

In the 56 cases studied, neuroimaging was normal in 39.6% of the cases. Infarcts, hypo densities and ICSOL, typical findings in CNS infections²⁷ especially TB meningitis in HIV patients were the other lesions noted.

The clinical profile of neurological

emergencies in HIV patients shows a predominance of young illiterate males with signs and symptoms of meningitis and focal neurological deficits. The chief etiology is TBM. The study thus suggests that the physicians should consider in this possibility early in emergency and investigate accordingly.

Acknowledgements

The study was performed as part of the ICMR STS 2016 program. All personnel contributing significantly to the work have been acknowledged.

References

- Mathers C, Fat DM, Boerma JT. The global burden of disease: 2004 update (Internet). World Health Organization; 2008 (cited 2016 Sep 27). Available from: https://books.google.co.in/books?hl=en&lr=&id=xrYYZ6Jcfv0C&oi=fnd&pg=PR5&dq=global+burden+of+disease+update&ots=taYAYia1wl&sig=Xfk0YzJYEu5XxZO_gmBysaN4V8l
- Saddichha S, Saxena MK, Vibha P, Methuku M. Neurological emergencies in India--lessons learnt and strategies to improve outcomes. *Neuroepidemiology* 2009; 33:280-5.
- Singh MB. Emergencies in Neurology. Byword Books Private Limited; 2011. 449 p.
- Pope JV, Edlow JA. Avoiding Misdiagnosis in Patients with Neurological Emergencies. *Emerg Med Int* (Internet). 2012 (cited 2016 Sep 27);2012. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3410308/>
- Liver Disease, Cirrhosis and HIV - HIV/AIDS (Internet). (cited 2016 Aug 31). Available from: <http://www.hiv.va.gov/provider/manual-primary-care/liver-disease.asp>
- Venkat Narayan KM, Miotti PG, Anand NP, Kline LM, Harmston C, Gulakowski R, et al. HIV and Noncommunicable Disease Comorbidities in the Era of Antiretroviral Therapy: A Vital Agenda for Research in Low- and Middle-Income Country Settings. *JAIDS J Acquir Immune Defic Syndr* 2014; 67:52-7.
- Zandman-Goddard G, Shoenfeld Y. HIV and autoimmunity. *Autoimmun Rev* 2002; 1:329-337.
- Wall EC, Cartwright K, Scarborough M, Ajdukiewicz KM, Goodson P, Mwambene J, et al. High mortality amongst adolescents and adults with bacterial meningitis in sub-Saharan Africa: an analysis of 715 cases from Malawi. *PLoS One* 2013; 8:e69783.
- WHO | Global AIDS Update (Internet). WHO. (cited 2016 Jul 23). Available from: <http://www.who.int/hiv/pub/arv/global-aids-update-2016-pub/en/>
- Lister TP. Neurological emergencies. *Br Med J Clin Res Ed* 1981; 283:473-5.
- Kumar N, Shekhar C, Kumar P, Kundu AS. Kuppaswamy's socioeconomic status scale-updating for 2007. *Indian J Pediatr* 2007; 74:1131.
- Statistics Overview | Statistics Center | HIV/AIDS | CDC (Internet). (cited 2016 Sep 27). Available from: <http://www.cdc.gov/hiv/statistics/overview/>
- Dandona L, Dandona R, Kumar GA, Reddy GB, Ameer MA, Ahmed GM, et al. Risk factors associated with HIV in a population-based study in Andhra Pradesh state of India. *Int J Epidemiol* 2008; 37:1274-86.
- State Fact Sheets | NACO (Internet). (cited 2016 Sep 27). Available from: <http://naco.gov.in/state-fact-sheets>
- Gender Differences in Health Care-Seeking Behavior for Sexua... : Sexually Transmitted Diseases (Internet). LWW. (cited 2016 Sep 27). Available from: http://journals.lww.com/stdjournal/Fulltext/2004/05000/Gender_Differences_in_Health_Care_Seeking_Behavior.2.aspx
- Wolf MS, Davis TC, Osborn CY, Skripkauskas S, Bennett CL, Makoul G. Literacy, self-efficacy, and HIV medication adherence. *Patient Educ Couns* 2007; 65:253-60.
- Kaur G, Kaur D. Literacy of major religious groups in India: A geographical perspective. (cited 2016 Sep 29); Available from: http://sikhinstitute.org/oct_2012/5-divjot.pdf
- Talukdar A, Khandokar MR, Bandopadhyay SK, Detels R. Risk of HIV infection but not other sexually transmitted diseases is lower among homeless Muslim men in Kolkata. *AIDS* 2007; 21:2231-2235.
- Census Reference Tables, C-Series Population by religious communities (Internet). (cited 2016 Sep 27). Available from: http://www.censusindia.gov.in/Census_Data_2001/Census_data_finder/C_Series/Population_by_religious_communities.htm
- Figuerola A, Vivancas J, Manforte C, et al. (Record of neurological emergencies at a tertiary care hospital). *Rev Neurol* 1998; 27:750-4.
- TB Statistics for India | National and state statistics (Internet). TB Facts.org. (cited 2016 Aug 29). Available from: <http://www.tbfacts.org/tb-statistics-india/>
- Lowenstein W. (Emergencies in human immunodeficiency virus infection). *Rev Prat* 1995; 45:722-7.
- Gutteridge DL, Egan DJ. The HIV-Infected Adult Patient In The Emergency Department, The Changing Landscape Of Disease. *Emerg Med Pract* 2016; 18:1-16.
- Tanon A, Eholié S, Binan Y, Ehui E, Zana E, Maurice C, et al. [Medical emergencies related to HIV/AIDS in tropical zones: a prospective study in Cote d'Ivoire (1999-2000)]. *Médecine Trop Rev Corps Santé Colon* 2006; 66:162-6.
- Jha P, Kumar R, Khera A, Bhattacharya M, Arora P, Gajalakshmi V, et al. HIV mortality and infection in India: estimates from nationally representative mortality survey of 1.1 million homes. *BMJ* 2010; 340:c621.
- Jarvis JN, Meintjes G, Williams A, Brown Y, Crede T, Harrison TS. Adult meningitis in a setting of high HIV and TB prevalence: findings from 4961 suspected cases. *BMC Infect Dis* 2010; 10:67.
- Offiah CE, Turnbull IW. The imaging appearances of intracranial CNS infections in adult HIV and AIDS patients. *Clin Radiol* 2006; 61:393-401.