Pattern of Medical Admissions at Enugu State University of Science and Technology Teaching Hospital: A 5 Year Review

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Abstract

Background: Rapid urbanization and changing lifestyle have modified the profile and pattern of various medical disorders in many Nigerian communities. Surveys of medical admissions into various Nigerian health institutions show an increasing burden of non-communicable diseases in our communities. Aim: To determine the profile and pattern of medical cases admitted and their outcome in a new tertiary medical institution in South East Nigeria. Materials and Methods: A review of medical admissions into the Enugu State University of Science and Technology Teaching Hospital (ESUTTH), Enugu, Nigeria over 5 years between January 1, 2006 and December 30, 2010 was undertaken. Morbidity and mortality data were obtained from ward registers and subsequently medical record registers. Classifications of medical disorders were grouped using ICD 10 coding system. Results: A total of 3,865 case records were analyzed. Males were 2,312/3,865 (59.6%) and females 1,660/3,865 (40.2%). The age range was 14-105 years with a mean age of 54.3 (18.1) years. The 4 commonest causes of medical ward admissions were neurological disorders‑850/3,865 (22%), endocrine disorders‑735/3,865 (19.1%), cardiovascular disorders‑718/3,865 (18.5%) and infectious diseases‑604/3,865 (15.6%). The diseases encountered most were diabetes mellitus‑735/3,865 (19.1%), hypertension/congestive cardiac failure‑703/3,865 (18.2%), strokes‑614/3,865 (15.9%) and human immunodeficiency virus (HIV)/AIDS‑503 (13.1%). The overall mortality was 766/3,865 (19.8%) men‑467/2,312 (20.2%); women‑299/2,312 (19.3%). Strokes accounted for most of the deaths‑171/766 (22.3%) followed by HIV/AIDS 127/766 (16.6%). Hypertension/cardiac failure and diabetes each accounted for 116/766 (15.1%) of all deaths. Case fatality rates for strokes and HIV/AIDS were the highest (171/614 (27.9%) and 127/503 (25.2%) respectively). Mortality rate was highest in the above 70 years age group. Conclusion: Non-communicable disorders are the commonest causes of medical ward admission in this tertiary institution. Efforts aimed at primary prevention will help to reduce the burden of these disorders in the community.

Keywords: Cardiovascular disorders, Human immunodeficiency virus, Medical ward admissions, Neurological disorders, Nigeria

Introduction

Rapid urbanization and changing lifestyle have modified the profile and pattern of various medical disorders in many Nigerian communities. The theory of epidemiological transition[1] stresses the complex change in patterns of health and disease and on the interactions between these patterns and their demographic, economic and sociologic determinants and consequences. Surveys of medical admissions into various Nigerian health institutions indicate the rising burden of non-communicable
diseases in our communities. The rising prevalence of non-communicable diseases and the emergence of Human immunodeficiency virus (HIV) support the above theory (HIV may be regarded as man-made disease due to breakdown in social norms because of increasing urbanization and westernization of the Nigerian communities). This study aims to determine the profile and pattern of medical cases admitted and their mortality at the Enugu State University of Science and Technology Teaching Hospital in South East Nigeria.

**Materials and Methods**

**Setting**

The study was carried out in the medical wards of the Enugu State University of Science and Technology Teaching Hospital (ESUTTH), Enugu, Nigeria. The hospital was upgraded to a teaching hospital in 2005, and it is the second largest health care facility in Enugu which is the capital of Enugu state. At inception the hospital had a 36-bed capacity dedicated to medical cases. However at present, the bed capacity for medical admissions is 50. Medical patients in the ESUTTH are routinely admitted into any of the female and male medical wards and come from more than 5 states of the federation. In addition, medical patients may be admitted into surgical and gynecological wards when there are insufficient bed spaces in the regular medical wards.

We undertook a 5-year review of medical admissions into the ESUTTH Enugu, Nigeria between January 1, 2006 and December 30, 2010. Morbidity data was obtained from the respective ward registers and, subsequently, medical record registers. Mortality data were also obtained from the same sources, as well as from the ward copies of death certificates. The sampling approach was to review all (100%) admissions and mortalities within the period under review. These admissions were evaluated retrospectively for patients’ demographic details, duration of admission, diagnoses and outcome. In case of death, the cause(s) of death were obtained for all cases and data included date and cause of death. Only cases admitted into the three medical wards were included. In cases of incomplete data or conflicting diagnoses such patients were excluded. For ease of classification, medical diagnoses were grouped using ICD 10 coding system. ICD 10 coding was done by trained medical record officers of the medical records department of the hospital. Primary and secondary diagnosis (medical comorbidity) on discharge was recorded. In cases of repeated admissions of the same individual, they were recorded as different cases (admissions). Income, distance from the medical facility, as well as level of education of patients were not included in the hospital register thus were not included in the analysis. Data on occupation was incomplete and was not included in the analysis. Ethical clearance was obtained from the ethics committee of the Enugu State University of Science and Technology Teaching Hospital. Data was manually sorted and coded in a personal computer. Statistical analysis was done using SAS software SAS Institute, Cary, NC, USA, version 9.2.

**Results**

A total of 4,447 patients were admitted during the period under review. Out of this number 582 were excluded because of incomplete data or unavailable records and the remaining 3,865 (86.9%) were analyzed. Males were 2,312 (59.8%) and females 1,553 (40.2%); the male female ratio was 1.5:1. Most patients were city dwellers 2,510 (64.9%) and the rest (34.1%) came from surrounding towns and villages. The age range was 14-105 years with a mean age of 54.3 (18.1) years (men 53.1 (18.2), and women 51.7 (17.9), $P < 0.01$) and a median age was 55 years. The peak decade of admission was the 6th decade (19.8%). The number of days spent on admission ranged from 24 h to 91 days with a mean of 7.7 (6.7) days.

The total number of cases reported among the 3,865 patients admitted was 5,486. Primary diagnosis were 3,865 (70.5%) and 1,621 (29.5%) had a second or third diagnosis (medical comorbidity). The age distribution of medical disorders is shown in Table 1. The 4 commonest causes of medical ward admissions (5 primary diagnosis) were diseases of the

**Table 1**: Distributions of medical disorders admitted into the medical wards of the hospital by age groups

| Disorder | <20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | >70 years | Total |
|----------|-----|-------|-------|-------|-------|-------|---------|-------|
| *NDs* | 26 (3.1) | 41 (4.8) | 64 (7.5) | 145 (17.1) | 203 (23.9) | 206 (24.2) | 165 (19.4) | 850 (22) |
| *DM* | 11 (1.5) | 52 (7.1) | 57 (7.8) | 144 (19.6) | 186 (25.3) | 166 (22.6) | 119 (16.2) | 735 (19.1) |
| *CVDs* | 9 (1.3) | 35 (4.9) | 55 (7.7) | 117 (16.3) | 171 (23.8) | 179 (24.9) | 152 (21.2) | 718 (18.5) |
| *Ds* | 37 (6.1) | 153 (25.3) | 150 (24.8) | 111 (18.4) | 57 (9.4) | 42 (6.9) | 51 (8.4) | 604 (15.6) |
| *GIDs* | 28 (6.1) | 105 (22.7) | 65 (14.1) | 87 (18.8) | 72 (15.6) | 65 (14.1) | 40 (8.7) | 462 (12) |
| *ResDS* | 4 (1.6) | 31 (12.6) | 33 (13.4) | 48 (19.4) | 45 (18.2) | 40 (16.2) | 46 (18.7) | 247 (6.4) |
| *ResDS* | 12 (10.7) | 30 (26.8) | 19 (17) | 10 (8.9) | 17 (15.2) | 13 (11.6) | 11 (9.8) | 112 (2.9) |
| *Hematology* | 16 (21.9) | 20 (27.4) | 13 (17.8) | 6 (8.2) | 6 (8.2) | 6 (8.2) | 6 (8.2) | 73 (1.9) |
| *Dermatology* | 1 (7.1) | 1 (7.1) | 1 (7.1) | 3 (21.4) | 2 (14.3) | 2 (14.3) | 4 (28.6) | 14 (0.4) |
| **PoE** | 0 | 1 (14.3) | 1 (14.3) | 3 (42.9) | 2 (28.6) | 0 | 0 | 7 (0.2) |
| Others | 2 (4.7) | 4 (9.3) | 8 (18.6) | 10 (23.3) | 6 (14) | 8 (18.6) | 5 (11.6) | 43 (1.1) |
| Total | 146 (3.8) | 473 (12.2) | 466 (12.1) | 684 (17.7) | 767 (19.8) | 727 (18.8) | 602 (15.6) | 3865 (100) |

*NDs*: Neurological disorders, *DM*: Diabetes, *CVDs*: Cardiovascular disorders, *IDs*: Infectious disorders, *GIDs*: Gastrointestinal disorders, *ResDS*: Respiratory disorders, **PoE**: Poisoning and evenomanon
years, the disease entities encountered most were DM 735 (19%), hypertension occurred in 702 out of the 850 (82.6%) subjects with DM was the only endocrine disorder admitted into the wards.

Table 2: Distribution of medical comorbidities (secondary diagnosis) in patients with different disorders

| Hypertension | Diabetes | HIV | Total |
|--------------|----------|-----|-------|
| *NDs*        | 398 (30.9) | 304** (100) | 702 |
| *DM*         | 413 (32.1) | 413 | |
| *Ds*         | 127 (9.9) | 127 | |
| *GITDs*      | 155 (12.0) | 155 | |
| *ResDs*      | 113 (8.8) | 29 (96.7) | 142 |
| Renal        | 32 (2.5) | 32 | |
| Hematology   | 17 (1.3) | 17 | |
| Dermatology  | 9 (0.7) | 1 (0.3) | 9 |
| Others       | 23 (1.8) | 23 | |
| Total        | 1287 | 304 | 1621 |

*NDs*: Neurological disorders, *DM*: Diabetes, *CVDs*: Cardiovascular disorders, *IDs*: Infectious disorders, *GITDs*: Gastrointestinal disorders, *ResDs*: Respiratory disorders, **P/E**: Poisoning and evenomation

Table 3: Distribution of medical ward admission among urban and rural dwellers

| Urban | Rural | P value |
|-------|-------|---------|
| *NDs* | 561 (22.4) | 287 (21.2) | <0.001 |
| *DM*  | 505 (20.1) | 227 (16.8) | <0.001 |
| *CVDs*| 448 (17.8) | 266 (19.6) | <0.001 |
| *Ds*  | 392 (15.6) | 211 (15.6) | <0.001 |
| *GITDs*| 296 (11.8) | 166 (12.3) | <0.001 |
| *ResDs*| 153 (6.1)  | 94 (6.9)  | <0.001 |
| Renal | 70 (2.8)  | 42 (3.1)  | 0.00 |
| Hematology | 44 (1.8)  | 29 (2.1)  | 0.08 |
| Dermatology | 10 (0.4)  | 4 (0.3)  | 0.11 |
| **P/E** | 4 (0.2)  | 3 (0.2)  | 0.70 |
| Others | 27 (1.1)  | 26 (1.9)  | 0.53 |
| Total  | 2510 (64.9) | 1355 (34.1) | <0.001 |
| Alive  | 2510 (80.8) | 1074 (79.3) | |
| Dead   | 482 (19.2)  | 281 (20.7) | 0.25 |

*NDs*: Neurological disorders, *DM*: Diabetes, *CVDs*: Cardiovascular disorders, *IDs*: Infectious disorders, *GITDs*: Gastrointestinal disorders, *ResDs*: Respiratory disorders, **P/E**: Poisoning and evenomation

Table 4: Distribution of medical admissions over the five year period under review

| 2006  | 2007  | 2008  | 2009  | 2010  |
|-------|-------|-------|-------|-------|
| *NDs* | 184 (19.5) | 244 (24.6) | 205 (23.6) | 115 (22.2) | 100 (18.7) |
| *DM*  | 186 (19.7) | 173 (17.4) | 174 (20.1) | 102 (19.5) | 103 (19.2) |
| *CVDs*| 169 (17.9) | 165 (16.6) | 109 (12.5) | 78 (14.9)  | 78 (14.6)  |
| *Ds*  | 165 (17.5) | 173 (17.4) | 114 (11.5) | 74 (14.2)  | 49 (9.1)   |
| *GITDs*| 121 (12.8) | 114 (11.5) | 104 (12)  | 74 (14.2)  | 49 (9.1)   |
| *ResDs*| 50 (6.3)  | 57 (5.7)  | 55 (6.3)  | 39 (7.5)  | 46 (8.6)   |
| Renal | 22 (2.3)  | 32 (3.2)  | 23 (2.6)  | 12 (2.3)  | 23 (4.3)   |
| Hematology | 24 (2.5)  | 19 (1.9)  | 9 (1)  | 11 (2.1)  | 10 (1.9)   |
| Dermatology | - | 5 (0.5) | 3 (0.3) | 3 (0.6) | 3 (0.6) |
| **P/E** | 4 (0.4) | 1 (0.1) | - | - | 2 (0.4) |
| Others | 19 (2) | 10 (1) | 13 (1.5) | 6 (1.2) | 5 (0.9) |
| Total  | 944 | 933 | 870 | 522 | 536 |
| Alive  | 821 (81.5) | 869 (80.5) | 708 (78.1) | 443 (78.1) | 456 (82.8) |
| Dead   | 186 (18.5) | 210 (19.5) | 199 (21.9) | 124 (21.9) | 95 (17.2) |

*NDs*: Neurological disorders, *DM*: Diabetes, *CVDs*: Cardiovascular disorders, *IDs*: Infectious disorders, *GITDs*: Gastrointestinal disorders, *ResDs*: Respiratory disorders, **P/E**: Poisoning and evenomation.
The mortality pattern is shown in Tables 5-7. The overall mortality was 19.8% with more preponderance in men than women (20.2% vs. 19.3%, P = 0.47). It increased with increasing age. The mean age of deceased patients was significantly higher than in those who survived (54.2 (18.6) vs. 52.2 (17.9) years; P = 0.01). Among the survivors the mean age was lower in women than men (51.4 (17.6) vs. 52.7 (18.1) years, P = 0.02). There was no significant difference between the ages of men and women who died though women were younger (men 55 (8.1) vs. 53 (19) years; P = 0.001). The mortality rates of different disorders in different age groups are shown in Tables 5-7. GITDs mortality peaked at 51-60 years while most disorders mortality peaked after 60 years.

Strokes accounted for most of the deaths (22.3%) followed by HIV/AIDS (16.6%) as shown in Table 6. CVDs and DM each caused 15.1% of ward mortality. HIV/AIDS was the predominant cause of death in the IDs group (91.4%). Similarly strokes caused 76% of NDs related deaths.

Furthermore, the case fatality rates for strokes and HIV/AIDS were the highest (27.9% and 25.2% respectively). Mortality rate was highest above 70 years and different for men and women- Table 7. Below the age of 30 mortality rates were higher for women than men. The highest mortality rates were in women less than 20 years and above 70 years, as well as in men 31-40 years of age. Patients 61 years and above accounted for 34.4% of all admissions, and 38.7% of all deaths. Generally however, peak decades of admission also corresponded with peak decade of mortality.

**Discussion**

Omran\[^1\] coined the term “epidemiological transition” four decades ago. His theory stressed the demographic, biologic, sociologic, economic and psychologic ramifications of transitional processes in populations such as ours. Conceptually, it focused on the complex change in patterns of health and disease and on the interactions between these patterns and their demographic, economic and sociologic determinants and consequences. There is an ample evidence to document this transition in which degenerative and man-made diseases are displacing infections as the primary causes of morbidity and mortality, at least among adults, in many Nigerian communities.\[^3\-11^\] The major findings in this study: Firstly, a high rate of non-communicable disorders; secondly, high rates of neurologic and HIV/AIDS related deaths in a medical ward (HIV may be viewed as man-made disease due to breakdown in social norms occasioned by rules due to increasing westernization of the Nigerian communities) support the above theory as it relates to Nigerian populations.

The mean ages of admission and male to female ratio in this study were similar to some studies in the country\[^7\-11^\] but in...
The three non-communicable disorders (neurologic, cardiovascular and diabetes mellitus) were the commonest disorders admitted into the medical wards causing 59.6% of admissions and 60.1% of deaths. The admission rate of these disorders increased with age, and peaked at 6th and 7th decades. The frequency of disorders such as DM 19.1%, HBP/CCF 18.2%, strokes 15.9% were similar to reports by Ike et al.,[11] where HBP/CCF and strokes accounted for 18.8% and 15.9% of all medical ward admissions. High prevalence of hypertension and related disorders have been reported in a community based study by Onwubere et al.,[3] as well as several other hospital based studies.[4–11] The rates of neurological and DM admissions were as the same as in similar studies in the region.[12]

Strokes accounted for 72.2% of all neurological admissions into the medical ward, similar to 77.6% found in Kano[13] but much higher than 61.6% of neurological admissions in Port Harcourt.[14] In another report from Port Harcourt, CVDs, endocrine and renal diseases were the commonest causes of admission, a pattern quite different from the present study where renal disease was the 6th commonest cause.[8] In previous studies, the proportion of HIV/AIDS admissions varied widely from 3-26.1% in different institutions surveyed. These findings are similar to 13.1% found in this present study.

Of note in this study is the proportion of young people less than forty years (NDs 15.4% DM 16.4% and CVDs 13.9%) revealing the increasing prevalence of non-communicable disorders. NDs caused relatively twice the number of deaths as DM and CVDs and two and half times more than GITDs. As expected, most of the patients (68.5%) with IDs were between 20 and 50 years. This may be explained by the high proportion of HIV/AIDS in this sub group. This trend in the young portends a great epidemiological and economic burden for the future. The proportion of geriatric admissions (34.4%) was less than 41% reported in Port Harcourt[3] but higher than 11.1% reported in Ilorin and 11.5% in Kenya.[15]

Case fatality rates for strokes and HIV/AIDS were the highest (27.9% and 25.2% respectively) hence the need for targeted interventions to combat the menace of these disorders in our communities. Different from this study is a report from Benin[2] where HIV/AIDS related disorders were the most common cause of mortality (43.5%) followed by endocrine disease principally DM.

The general findings of this study showed the growing rates of non-communicable disorders and HIV/AIDS. CVDs, DM and stroke have shared pathophysiological mechanisms hence targeted efforts towards primary preventions in one area will affect the others. The creation of national awareness days for diabetes, hypertension strokes as well national kidney days are some of the efforts currently been taken by policy makers and other stakeholders to create awareness and screen for these disorders thus encouraging early detection and primary prevention. The high rates of HIV/AIDS admissions may reflect its high prevalence in sub Saharan Africa. The establishment of a HIV/AIDS dedicated clinic in the hospital as well the use of electronic media for dissemination of information about the infection may also be contributory. The high rate of admission may also reflect the growing acceptance of orthodox medicine in the treatment of HIV/AIDS.

Limitations

This study has some limitations. Medical record keeping in the hospital was done manually. Data on educational and socioeconomic status of the patients were not available, hence their impact on the health seeking behavior and pattern of medical admission could not be studied. This made data collection time consuming and laborious, and in some cases, to loss of data. Sometimes required data were completely inaccessible because folders or registers were torn or mutilated. Changes made to patient diagnoses in the course of their hospital stay following laboratory findings may not be reflected in the final diagnosis or as a medical comorbidity. Causes of death were only clinically evaluated instead of autopsies.

Conclusion

The commonest causes of medical ward admissions were neurologic disorders, diabetes mellitus cardiovascular diseases and infectious diseases. Efforts aimed at primary prevention will help to reduce the burden of these disorders in the community.

References

1. Omran AR. The epidemiological transition: A theory of the epidemiology of population change. Milbank Q 1971:83:731-57.
2. Akoria OA, Unuigbe EI. A 6-Month review of medical admissions in a Nigerian teaching hospital. Int J Health Res 2009;2:125-30.
3. Onwubere BJ, Ejim IE, Okafor CI, Mbah AU, Onyia U, et al. Pattern of blood pressure Indices among the Residents of a rural community in South East Nigeria. Int J Hypertens 2011;2011:621074.
4. Onwuchekwa AC, Chinemey S. Clinical profile of hypertension at a University teaching hospital in Nigeria. Vasc Health Risk Manag 2010;6:511-6.
5. Onwuchekwa AC, Asekomeh EG. Geriatric admissions in a developing country: Experience from a tertiary centre in Nigeria. Ethn Dis 2009;19:359-62.
6. Sanya EO, Akande TM, Opadijo G, Olarinoyye JK, Bojuwoye BJ. Pattern and outcome of medical admission of elderly patients seen at University of Ilorin Teaching Hospital, Ilorin. Afr J Med Sci 2008;37:375-81.
7. Odenigbo CU, Oguejiofor OC. Pattern of medical admissions at the federal medical centre, Asaba: A two year review. Niger J Clin Pract 2009;12:395-7.
8. Unachukwu CN, Agomuoh DI, Alasia DD. Pattern of non-communicable diseases among medical admissions in Port Harcourt, Nigeria. Niger J Clin Pract 2008;11:14-7.
9. World Health Organization. International statistical classification of disease and related health problems, tenth Revision-ICD 10. Available from: http://www.who.int/classification/apps/icd/cla. [Last cited on 2010].

10. Ike SO. Prevalence of hypertension and its complications among medical admissions at the University of Nigeria teaching hospital, Enugu (Study 2). Niger J Med 2009;18:68-72.

11. Ike SO. The pattern of admissions into the medical wards of the University of Nigeria teaching hospital, Enugu (2). Niger J Clin Pract 2008;11:185-92.

12. Onwubere BJ, Ike SO. Review of admissions into the medical wards of University of Nigeria teaching hospital, Enugu. Nig J Int Med 1999;2:59-62.

13. Owolabi LF, Shehu MY, Shehu MN, Fadare J. Pattern of neurological admissions in the tropics: Experience at Kano, Northwestern Nigeria. Ann Indian Acad Neurol 2010;13:167-70.

14. Chapp-Jumbo EM. Neurologic admissions in the Niger Delta area of Nigeria: A ten year review. African Journal of Neurological Sciences 2004;23:14-20.

15. McLiney SO. The pattern of geriatric admissions in the medical wards at the Kenyatta National Hospital. East Afr Med J 1993;70:37-9.

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