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Death Audit of Patients admitted at Medicine Department: Experience of Largest Tertiary Care Hospital in Bangladesh

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Abstract

Background: Brain death is the irreversible end of all brain activity (including involuntary activity necessary to sustain life) due to total necrosis of the cerebral neurons following loss of brain oxygenation. In medical practice, common causes of death include stroke, acute myocardial infraction, heart failure, septicemia, COPD with respiratory failure, poisoning etc. Vital statistics outlining the major causes of death in a population are an important measure of public health. **Objective:** The aim of this study was to identify the causes of death from acute emergency and in chronic medical diseases with their demographic profiles. **Methodology:** It was a hospital based observational study, and the study period was 3 months (July, 2010 to September, 2010). The patients who died after admission in medicine ward of Dhaka Medical College Hospital were enrolled. The death certificate was collected from the office copy and the ICD code-based certificate writing was noted. The underlying cause of death, immediate cause of death and contributory cause of death was observed to understand the exact etiology of death in Medicine department. **Results:** The study group consisted of 100 subjects of whom 56 were male and 44 were female. Male: female ratio was 1.27:1. The age range was 18-90 years. Mean age was 49.34 for male and 42.94 for female. Death occurred in 45% cases within 24 hours, 49% cases from 1 to 7 days, 6% after 7 days. The major cause of death was stroke (26%) followed by poisoning (14%). **Conclusion:** The death audit revealed that the majority cases of death in Medicine happens due to cerebrovascular accident and poisoning. *[Journal of National Institute of Neurosciences Bangladesh, January 2025;11(1):28-33]*

Keywords: Death audit; medicine Department; stroke; poisoning.

Introduction

The analysis of a significant event, such as a patient's death, is a useful approach to medical audit[1]. In medical practice, several causes of death include acute myocardial infraction, heart failure, septicemia, uncontrolled diabetes with complications, chronic obstructive pulmonary disease (COPD) with respiratory failure, kidney disease, malignancy, chronic liver disease (CLD), poisoning and so on.

Septic shock is the most common cause of death in hospital intensive care units and results from the severe hypotension and multiple organ failure that often accompany sepsis. 15 leading causes of death from a CDC report showed that major causes of death were due to diseases of heart (27.2%), malignant neoplasms (23.1%) cerebrovascular diseases (6.3%), and chronic lower respiratory diseases (5.1%) among others[2]. Vital statistics outlining the major causes of death in a population are an important measure of public health. Ranking disease agents according to the number of

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deaths they cause can be used for strategic planning and public health resource allocation. In the United States, vital statistics support efforts to control coronary artery disease, cancer, cerebrovascular diseases, and infections[3]. Infections acquired in the hospital are an important cause of death, especially those involving the bloodstream or lung[4]. The death report is practiced in simple writing in treatment card and a death certificate is issued which does not have any impact of cause or mode of death. Possibly mortality is high in our country in comparison to developed country, because we have less active manpower, less well equipped machine and ICU facility. The aim of this study was to detect the cause of death in various diseases in Medicine ward of DMCH.

Methodology

Study Settings and Population: After approval of institutional ethical committee this hospital based observational study was conducted in Medicine department of Dhaka Medical College Hospital from July 2010 to September 2010. A total number of 100 consecutive patients were selected who died after admission, both male and female (non-pregnant) in DMCH.

Study Procedure: According to the Annual Report 2009, Department of Medicine, Dhaka Medical College Hospital, Death rate was 7.07% & Male: Female = 1.62:1. After death of a patient, the corresponding unit duty doctor informed the study physician about the death. The study physician immediately observed the patient and detected the cause of death. The patient was enrolled after observation. A structured questionnaire was made to write the event. The death and time of death, underlying cause of death & contributory cause of death were recorded by the study physician. The admission time, time lag of death and ICD- code 10 were also recorded.

Statistical Analysis: Data was collected in a preformed data collection form and analyzed in Statistical Package for Social Science (SPSS) 10.0 Software for Windows. Significance levels were set at <0.05 in all cases. Data was shown in pie chart, frequency distribution table.

Ethical Consideration: All procedures of the present study were carried out in accordance with the principles for human investigations (i.e., Helsinki Declaration 2013) and also with the ethical guidelines of the Institutional research ethics. Formal ethics approval was granted by the local ethics committee (Ref: IRB/NINS/…..). Participants in the study were informed about the procedure and purpose of the study and confidentiality of information provided. All participants consented willingly to be a part of the study during the data collection periods. All data were collected anonymously and were analyzed using the coding system.

Results

A total number of 100 consecutive deaths in medicine ward were analyzed among total study period. Among 100 deaths 56% were male and 44% were female. Male and female ratio were 1.27:1. The age range was 18-90 years. Mean age was 52.36 years. The highest incidence of death occurred in 51-60 years group (22% of total death). Within this group 63.6% (n=14) were male and 36.4% (n=8) were female.

Table 1: Age Group of Study Population (n=100)

Age Group	Male	Female	Total
18 to 30 Years	7%	9%	16%
31 to 40 Years	6%	5%	11%
41 to 50 Years	10%	9%	19%
51 to 60 Years	14%	8%	22%
61 to 70 Years	9%	8%	17%
71 to 80 Years	9%	4%	13%
More than 80 Years	1%	1%	2%
Total	**56%**	**44%**	**100%**

Among 100 cases of death, stroke was the main causes of death (26%) followed by poisoning (14%). Other less common causes were death due to infectious diseases, diabetic ketoacidosis (DKA), chronic obstructive

Table 2. Causes of Death of Study Population (n=100)

Cause of Death	Male	Female	Total
Stroke	16%	10%	26%
Poisoning (OPC, snake bite, others)	6%	8%	14%
Infectious disease	7%	5%	12%
Chronic liver disease	4%	2%	6%
Acute liver failure	2%	3%	5%
COPD with respiratory failure	3%	1%	4%
Bronchial asthma with respiratory failure	1%	3%	4%
Ischemic heart disease	3%	2%	5%
Diabetic ketoacidosis	2%	3%	5%
Chronic kidney disease (End stage)	2%	1%	3%
Acute kidney injury	1%	0%	1%
Malignancy	4%	1%	5%
GBS	1%	1%	2%
Undiagnosed	3%	2%	5%
Drug reaction	0%	1%	1%
Others (non-medical cause)	1%	1%	2%
Total	**56%**	**44%**	**100%**

pulmonary diseases (COPD), chronic liver disease (CLD), acute hepatic failure, hematological malignancy and others. Among the death from infectious diseases (12%), meningoencephalitis was 6, pneumonia was 3, liver abscess was 1, intestinal and pulmonary TB were 2 in number each (Table 2).

Among the death within nervous system, it was found that stroke was the leading cause of death. Hemorrhagic stroke cases were 15 (male-8, female-7) and ischemic stroke was 11 (male-8, female-3). Majority of patients died of cerebral edema and aspiration pneumonia and sudden death occurred in 2 patients. Other less common causes were meningoencephalitis and GBS with respiratory failure. Meningoencephalitis patients developed cerebral edema and two patients had intractable seizure before death. One GBS patients died of due to lack of ICU support and another died of ventilation-associated pneumonia and ARDS in ICU (Table 3).

Among the cause of death in respiratory system, the leading causes were COPD, pneumonia and bronchial asthma. These respiratory cases died of respiratory failure and ICU support could not be managed. Patients of pulmonary tuberculosis who were severely affected were referred to NIDCH (Table 3).

Among the hepatobiliary causes of death, leading cause was CLD followed by acute liver failure. We could not provide immediate band ligation due to less availability of that facility in DMCH. Other causes were hepatocellular carcinoma (HCC) and liver abscess. Complications of cirrhosis was the underlying cause of death in HCC and sepsis and multiorgan failure was the underlying cause of death in liver abscess (Table 3).

In this study, death due to ischemic heart disease were 5 (3 were male and 2 were female). Most acute myocardial infarction cases (not taken in this study) were referred to Cardiology unit of DMCH or admitted there directly. Among the renal system, 1 death was due to acute kidney injury and 3 deaths were due to CKD (end stage). One CKD patient was given dialysis and other patients could not receive any specific treatment. Diabetic ketoacidosis comprised 5 cases of cause of death. Three patients died of cerebral edema and one patient developed septicemia and renal failure. Among the poisoning cases (14%), unknown poisoning was the leading cause of death followed by OPC. Majority of patients died of respiratory failure and ICU support could not be provided. Males were affected more by unknown poisoning whereas OPC was the leading

Table 3. Underlying causes of death (n=100)

Cause of Death	Known underlying causes of death	Unknown	Total
Stroke	Cerebral edema (14%)	2%	26%
	Aspiration pneumonia (10%)		
Poisoning (OPC, snake bite, others)	Respiratory failure (12%)	0%	14%
	Arrhythmia (2%)		
Infectious disease	Septic shock (7%)	2%	12%
	Multiorgan failure (3%)		
Chronic Liver disease	Hepatic encephalopathy (4%)	1%	6%
	Variceal bleeding (1%)		
Acute Liver failure	Hepatic encephalopathy (3%)	2%	5%
COPD with respiratory failure	Respiratory failure (3%)	0%	4%
	Septic shock (1%)		
Bronchial asthma with respiratory failure	Respiratory failure (4%)	0%	4%
Ischemic heart disease	Arrhythmia and shock (5%)	0%	5%
Diabetic ketoacidosis	Cerebral edema (3%)	2%	5%
Chronic kidney disease (End stage)	Cardiovascular (2%)	1%	3%
Acute kidney injury	Uremia (1%)	0%	1%
Malignancy	Multiorgan failure (3%)	1%	5%
	Status epilepticus (1%)		
GBS	Respiratory failure (2%)	0%	2%
Undiagnosed	Respiratory failure (2%)	3%	5%
Drug reaction	Steven Johnson syndrome (1%)	0%	1%
Others (non-medical cause)	Respiratory failure (1%)	1%	2%
Total	**85%**	**15%**	**100%**

cause of death in females. OPC is easily available in household areas as a pesticide and this might be the cause of more OPC poisoning by females. Underlying causes could be detected in 85% of all cases of death (Table 3).

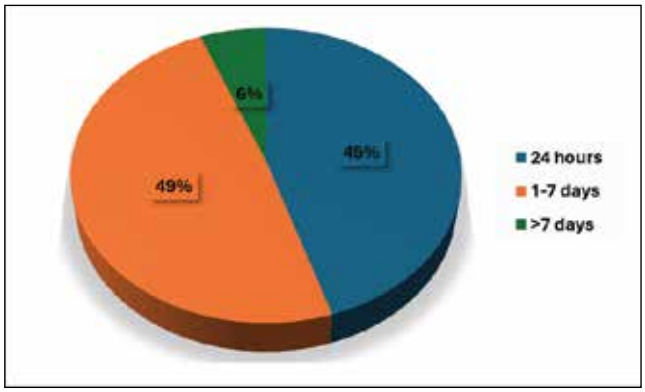

Figure I: Death time after admission

Among the study patient, 45% of death occurred within 24 hours, 49% within 1 to 7 days and only 6% death occurred after 7 days (Figure I).

Non communicable (NCD) diseases constituted major cause of death (81%). Rest were communicable diseases (12%) and others.

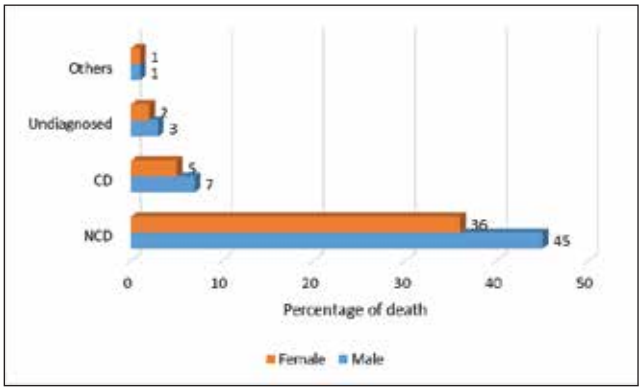

Figure II: Distribution of death by Non communicable (NCD) & Communicable disease (CD)

According to ICD-10, infectious diseases were 12%, neoplasm were 5%, endocrine, nutritional and metabolic diseases were 5%, diseases of the nervous system were 28%, diseases of the circulatory system were 5%, diseases of the respiratory system were 8%, diseases of the digestive system were 11%, diseases of the genitourinary system were 4%, unclassified diseases were 7%, poisoning and drug reaction cases were 15%.

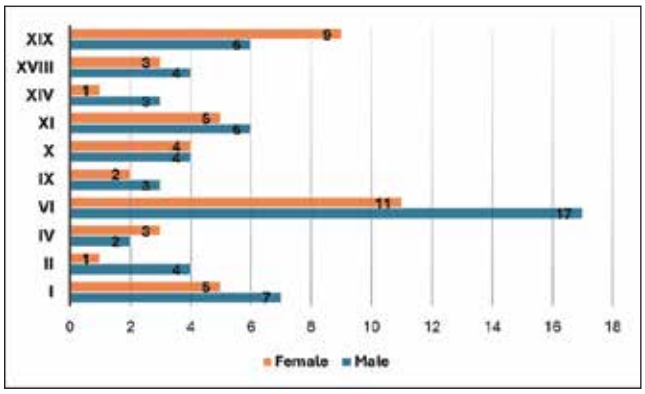

Figure III: Number of cases according to International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) [I- Infectious disease, II- Neoplasm, IV- Endocrine, nutritional and metabolic diseases, VI- Diseases of the nervous system, IX- Diseases of the circulatory system, X- Diseases of the respiratory system, XI- Diseases of the digestive system, XIV- Diseases of the genitourinary system, XVIII=Unclassified, XIX- Poisoning].

Discussion

This observational, cross-sectional study was done to find out the cause of death, to see the variability of time lag of death, to see few demographic characteristics of death cases in medicine department of Dhaka Medical College Hospital (DMCH), Dhaka, Bangladesh. A total of 100 consecutive death cases of which male was 56 cases and female was 44 cases were included in the study, who were admitted in different medical wards of DMCH from July 2010 to September 2010.

In this study majority of death was due to stroke 26%. This finding is not consistent with the 15 leading causes of death in 2004 in USA[2] where main cause of death was due to diseases of the heart (27.2%) followed by cancer (23.1%), and death due to stroke comprised only 6.3%. This is because we had no dedicated stroke unit in DMCH which was the main cause of high mortality in stroke. The main cause of cardiac disease causing death was acute myocardial infarction which admitted in cardiology unit of DMCH (excluded from our study). In this study, meningitis including tubercular meningitis were 6 (males-4, females-2). Pneumococcal meningitis was associated with the highest case fatality ratios (CFRs) globally[5].

In this study, 2 GBS cases had been detected, both of them died due to respiratory failure. A Cochrane Database Review combined the largest trials into a meta-analysis and also concluded that IVIg is as effective as plasma exchange in hastening recovery from GBS in patients who required assistance to walk[6]. In the worsening phase of GBS, most patients require

monitoring in a critical care setting. In DMCH, only limited facilities were available in ICU to accommodate & provide care for these enormous patients. Mortality was also high due to economic constraint of the patient who couldn't buy IVIg or bear the cost of ICU in the private settings.

In this study, death due to COPD was 3 for male and 1 for female among death cases. From CDC report[2], COPD cases were 5.1% which is consistent with this study (4%). Exacerbations are prominent feature of natural history of COPD. All admitted COPD patients present with exacerbation in DMCH. They require adequate bronchodilators, antibiotics, glucocorticoids, oxygen and mechanical ventilator support occasionally. There was no separate corner for management of COPD patients and oxygen supply was also insufficient. In refractory cases, patients could not even provide themselves with critical care setting in the DMCH due to lack of bed.

In this study, 6 CLD cases [male- 4; female-2] were found & fulminant hepatic failure cases were 5 [male-3; female-2]. In the USA death due to CLD is 1.1% and no death has been found due to fulminant hepatic failure2. This wide variation in death between these two countries may reflects the many early opportunities of liver transplantation in the developed countries. Despite declines in chronic liver disease/cirrhosis (CLD) mortality over the last several decades, CLD has remained consistently among the 15 leading causes of death in the United States[7,8]. In acute hepatic failure mortality is very high even with treatment and liver transplantation is an increasingly important treatment option. There was no place in Bangladesh where liver transplantation was done.

In this study, DKA cases were 5 out of 100 [male-2; female-3]. In the USA, diabetes mellitus comprises only 3% of death cases[6]. This low level reflects early recognition of the diabetes and prompt action to combat the complications and mortality. Death rate due to DKA is high in Bangladesh. In one study it was recorded 13.4%[9].

AML comprises 3 death cases in this study [male-2; female-1] and one patient died of hepatocellular carcinoma. Most of the leukemia cases were transferred to the Hematology department so actual death case could not be evaluated. Most death cases were due to lack of adequate supportive treatment and specific therapy (bone marrow transplantation) which was not available in our country. All patients developed septicemia and one patient developed intracerebral hemorrhage. Other malignant neoplasm cases (not included in our study) were referred to National Institute of Cancer Research & Hospital (NICRH) or Radiology & Oncology Department of DMCH.

In this study, death due to kidney diseases comprises 4%, in contrast to the 1.1% death in USA[2]. This significant difference reflects the less availability of renal replacement therapy in our country. Most of the CKD cases were transferred to nephrology unit which was also lacking emergency admission and urgent dialysis. Most moribund cases were admitted through medicine unit and due to less bed in nephrology department, most patients died in medicine department. In nephrology department, there was no separate dialysis unit, so many patients could not get themselves admitted and they were ultimately referred to National Institute of Kidney Diseases and Urology (NIKDU) which was also overburden with so many patients. Sometimes patients with kidney diseases were referred to DMCH from NIKDU due to unavailability of the bed. In this study, 2 death cases were due to pulmonary TB having extensive lung involvement with respiratory failure. Most of the open cases of pulmonary TB were referred to chest hospital, so actual death cases could not be detected.

In this study, ischemic heart disease (myocardial infarction, MI) cases were 5 (male- 3, female-2). Main cause of death in USA[2] was due to heart diseases including myocardial infarction (28.5%). We found only 5 cases because patients with acute MI was admitted in cardiology unit of DMCH (excluded from our study).

In this study, poisoning was the second most common cause of death affecting 14 patients, 10 of whom died within 24 hours who were severely poisoned. In emergency department, stomach wash was given in an unhygienic environment. In the ward, there were no adequate facilities including ICU to monitor the cardiorespiratory impairment of the patients.

In this study, 45% of death occurred within 24 hours, 49% death within 1-7 days and only 6% of death occurred 7 days after hospitalization. This result contrasts with a study done in a hospital in Nigeria[10], where thirty percent of all death occurred on the first day of admission. This high number of death occurred due to unavailability of dedicated stroke, dialysis, hepatology and respiratory units in DMCH along with adequate number of modern facilities like central oxygen line, ICU bed and less medical personnel with overburden patients' load in DMCH.

Conclusion

This hospital based cross sectional study was carried out over 100 death cases to see the causes of death, age and sex distribution of patients and the variability of time lag of death after admission. Analysing individual deaths can disclose important areas where the process of care can be improved even when the outcome (death) is not amenable to intervention by health care professionals. The present study highlights the common cause of death in medicine ward of DMCH in a three months' period. Majority of death occurred due to stroke and 45% of death occurred within a day of admission. Immediate neurosurgical interventions are needed in all large stroke cases which was lacking in DMCH which accounted for many causes of death in stroke. This type of study should be carried out in a longer period and in a good number of patients to find out the actual cause of death and it will help to recover our pitfall in the health sector.

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Contribution to authors: Shaikh MMI, Islam MZ, Hussain ME conceived and designed the study, analyzed the data, interpreted the results, and wrote up the draft manuscript. Hussain ME, Mamun AA, Hoque MA involved in the manuscript review and editing. Mamun AA, Hoque MA, Rahman A conceived and manuscript writing. All authors read and approved the final manuscript.

Data Availability
Any inquiries regarding supporting data availability of this study should be directed to the corresponding author and are available from the corresponding author on reasonable request.

Ethics Approval and Consent to Participate
Ethical approval for the study was obtained from the Institutional Review Board. As this was a prospective study the written informed consent was obtained from all study participants. All methods were performed in accordance with the relevant guidelines and regulations.

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References

1. Buckley G. Clinically significant events. Medical audit and general practice. London: BMJ. 1990.
2. Miniño AM, Heron MP, Murphy SL, Kochanek KD. Deaths: final data for 2004..
3. National Center for Health Statistics. Vital statistics of the United States. 119th ed. Washington: U.S. Census Bureau. Statistical abstract of the United States;1999. p.99.
4. Wenzel RP. The mortality of hospital-acquired bloodstream infections: need for a new vital statistic?. International journal of epidemiology. 1988 Mar 1;17(1):225-7.
5. Glaser D, Cummins RO, Graves JR, Larsen MP. Outcomes of bacterial meningitis in children: a meta-analysis. Pediatr Infect Dis J. 1993 May;12:389-94.
6. Hughes RA, Swan AV, Van Doorn PA. Intravenous immunoglobulin for Guillain-Barré syndrome. Cochrane Database of Systematic Reviews. 2014(9).
7. Kung HC, Hoyert DL, Xu J, Murphy SL. Deaths: final data for 2005.
8. Singh GK, Hoyert DL. Social epidemiology of chronic liver disease and cirrhosis mortality in the United States, 1935–1997: trends and differentials by ethnicity, socioeconomic status, and alcohol consumption. Human biology. 2000 Oct 1:801-20.
9. Zabeen B, Nahar J, Mohsin F, Azad K, Nahar N. Diabetic ketoacidosis in children-an experience in a tertiary hospital. Ibrahim Medical College Journal. 2008;2(1):17-20.
10. Garko SB, Ekweani CN, Anyiam CA. Duration of hospital stay and mortality in the medical wards of Ahmadu Bello University Teaching Hospital, Kaduna. Annals of African medicine. 2003;2(2):68-71.