Mortality pattern and causative factors in the critically ill patients in a tertiary care centre

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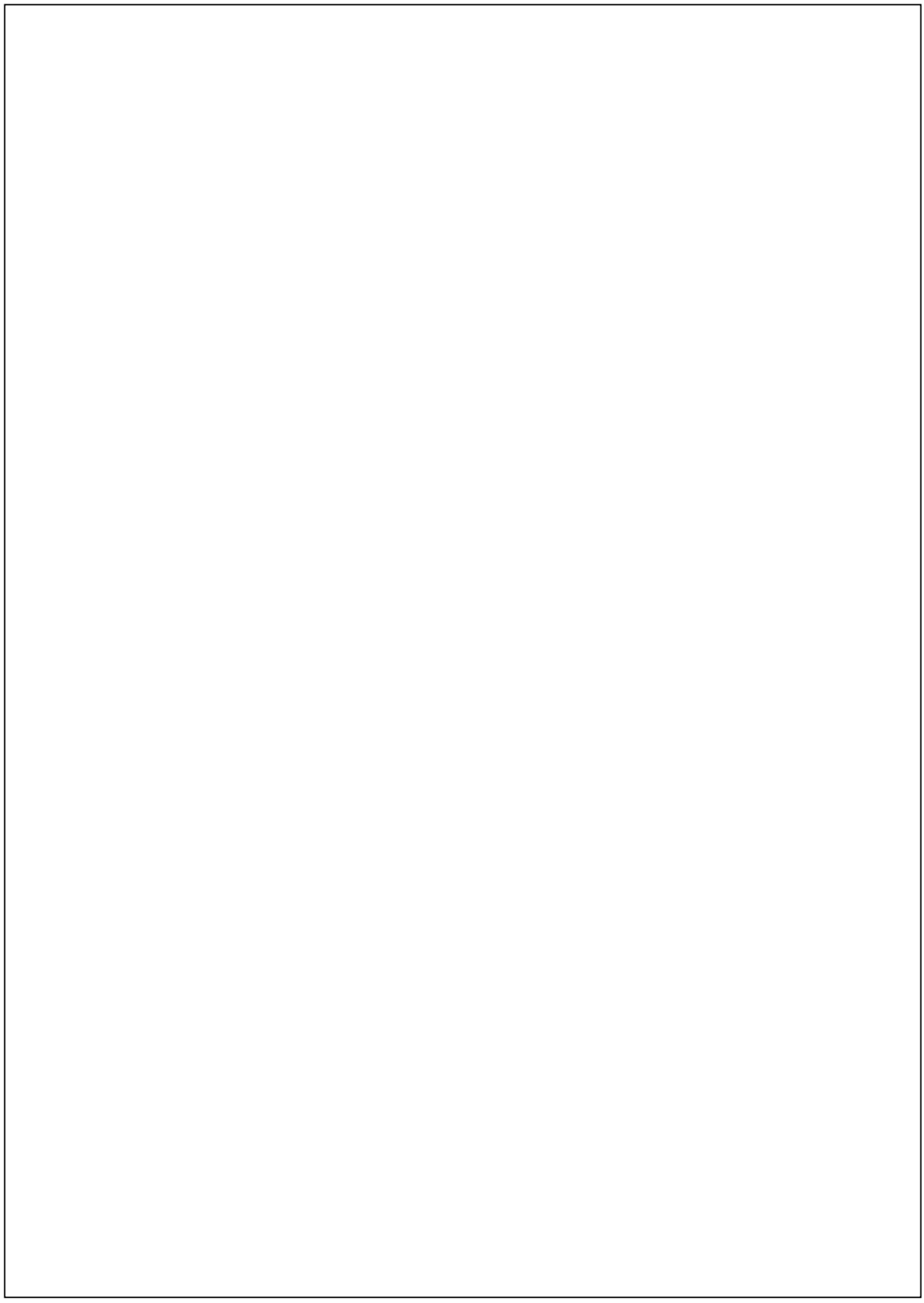


Mortality pattern and causative factors in the critically ill patients in a tertiary care centre

Abstract:

The exposure to several risk factors, non-communicable diseases (NCDs) develop into the primary basis of death leading cause of death globally, accounting for more fatalities than all other causes combined. Countries with low and moderate incomes are especially affected. Hospital admission statistics are largely lacking in developing nations. Thus, this study will assist us in evaluating the prevalent disease patterns found in ICU. This study covered all patients who were admitted to BMCH for emergency care between January 1, 2023, and December 31, 2024. Clinical factors included the primary diagnosis with comorbidities from the previous two years' hospital records previous to the emergency hospitalization. The causes of the 149 cases in our centre were as follows: 26.17 percent had primarily cardiac problems, 15.44 percent had respiratory problems, 12.75 percent had encephalopathy and stroke, 12.75 percent had Multiple Organ Dysfunction Syndrome (MODS), 12.08% had renal problems, 12.08% had cancer, 2.68 percent had liver complications, and 1.34% had only diabetes mellitus, trauma, poisoning, and tuberculosis cases. In the upcoming years, there will be a significant global increase in the prevalence of pulmonary disorders, chronic kidney disease, and cardiovascular diseases, which will negatively impact society and the economy. An important route for preserving body homeostasis and slowing the development of systemic disease is the kidney-heart-lung axis. These organs have similar mechanisms that could contribute to the start and progression of these diseases. According to our findings, the heart is the primary effect of death in the intensive care unit, followed by the lung, kidney, and brain.

Key words: Non-Communicable diseases, Prevalence, Public Health Care, ICU, Mortality, COPD, CAD, Lung

Introduction:

Non-communicable diseases (NCDs) are the major cause of death worldwide, rationale for more deaths than all other causes combined due to exposure to several risk factors. Low and middle-income nations are particularly afflicted. 73% of fatalities from NCDs occur in low- and middle-income nations. Non-communicable diseases (NCDs) present around 5.87 million deaths that report for 60 % of all deaths in India. Over two-thirds of all NCD-related deaths in the WHO's South-East Asia Region (SEAR) occur in India. [1]

Cardiovascular diseases account for at least 19 million of NCD fatality in 2021, followed by cancer (10 million), chronic respiratory diseases (4 million), and diabetes (which causes more than 2 million deaths, including kidney diseases). These four disease types responsible for 80% of all premature NCD deaths. In Asian continent, it is often linked to poverty, illiteracy, epidemic of tobacco consumption, exposure to allergens, solid biomass fuel, working/living in congested and poor sanitary conditions, social, geographical issues and economic barriers in seeking appropriate health care. India presently faces a double burden of disease: non-communicable diseases have emerged with both immediate and long-term effects, while communicable diseases have not been significantly reduced. This study directed to determine the extent of chronic illness responsible to emergency admissions and mortality at a tertiary care hospital over two years. [2]

Methods:

The study was a retrospective observational, single-centre study. This study was approved by Bhaarath Medical College and Hospital (BMCH) Institutional Review Board. The study hospital, Bhaarath Medical College and Hospital and has over 1000 inpatient beds is one of the tertiary medical care set up which mostly provides healthcare to the general public in the southern region of Chennai. We planned the research using the information repository available in the Medical Records Department which provides comprehensive clinical services. Annually, the BMCH accept more than 1000 ICU patients, among which more than 700 become inpatients. All patients who underwent emergency admissions at BMCH from 1st January 2023 to 31 st December 2024 were included in this study. Clinical variables included the presence of 149

fatalities with comorbidities from the past 2 years of hospital discharge records. To maintain anonymity, patient identifying information was eliminated.

The 149 cases multimorbidity defined in our report included Diabetes, Hypertension, moderate to severe renal disease, Congestive Cardiac Failure, Stroke, Pulmonary Oedema, Acute respiratory distress, cancer without metastases, moderate to severe liver disease, metastatic solid tumour.

Results:

Table 1: Probable Mortality factors

Diagnosis	Freq.	Percent
HEART	39	26.17
LUNG	23	15.44
MODS	19	12.76
BRAIN	19	12.76
CANCER	18	12.08
KIDNEY	18	12.08
LIVER	4	2.68
POISON	2	1.34
DM	2	1.34
TB	2	1.34
TRAUMA	2	1.34
SEPSIS	1	0.67
Total	149	100

There were 149 fatalities amongst patients admitted in the emergency ward in the year 2023 and 2024. Among the 149 patients, 31 were with diabetes mellitus (DM), 12 were with systemic hypertension (SHTN) and 25 were both with DM & SHTN. Male were 57.05% and female were 42.25%. Maximum cases fell between the age group 51 to 80.51-60 were 36, 61-70 were 34 and 71-80 were 36.

Out of the 149 cases, 26.17 % were with predominantly cardiac issues, 15.44 % with respiratory problems, 12.75 % were with encephalopathy and stroke, 12.75 % with Multiple Organ Dysfunction Syndrome (MODS), 12.08% with renal issues, 12.08% were with cancer

and 2.68 % with liver complication and 1.34 % with only diabetes mellitus, trauma, poison, TB cases respectively were other causes.

Figure 1: The root cause for the fatality

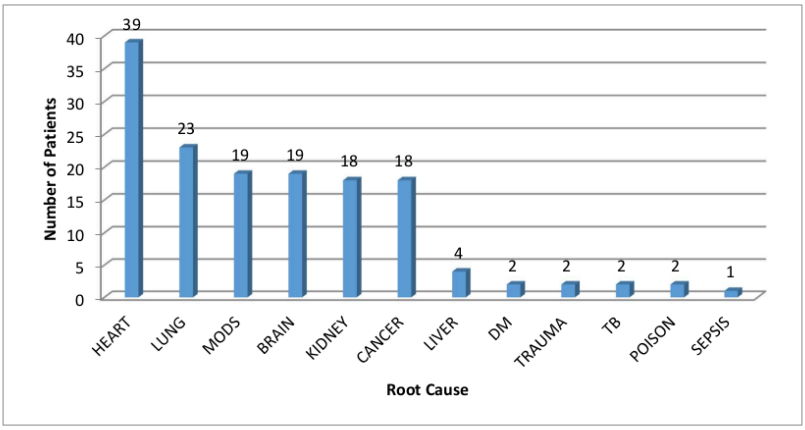
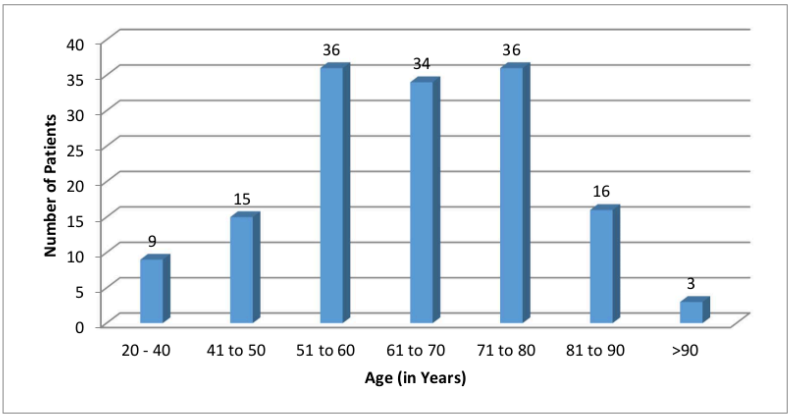


Figure 2: Age wise Analysis



Discussion:

The ICU admission patient population at BMCH constitute a broad geographic dispersion throughout the Tambaram city municipality, located in the Chengalpattu district. It covers an area of 87.64 sq. km in the Chengalpattu district, and has a population of 722,982. Tambaram is the 20th civic body to become a municipal corporation in Tamil Nadu.

The percentage of people admitted in the ICU at BMCH with multi-morbidity remained unchanged for all the age group. The elderly population consistently has a higher number than the non-elderly population (51 to 80). [3] A number of studies have showed a continuous increase in the absolute rate of ICU admissions. The principal findings of this study concerning patterns, characteristics, baseline clinical data, and spectrum of emergency department admissions; primary causes of such admissions are presented. [4]

This study also indicated that ICU admissions were gradually rising with age, peaking between the ages of 51 and 80. This suggests that the sedentary life style may probably lead to more burden of diseases. Both results are consistent with prior research done to ascertain Nigeria's ED admission patterns. This study showed that among the fatal cases, the development of cardiogenic and pulmonary issues may be substantially correlated with comorbidity, cigarette smoking, rural residency, and underlying heart illness. The underlying diseases may be Hypertensive heart disease (HHD), Ischemic heart disease (IHD), Acute heart failure (AHF) or Chronic rheumatoid heart disease (CRHD). [5,6]

The most frequent cause of mortality in the emergency room, according to a study done at the tertiary centre in Addis Ababa, Ethiopia, was heart problems. Cardiogenic pulmonary oedema and AHF. The most frequent reason, according to a different study conducted in Spain, the Netherlands, and Poland, was heart problems. Additionally, Attias et al. found that 75% of people with valvular heart disease had cardiogenic illnesses. [7,8]

Worldwide The burden of respiratory disorders on the healthcare system is enormous. Lung cancer, TB, pneumonia, COPD, and bronchiectasis continued to be the top five reasons for respiratory hospitalizations. Patients with concomitant cardiac and respiratory conditions

experience overlapping symptoms of dyspnoea and chest discomfort. Lung problems were the second most common fatal cause in this study. Umoh VA in Nigeria and Alamoudi OS et al. in Saudi Arabia both showed similar results. These results align with the research conducted by Kumar A. et al. The most likely significant contributing causes to the increased prevalence are COPD due to tobacco use and both indoor and outdoor air pollution. A progressive condition characterized by high pulmonary artery pressure, pulmonary hypertension exacerbates heart, lung, or systemic problems. In elderly individuals, it also contributes to high rates of morbidity and mortality. A research by Shrestha B et al. in Nepal found that COPD affected nearly half of hospitalized patients. [9]

In general, a majority of population over 85years of age had bilateral peripheral neurological deficits. Neurological impairments were present in 12.75 percent of the participants in our study. Age-related alterations in myelin protein expression and a decreased capacity to repair injured myelin have been found in pathophysiological investigations. In other aging tissues, comparable alterations have been observed. [10,11]

Renal problems are a degenerative disease that affects over 800 million people worldwide, or over 10% of the global population. Because low and middle-income nations are the least equipped to deal with the consequences of kidney disease, the cost of these conditions is disproportionately high there. As the population ages and the number of people with diabetes mellitus (DM) increases, the incidence of both acute and chronic kidney disease is expected to increase as well. About 30% of diabetic people in India develop diabetic nephropathy. In the present study Kidney diseases were the fourth major problems. Other complications we report are multi organ dysfunction syndrome (MODS) which may be many underlying causes. Few cases were reported with cancer, liver complications, diabetes mellitus only, traumatic cases, poison subjects, TB cases and sepsis cases. [12,13]

In India, PN from diabetes, GBS, leprosy, toxin-like arsenic, and TOCP poisoning is frequent due to a variety of ethnic and environmental factors. However, well-designed studies are lacking for other neuropathies, such as hereditary neuropathies, drug-influenced neuropathies, and vasculitic neuropathies. [14,15]

Conclusion:

The prevalence of cardiovascular diseases, chronic kidney disease and Pulmonary disorders would sharply increase worldwide in the next years, having detrimental effects on the

economy and society. The kidney-heart-lung axis is an essential pathway for maintaining bodily homeostasis and preventing the progression of systemic disease. These organs are comparable mechanisms that may have a role in both illnesses' development and onset. The study's findings indicate that the most common mortalities in the ICU are due to preliminarily heart, followed by lung, kidney and brain.

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