



## PROFILE OF DISEASES THAT AFFECT THE ADMITTED ELDERLY PATIENTS WITH THEIR MORBIDITY AND MORTALITY PATTERNS IN A TERTIARY CARE CENTRE

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### ABSTRACT

**Background:** This study was conducted to find the morbidity & mortality patterns in elderly patients and the profile of diseases that affect those elderly patients admitted in our hospital in a developing country and gives information about their gender distribution and urban versus rural residence. The objective is to find their morbidity and mortality patterns in a tertiary care hospital associated with Government Medical College Srinagar, in India.

**Material and Methods:** In this prospective study, all elderly patients who were admitted in our medicine ward in Sri Maharaja Hari Singh hospital [SMHS] (associated hospital of Government Medical College, Srinagar) were studied over a period of 18 months. The elderly are defined as persons aged 65 years and above [1]. A total of 400 elderly patients were admitted during these 18 months. Patients were studied for their presenting complaints, comorbidities, diagnoses, residence and gender distribution.

**Results:** A total of 400 elderly patients were admitted during these 18 months. Out of these, 25.25% patients expired. Males were 44.25% and females 55.75%. 66% of patients were rural and 34% were from urban areas. 30% were hypertensives. Most common cause for admission was infections involving urinary tract followed by pneumonia. This was followed by admissions due to acute exacerbation of Chronic obstructive pulmonary disease (COPD) and haemorrhagic strokes. Most common cause of death in our patients was infections followed by haemorrhagic stroke and myocardial infarction.

**Conclusion:** There is a need for information regarding the characteristics of admissions of elderly people to help in planning health services for the same.

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## INTRODUCTION

Elderly comprised 6.2% of the world population in 1992 and is estimated to reach 20% by 2050 [2]. The health of the elderly is an important focus of health policies, with geriatric medicine aiming to enhance the general well-being of the older people [3]. All of us need basic and continuing geriatric education to improve care for older adults [4].

Aging is itself associated with many chronic illnesses and comorbidities [5],[6], polypharmacy and changes in the immune system [5],[7]. The functioning of cardiovascular, respiratory, and renal systems in the elderly wanes, which is by itself a frequent cause of admissions. It is the malfunctioning of these systems that causes an immunocompromised state and predisposes to many infectious and noninfectious diseases contributing to the increased morbidity and mortality in this group of patients. Poor nutrition and breakdown of natural mechanical barriers which are commonly seen in the elderly also contribute to infections in them [8]. In addition, both morbidity and

mortality for many infections may be several-fold higher in the elderly as compared to the young [9]. Diminution of physiologic reserves like decreased cough reflex lead to aspiration pneumonia, impaired arterial and venous circulation, and compromised wound healing, make cellulitis more common [2]. The overall accumulation of comorbid conditions and decrease of functionality and physiologic reserve is referred to as frailty [10].

The elderly usually become bed ridden that decreases muscle strength, causes contractures, decreases aerobic capacity, accelerates bone loss and increases deep venous thrombosis risk. Falls are more common in elderly because of orthostatic hypotension, bed rest, use of sedatives plus confusions in hospital environment (in admitted patients). Pressure ulcers are common due to poor nutrition, incontinence of urine and stools and chronic disorders.

Elderly patients with diabetes commonly develop oral candidiasis, urinary tract infections, skin and soft tissue infections, osteomyelitis, tuberculosis, pneumonia related to gram negative bacteria, cholecystitis, and gastrointestinal infections [11]. One study has revealed 17% to 55% of

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women and 15% to 31% of men among elderly are bacteriuric [12].

Hospitalization for medical illnesses is itself a risk factor for death among elderly because of the adverse effects including nosocomial infections, loss of independence, disability, social isolation, and iatrogenic conditions [13]. There is progressive functional, physical, and cognitive decline of the normal aging process after hospitalisation. Thus, most elderly do not return to their previous functional level following discharge from a hospital [13].

Delirium occurs in 11%-42% of medical elderly in-patients [14]. The reported prevalence rates of cognitive impairment in congestive heart failure, COPD, and diabetes mellitus vary between 25% and 74% [15],[16],[17]. Multi-morbidity is more prevalent in elderly as compared to isolated disease states [18],[19],[20].

In most cases, cancers occurs after 60 years of age because about 80% of all cancers are related, directly or indirectly, to the exposure time to carcinogens [21].

## **MATERIAL AND METHODS**

In this prospective study, all elderly patients who were admitted in our medicine ward in Sri Maharaja Hari Singh hospital [SMHS] (associated hospital of Government Medical College, Srinagar) were studied over a period of 18 months. The elderly are defined as persons aged 65 years and above [1]. A total of 400 elderly patients were admitted during these 18 months. Very elderly were defined as those 75 years and above. The sex distribution of patients was seen and their residence in rural or urban areas was also studied. The patients were studied for their presenting complaints and the underlying comorbid illnesses that already existed before admission. Among these, the expired ones were also studied. Among discharged patients, we saw the fraction who recovered within a week's time versus those who needed prolonged stay.

## **RESULTS**

A total of 400 elderly patients were admitted during these 18 months. 178/400 (44.50%) were very elderly defined as those 75 years and above. Those patients who were discharged within a week comprised 26.25% (105/400) of patients. 194/400 (48.50%) patients were discharged after a week's time. 101/400 (25.25%) patients expired. Males were 177/400 (44.25%) and females 223/400 (55.75%). 264/400 patients (66%) were rural and 136/400 (34%) were from urban areas. 120/400 (30%) were hypertensives (6 were admitted with accelerated hypertension). 69 (17.25%) were diabetic.

The most common disease affecting our patients was infection. 28 were admitted with septic encephalopathy, 12 had multi organ dysfunction syndrome (2 developed symmetric peripheral gangrene). 61 were admitted with urinary tract infection (UTI) and 23 (37.70%) among these had urosepsis. 54 patients had pneumonia. 29 patients developed aspiration pneumonitis. (Others with infections were 10 admitted with acute gastroenteritis, 8 patients had empyema, 8 patients had infected bed sores, 3 had sputum positive pulmonary tuberculosis, 1 patient had infected gangrene of hand, 1 had septic arthritis involving knee, 2 patients had tubercular meningitis, 2 developed hospital acquired pneumonia, 1 had acute meningoencephalitis and 1

had acute bacterial meningitis, 2 persons had cholangitis, 1 had abscess involving occipital area and cerebellum, 1 had orbital cellulitis, 2 had cellulitis involving thigh, 1 had pyelonephritis and pyoderma in 2, acute pancreatitis, viral syndrome).

Azotemia was seen in 51 patients. 46 patients had underlying chronic kidney disease.

Shock due to different reasons was present in 42 patients (pulmonary thromboembolism was the cause in 2, steroid withdrawal in 1, hypopituitarism in 1 and cardiogenic in 4).

45 had underlying Chronic obstructive lung disease, 29 were admitted with acute exacerbation of whom 19 had type 2 respiratory failure with hypercapnia.

10 patients had cor pulmonale, 20 had hypertensive cardiovascular disease and 7 had dilated cardiomyopathy. 16 were admitted with congestive cardiac failure and 5 had left ventricular failure. 2 had pericardial effusion.

31 patients were admitted with myocardial infarction (MI) (19 had anterior wall MI, 12 inferior wall MI, 11 non ST elevation MI, 3 old NSTEMI, 2 had ventricular tachycardia, PSVT, trifascicular block, symptomatic bradycardia.). 14 had atrial fibrillation and 5 were admitted with fast ventricular rate. 15 were admitted with complete heart block. 6 had documented coronary artery disease and 3 had rheumatic heart disease. 3 AV dissociation, second degree block in 1, 2:1 block in 1, symptomatic VPCs in 1, post operative cardiac arrest in 3 and post cardiopulmonary resuscitation survival 5.

Haemorrhagic stroke admissions were 24 (13 thalamic, 5 frontal or parietal lobar, 2 putamenal, 1 brainstem, 1 basal ganglionic and 1 acute SDH 1 subarachnoid), intraventricular extension of haemorrhage was present in 9. 16 had old stroke before admission. An infarct in brain (including lacunar) was seen in 15. 5 were admitted with cardioembolic stroke.

19 patients were hypothyroid. 16 of diabetic patients were admitted with uncontrolled sugars with 3 having diabetic ketoacidosis and 4 having hyperglycaemic hyperosmolar state. 10 were admitted with hypoglycaemia. Empty sella with hypopituitarism was present in 3, 3 had diabetic foot and 5 were obese as per body mass index.

13 patients had malignancy (1 recovered multiple myeloma, 4 carcinoma lung, 2 stomach carcinoma, 1 esophageal, 1 prostate and bladder, 1 renal cell and 3 breast).

Polypharmacy (that is using equal to or more than 5 medicines) was present in 13.

12 patients were admitted with seizures. 9 had underlying Parkinson's disease and 3 had Parkinson's Plus. Underlying psychiatric disease was present in 10 with depression in 7. Normal pressure hydrocephalus in 5, 2 were admitted with neurolept malignant syndrome. 8 had subdural haemorrhage (past or present). Baseline dementia was present in 15 with Alzheimer's in 3. Other neurologic problems were anomic aphasia, toxic encephalopathy, brain metastases, granulomas in brain, cryptococcal meningitis, multiple cranial nerve palsies (likely acute disseminated encephalomyelitis (ADEM)). 2 had documented acute inflammatory demyelinating polyradiculoneuropathy, 1 had Wernicke's encephalopathy and 2 had acute viral encephalitis.

Hyperkalemia was documented in 8 and metabolic acidosis in 8, hyponatremia in 7, hypokalemia in 3, 3 had hypercalcemia. 11 had severe anemia and 3 had pancytopenia, 1 had myelodysplasia syndrome.

Chronic liver disease was present in 9 with complications in 2.

Deep vein thrombosis was documented in 4. Arterial thrombosis in 3 involving popliteal or femoral artery. Obstructive sleep apnea was documented in 2.

7 patients were on anticoagulants and 2 admitted with coagulopathy.

Fibrotic lung disease (including idiopathic pulmonary fibrosis and interstitial lung disease) was present in 4. Pleural effusion in 8, pneumothorax in 1 and 2 were admitted with haemoptysis.

13 patients were bed ridden, 3 had osteoporosis, 4 rheumatoid arthritis, trochanteric fracture of femur was present in 6 and vertebral fracture in 3.

5 were admitted with upper gastrointestinal bleeding with majority having peptic ulceration.

6 had benign prostatic hyperplasia and 2 were admitted with gross haematuria.

2 had acute hepatitis E, 1 was hepatitis B positive and 1 had hepatitis C, 4 had hepatic encephalopathy and 1 had hepatorenal syndrome.

Cholelithiasis was documented in 3, 1 developed GB perforation, 5 were already cholecystectomised in past.

1 had acyclovir induced leukopenia and other developed pregangrene in right arm due to extravasation of parenteral medication.

Commonest presenting complaint was cough with expectoration followed by urinary incontinence and feeling breathless. However, most patients presented with non specific symptoms in the form of worsening of sensorium, either aggressiveness or sluggishness of behaviour noticed by family members, talking irrelevant or increasing fatigability. Many complaints were attributed to psychiatric disease by family members and patients were many a times taken to a psychiatrist before coming to internists. Many patients came with oversedation due to intake of sedatives on top of the polypharmacy. Age related changes in pharmacodynamics and kinetics make geriatric population susceptible to such drug related illnesses. Urinary incontinence was seen in 24 % patients at baseline (at home before present illness). 15 patients were on treatment and were labelled as dementic. In addition, almost 30 more patients had a minimal baseline cognitive impairment on admission. Poor vision also attributed to falls and fractures in our patients.

Out of 299 discharged patients, only 89 patients were independently ambulatory, whereas 210 patients needed support for ambulation or were totally bed ridden. Most of our discharged patients could not return to their prehospital functional status.

The most common cause of death in our patients was infection (74%) followed by cardiovascular accidents including haemorrhagic stroke(16.86%) and myocardial

infarction(15%). This was followed by COPD acute exacerbations with respiratory failure(12%). Multiorgan failure, azotemia with hyperkalemia and metabolic acidosis occurred in many patients terminally and most died of arrhythmias.

As per gender distribution among mortalities, 44/101(43.56%) were females and 57/101(56.43%) were males. Thus in our case, more males than females died.

## DISCUSSION

The increasing proportion of the very elderly having a larger burden of chronic disabilities and illnesses can place increasing demands on our healthcare system. Elderly patients with infections commonly present with cognitive impairment or a change in mental status and even frank delirium can occur in 50 percent of older adults with infections [22]. The elderly sick patients are likely to under-report and hence present in a more advanced stage of illness. Moreover, hospitalization may be seen as a transit to death by many [23], who often decline hospital admission and present late [24], [25]. Studies have shown that higher proportion of elderly admissions to the medical wards are males (69.8–74.6%) [26],[27],[28].

As per Charles P Mouton et al, infectious diseases account for one third of all deaths in people 65 years and older [29]. A data from United States showed that between 1980 and 1992, the infectious disease mortality rate in patients 65 years and older actually rose 25 percent [30]. That comparative mortality rate was nine times that in patients between 25 and 44 years of age [30]. In case of UTIs, polymicrobial infections occur in about 30 percent of patients especially if the UTI is related to the use of a catheter[31].

With polypharmacy in elderly, the incidence of adverse drug reactions is more prevalent. If medication-related problems were considered as a disease, adverse effects would be the fifth leading cause of death in the United States.[32]. In a study in Ireland reported in the Journal of Parkinson's Disease, it was found that the five leading reasons for hospital admission of Parkinson disease patients are urinary tract infections followed by pneumonia, lower respiratory tract infections, aspiration pneumonia and femur fracture [33].

As shown in BMC (BioMed Central), Geriatric series, the most frequent causes for hospital admission were the chronic complications of diabetes (42.1 %), followed by hyperglycemia (26.4 %) and infection (15.7 %). Acute diabetic complications were more commonly seen in females than males, and diabetic nephropathy and neoplasms were more frequently found in men than women. The main infections involved the respiratory tract (44.5 %), urinary tract (20.3 %), gastrointestinal (14.8 %), and skin and soft tissue (10.9 %). Respiratory tract infection was significantly more common in men (61.4 % vs 31% in women), whereas urinary tract infection was more frequent in women (29.6 % vs 8.8 % in men)[34].

A study conducted by Sanya *et al* [26] reported the average length of stay as 18.5 (4.1) days for those who survived and 10.4(8.8) days for those who died during hospitalization. Belayachi *et al* [35] have reported an average length of stay of

6.9 ± 4.9 days among survivors and 6.3 (7.3) days among those who died during hospitalization.

As compared to young adults, the mortality rate is higher among elderly patients in the hospital medical wards in many studies [26],[36] commonly due to complications or acute exacerbation of chronic morbidities [35]. Many studies have shown elderly males having higher mortality than females [37] As per AHA 2011, the leading cause of death in those older than 65 years is heart disease, presenting challenges in diagnosis and treatment [38].

A greater than two-fold increased rate of cognitive decline has been observed in survivors of hospitalization for diverse diagnoses including pneumonia, myocardial infarction, or strokes [39],[40],[41]. Many prospective, large, community-based studies have also shown hypertension [42],[43] or hypotension [44], diabetes mellitus [43],[45],[46], and severe COPD with hypoxia [47],[48] to be associated with future worsening cognitive impairment.

## CONCLUSION

There is a need for information regarding the characteristics of admissions of elderly people to help in planning health services for the same and it is our moral duty to care for the elderly as we do for young adults.

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