

Elderly people at the Emergency Department: Study from a District Hospital in Bangladesh

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Abstract

Background: The proportion of elderly population is increasing globally. Very little information is available on the presentation and clinical outcome of elderly patients at the Emergency Department (ED) in Bangladesh. This study was carried out to assess the pattern of elderly patients (65 years and more) who visited the ED of 250 Bedded General Hospital, Pabna (GHP).

Methods: A retrospective observational study was conducted on patients aged 65 years or more at GHP from 2017 through 2021. Patients' demographic information, symptoms, diagnoses and outcome following attendance were studied. Statistical analyses were done using SPSS version 23.

Results: 20.7% (n = 94,905) of all adults (n = 4,57,549) presenting to the ED were aged $\geq$ 65 years. A greater number of elderly patients (58%) required hospitalization than non-elderly adults (37%). The 3 most common symptoms were breathlessness (9.9%), dizziness (9.0%) and abdominal pain (5.3%). The symptoms were mainly acute (< 24 hours, 42%) or less than a week (28.9%). The 3 most common diagnoses were Respiratory tract infections (7.8%), Cerebro-vascular diseases (Stroke/Transient ischaemic attack, 7.6%) and heart failure (7.4%).

Conclusion: Elderly people constituted 20.7% of emergency attendance but 32.5% of admissions in adults. They differ significantly from younger adults in presentation and outcome. A better understanding of this issue will help doctors at the ED provide better management.

Introduction

Elderly population is a growing demographic and an important concern in the healthcare system worldwide. According to the United Nations report, the pace of aging of the world population has increased, and the growth of elderly populations will be faster in Asia than in other regions between 1980 and 2050¹. Elderly patients are more likely to be admitted to the hospital than younger patients². Moreover, these patients are likely to undergo additional diagnostic tests and consultations, and have a longer hospital stay and higher admission rate from the ED^{3,4}. Elderly people account for approximately

12.0-21.0% of all ED visits^{5,6}. In a study from USA, compared to younger patients, the elderly were 4.4 times more likely to use ambulance service, 5.6 times more likely to be admitted to a hospital, and 5.5 times more likely to be admitted to ICUs⁷.

In Bangladesh, improved social conditions and advances in public health during the last half century have contributed to a significant increase in the average lifespan; life expectancy at birth has improved to 72.8 years (74.5 years in women and 71.2 years in men⁸). With one of the highest population densities (1,140/ sq. km) in the world, and with 14 million people aged 60 years and older (8.3% of total

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population), this country needs to assess the health needs of geriatric patients and to formulate an action plan thereafter. In doing so it is vital to have a clear knowledge on their demographic and clinical characteristics. But very little information is available on the prevalence and clinical outcome of elderly patients in the emergency department since little research has been carried out in this area.

The special health care needs of elderly patients utilizing emergency services have been clearly demonstrated in different studies abroad⁹⁻¹⁵. The present ED care models in Bangladesh need to be modified to such an extent that we may be able to cope with the geriatric population who are tend to get sick more often along with multiple co morbidities⁹.

The present study aimed to obtain a critical understanding of the clinical presentation of the elderly people with different features for better planning of emergency care. Four research questions were addressed: (a) What are the most frequent presenting complaints among elderly individuals presenting to the ED? (b) What are the differences in the complaints made by the elderly individuals among the sub-age groups? (c) What are the most common clinical diagnoses among elderly individuals presenting to the ED? (b) What are the differences in diagnoses among the sub-age groups?

Materials and Methods

This retrospective observational study was conducted in the Emergency Department (ED) of 250 Bedded General Hospital, Pabna (GHP), Bangladesh. GHP is a District hospital, having been serving as a Medical College Hospital (tertiary care teaching hospital) with a catchment area exceeding three million inhabitants and an annual ED visit of approximately 90,000 patients and a 37% admission rate. The hospital ED also provides both primary and specialist care 24/7 within the district with a population of 2.6 million.

The initial data included ED visits by 96,803 individuals aged e" 65 years during a five-year study period (January 2017 to December 2021). Cases with missing information on age, sex and/ or presenting symptoms (n=1,898, 1.96%) were excluded, and the final data included 94,905 ED visits by the elderly. Both manual and electronic record systems to extract data on demographic and clinical characteristics of patients were used. Information on age, sex, time of

arrival (work shift), presenting complaints (only the three most significant symptoms), duration of symptoms, level of consciousness, vital signs, and disposition from the ED were collected and recorded.

Patients were classified as dead on arrival (DOA) if they arrived in the ED with cardiac arrest and did not recover despite resuscitative attempts as per BLS/ ACLS guidelines. Those transferred to another (higher) facility due to non-availability of high-dependency beds, financial constrains or on their will, were termed "Referred". Data available on 94,905 patients aged 65 years and more were processed and prepared for analysis. The study population was categorized into three age groups: young-old group (65 to 74 years), middle-old group (75 to 84 years), and old-old group (85 years and above); and the data were compared among the groups.

Statistical analysis was done with Statistical Package for Social Sciences (SPSS) version 23.0. Descriptive statistics were used for the demographic variables and the characteristics of the ED visits. The 10 most common CCs on ED visits and 10 most common diagnoses were analyzed separately based on age groups.

The study was reviewed and approved by the Ethical Review Committee of 250 Bedded General Hospital, Pabna, Bangladesh.

Results

A total of 457,549 ED visits by patients aged e" 18 years were documented during the study period, among which 94,905 (20.7%) were by those e" 65 years. An increasing trend in the number of ED visits by the elderly was observed over time (Figure 1).

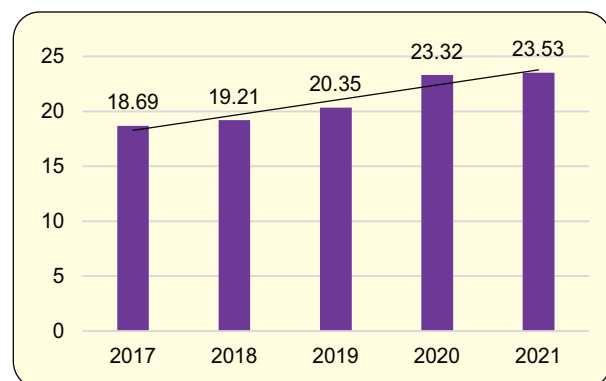


Figure 1: Trends of visit of Elderly people at ED

Table 1. Basic demographic characteristics of patients

	18-64 years (n=362,644)	≥ 65 years (n=94,905)
Gender		
Male	51.3%	45.6%
Female	48.7%	54.4%
Disposition		
Sent home	56.2%	24.8%
Admitted	31.5%	58.0%

The number of elderly female patients (54.4%) was greater than the number of male ones (45.6%), and the female: male ratio was found to be highest (1.7: 1) in the old-old group. More than half (55.6%) of the ED attendees were from the young-old group. 90.7% of the sample were alert at the time of ED visit, but this number was greatly reduced in the old-old group (79.3%).

Table II: Basic demographic characteristics of elderly patients attending ED

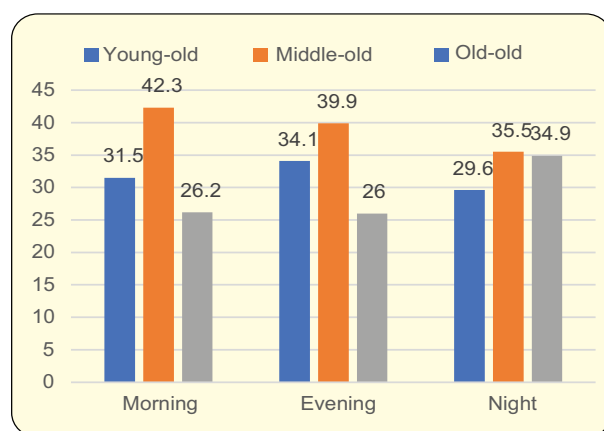
	Young-old (n=52,814)	Middle-old (n=36,8471)	Old-old (n=5,220)	Total (n=94,905)
Male	46.9%	44.8%	37.8%	45.6%
Female	53.1%	55.2%	62.2%	54.4%
Total	55.6%	38.9%	5.5%	100%

Table III: Level of consciousness of elderly patients attending ED

	Young-old(%)	Middle-old(%)	Old-old(%)	Total(%)
Alert	93.0	88.9	79.3	90.7
RTV	3.1	4.1	6.8	3.7
RTP	2.4	3.0	5.9	2.8
NR	1.5	4.0	8.0	2.8

Note: RTV- Response to voice, RTP- Response to pain, NR- No response

Most of the ED visits took place in the morning and evening shifts among the young-old and middle-old groups while the largest number of the old-old group of patients (34.9%) used to visit ED during the night shift.

**Figure 2.** Shifts of ED visits by the elderly

Most of the patients (42%) presented with acute symptoms lasting for less than 24 hours.

Table IV : Duration of symptoms

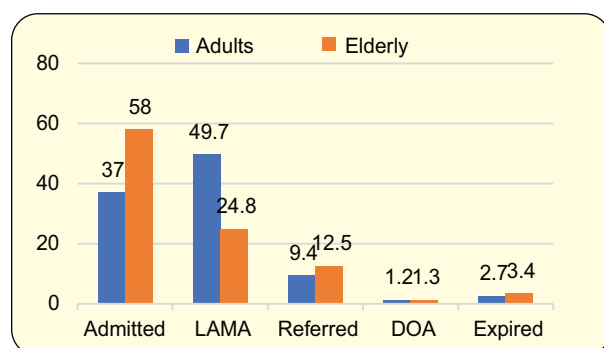
	Young-old (n=52,814)	Middle-old (n=36,8471)	Old-old (n=5,220)	Total (n=94,905)
<24 hours	42.5	41.6	39.8	42.0
1-7 days	29.1	28.5	30.3	28.9
1-4 weeks	16.9	15.5	13.5	16.1
>1 month	7.9	6.4	6.6	7.3
Other	3.7	8.0	9.8	5.7

The 10 most common presenting symptoms (chief complaints, CCs) were analyzed separately for each age group. While dizziness was the most predominant symptom (11.1%) in the young-old group, dyspnoea topped (9.9%) the overall list, followed by dizziness, abdominal pain, fever, chest pain, dysuria, cough, headache, vomiting, and syncope. The presentation of dyspnoea as a CC was noticed to be increasing along with an increase in age. Fall and disorientation were common CCs amongst the old-old age-group. The 10 commonest CCs combined 47.8% of the presenting complaints of ED visits.

Table V: Most common symptoms in admitted patients aged ≥ 65 years

Young old (29,951)			Middle old (21,536)			Old old (3,558)			Total (55,045)
1	Dizziness	11.1	Dyspnoea	12.5	Dyspnoea	13.8	Dyspnoea	9.9	
2	Dyspnoea	7.6	Fever	8.3	Dizziness	8.7	Dizziness	9.0	
3	Abd pain	5.8	Dizziness	6.2	Abd pain	7.8	Abd pain	5.3	
4	Fever	5.5	Abd pain	4.1	Fever	5.5	Fever	4.9	
5	Chest pain	5.3	Cough	3.9	Dysuria	3.2	Chest pain	4.5	
6	Headache	3.6	Chest pain	3.8	Syncope	2.3	Dysuria	3.4	
7	Dysuria	3.3	Dysuria	3.5	Headache	2.0	Cough	3.2	
8	Cough	2.9	Vomiting	3.3	Cough	1.9	Headache	2.9	
9	Vomiting	2.2	Syncope	2.7	Fall	1.8	Vomiting	2.6	
10	Arthritis	2.0	Asthenia	2.6	Disorientation	1.8	Syncope	2.1	
Sum		49.3		50.9		48.8		47.8	

58% of the ED visits by the elderly resulted in the patients being admitted to an inpatient department. The proportion of admission in the elderly is more than 1.5-fold higher than that in the total adult population (37%) and almost twice the number of the patients in the 18 to 64-year age group (31.5%). Almost a quarter (24.8%) of the elderly individuals were sent home with advice and 12.5% of the attendees referred to other (higher) facilities for better management (Figure 2).

**Figure 3.** Disposal from ED

Of the 94,905 patients, 55,045 (58%) were admitted to hospital. Of those admitted, 53.4% were females and 46.6% males. Female patients (64.5%) greatly outnumbered their male counterparts (35.5%) in the old-old group. Majority (54.4%) of the patients admitted in ED were from the young-old group. While 86.6% of the individuals were alert on admission, this proportion was much less in the old-old group (79.3%), amongst whom 1 in 10 had no response to voice or pain.

Table VI: Basic demographic characteristics of elderly patients admitted from ED

	Young-old (n=29,951)	Middle-old (n=21,536)	Old-old (n=3,558)	Total (n=55,045)
Male	48.8%	45.4%	35.5%	46.6%
Female	51.2%	54.6%	64.5%	53.4%
Total	54.4%	39.1%	6.5%	100%

Table VII: Level of consciousness of elderly patients admitted from ED

	Young-old(%)	Middle-old(%)	Old-old(%)	Total(%)
Alert	89.5	84.6	73.8	86.6
RTV	4.6	4.9	8.2	4.9
RTP	3.6	4.4	7.5	4.2
NR	2.3	6.1	10.5	4.3

Note: RTV- Response to voice, RTP- Response to pain, NR- No response

Table VI: Basic demographic characteristics of elderly patients admitted from ED

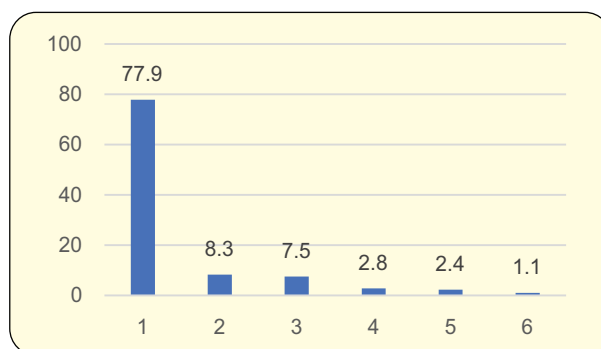
	Young-old (n=29,951)	Middle-old (n=21,536)	Old-old (n=3,558)	Total (n=55,045)
Male	48.8%	45.4%	35.5%	46.6%
Female	51.2%	54.6%	64.5%	53.4%
Total	54.4%	39.1%	6.5%	100%

Table VII: Level of consciousness of elderly patients admitted from ED

	Young-old (%)	Middle-old (%)	Old-old (%)	Total (%)
Alert	89.5	84.6	73.8	86.6
RTV	4.6	4.9	8.2	4.9
RTP	3.6	4.4	7.5	4.2
NR	2.3	6.1	10.5	4.3

Note: RTV- Response to voice, RTP- Response to pain, NR- No response

As there was neither an Intensive Care Unit (ICU), nor a Department of Geriatric Medicine in the hospital, more than three fourths (77.9%) of the patients were admitted to Medicine Department (1), followed by 8.3% in General Surgery (2), 7.5% in Cardiology (3), 2.8% in Gynaecology (4), 2.4% in Orthopaedic Surgery (5), and 1.1% in other Departments (6).

**Figure 4.** Distribution of patients in Departments

Among the admitted patients, the 10 most common clinical diagnoses were analyzed separately for each age group. Respiratory tract infections (7.8%), cerebrovascular diseases (7.6%), and heart failure (7.4%) were the table-toppers, followed by obstructive airway diseases (COPD/ bronchial asthma), acute gastroenteritis, acute coronary syndrome (ACS), urinary tract infections, sepsis, diabetic complications, and pyrexia of unknown origin (PUO). The occurrence of RTI and HF were frequently observed in middle-old and old-old age groups. Sepsis was a diagnosis more commonly found amongst the old-old age group. The 10 commonest diagnoses represented 55% of the total disease profile.

Table VIII: Most common diagnoses in admitted patients aged ≥65 years

	Young old (29,951)		Middle old (21,536)		Old old (3,558)		Total (55,045)	
1	Stroke/TIA	8.2	RTI	9.9	HF	9.4	RTI	7.8
2	COPD/BA	7.4	HF	8.1	Stroke/TIA	8.9	Stroke/TIA	7.6
3	HF	6.7	Stroke/TIA	6.9	RTI	8.8	HF	7.4
4	RTI	6.2	AGE	5.9	Sepsis	7.7	COPD/BA	6.6
5	ACS	6.0	COPD/BA	5.8	ACS	6.5	AGE	5.8
6	AGE	5.9	ACS	5.3	AGE	4.8	ACS	5.7
7	UTI	4.4	UTI	4.7	COPD/BA	4.7	UTI	4.5
8	Sepsis	3.9	DM comp	3.6	UTI	4.4	Sepsis	3.6
9	PUO	3.2	Sepsis	2.6	Cellulitis	2.8	DM comp	3.2
10	DM plus	3.0	Malignancy	2.5	Malignancy	2.4	PUO	2.8
Sum		54.9		55.3		60.4		55.0

Discussion

Our study depicts the patterns of ED visits by elderly individuals compared to young adults of a tertiary care teaching hospital in Bangladesh. The study compared the variability of presentation among the three age-groups of the senior citizens. The ED is a major portal of entry of the elderly into the hospital and is often their first contact with the medical services¹⁶. 20.7% of the adult patients visiting the ED were ≥ 65 years old while these older individuals constitute only 8.3% of the general population. (HB 2020) Similar results were shown in the studies from Pakistan and Taiwan¹⁷⁻¹⁹. (B, B 11, B 21) Such disproportionate usage of the health system by the elderly is supported by some studies in western countries as well^{7,10,19-21}.

Though the elderly constituted only 20.7% of the ED attendance in adults, they contributed to 32.5% of the total admission. This picture is consistent with the scenario reported in South Asian, Far East, and the Western literature^{10,11,17,22}. An increasing trend in the elderly patients' ED visits over the years was found which is similar to the findings in a study in Pakistan¹⁷.

The number of elderly females (54.4%) was greater than that of the males (45.6%), and the female: male ratio was found to be highest (1.7: 1) in the old-old group. Majority (55.6%) of the ED attendees were from the young-old group. More than 90% of the sample were alert while visiting ED, but this number was greatly reduced to $< 80\%$ in the old-old group. All these findings are consistent with that reported in a South Korean literature²³.

Vast majority of the older individuals visited in the morning and evening shifts while the old-old group of patients used to visit ED during the night shift. Similar results were observed in the studies from Pakistan and South Korea^{17,23}.

More than two thirds of the patients presented with acute symptoms lasting for less than 24 hours, which contradicts with the finding in a Korean study showing $> 90\%$ acute symptoms²³. This may be explained with the fact that ours is a lower-middle income country with most of the people have low level of education and little health awareness resulting in delayed arrival to hospital.

The most common presenting symptoms at the ED was difficulty in breathing or shortness of breath. It is a common symptom found in respiratory tract

infections, heart failure, ischaemic heart disease and obstructive airway disease. The presentation of dyspnoea as a CC was found to be increasing with increasing age. Fall and disorientation were more commonly encountered amongst the old-old patients. Identical findings were observed in reports from Singapore, South Korea and Australia²²⁻²⁴. Falls are often the symptom of underlying silent and underdiagnosed conditions, therefore should not be taken lightly without proper assessment²².

The elderly individuals aged ≥ 65 years attending ED were 1.8 times more likely to be admitted compared to the non-elderly adults (58% versus 31.5%). Fayyaz et al. had the similar finding but Lim et al. had reported differently (57.3% vs 15.5%)^{17,22}.

The most common diagnoses were related to cardio-respiratory disorders and infections. Schwartz et al and Ettinger et al also noticed that elderly patients have a higher proportion of cardiac and pulmonary diseases^{11,25}.

Only 1.2% of the elderly were dead on arrival, and a further 3.4% breathed their last in the ED. This is a rather interesting observation in the context of our resource-poor setting. This may be explained by the fact that a large number of patients (12.5%) were transferred (referred) to higher centres due to non-availability of HDU and ICU in the hospital.

Elderly individuals are at greater risk of medical complications and functional decline after an ED visit. Evidence shows that the current disease-oriented and episodic models of emergency care do not adequately address the complex care needs of elders who visit the ED²⁶. Emergency care in elderly people should consider the unique factors that may differ them from younger people, including the complex and atypical presentations of symptoms, cognitive impairment, comorbid conditions, screening for polypharmacy, need for tailored diagnostic tests, decreased functional reserve, need for psychosocial/community support, and baseline functional status²⁷.

With an increase in the need for ED care among elderly individuals, it is vital for ED staff to receive geriatric emergency training and administer appropriate and tailored care. Evidence shows that EDs staffed with geriatric professionals may be effective in preventing the unnecessary admission of elderly visitors²⁸.

Limitation

The present study represents a small fraction of the total scenario. We obtained information from the registry data (bed-head tickets of the patients) where complete clinical records were not available, and which may include multiple visits by the same person. Information on comorbidities, investigation reports, medications and multiple diagnoses could not be ascertained in this study design. The clinical features and diagnoses were not analyzed separately based on disease- or injury-related presentation and gender. Further research in different levels of health care facilities is, therefore, needed to have a clear understanding of the issues in managing geriatric population.

Conclusion:

The health care needs of the elderly population significantly differ from those of the younger adults. The elderly individuals often have multiple and complex pathologies and atypical presentations leading to disproportionately higher admission rates and more resource utilization. A better understanding of the common presenting symptoms and diagnoses would help our health care professionals to provide proper service through a dedicated geriatric care unit in ED.

Conflict of interest:

The authors declare no potential conflict of interest.

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