Demographic and Socio-Eeconomic Characteristics of Patients with Congestive Heart failure Presenting to the Cardiac Emergency of Bangabandhu Sheikh Mujib Medical University

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Abstract:

Background: Repeated hospital readmissions are frequent and increasing over time in patients with heart failure (HF). The readmission rate within 3-6 months after discharge in these patients is 10-50%.

Aim and Objective: This study was conducted to find out the demographic and socioeconomic factors contributing to readmission of patients with congestive heart failure admitted in university cardiac center of Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh during last quarter of 2016 and early quarter of 2017.

Material and method: This was observational descriptive cross sectional study and enrolled 102 patients were enrolled for the study. Complete medical records were reviewed carefully. Results:A total of 68 men and 34 women with a mean (±SD) age of 55 (±14) years constitute the study population. Most of the population (42%) who belongs to age group 51-60 years had readmissions (p <0.0004). De-motivation due to negative comments from surrounding causing fully or partially drugs discontinuation (P <0.008) and poor adherence to drug (P <0.004) were associated with readmissions.

Conclusion: After proper addressing of possible all medical factors and co morbidities, optimizing education strategies in a manner to respect the patients' level of understanding; emphasizing the importance of medication adherence, diet and life style modification, increasing the self-monitoring skills as well as supporting the spouse and family members are considered as effective measures to reduce readmission rate due to congestive heart failure.

Keywords: Congestive heart failure, Socio- economic status(SES), Emergency department,Bangabandhu Sheikh Mujib Medical University(BSMMU).

Introduction:

At the end of twentieth century, the mortality from cardiovascular diseases allocated nearly half of the statistics of mortality in industrial and a quarter of fatalities in developing countries. Among these diseases is "congestive heart failure (CHF)" which is a very important part of cardiovascular diseases and almost all heart diseases can lead to this syndrome.[1] CHF is a debilitating complaint associated with a large number of readmissions.[2] A large body of research has revealed that CHF-related rehospitalization within six months is around 25–30%, which can increase to 40% within 1 year.[3] Another study showed the readmission from CHF range from 27% to 47% within three to six months after initial discharge.[4] One of the study in USA showed, annual readmission rate was 56.6%, median time to

readmission was 91 days, with 18.3% patients readmitted within 1 month after discharge.Unplanned hospital readmission is a devastating experience for patients and is costly for society. As CHF is one of the non communicable disease causing significant mortality, morbidity, impairment of quality of life in not only developed countries but also in developing and under developed countries. Theses readmissions are affected by medical, demographic, socio environmentalfactors and are supported by various country wise studies.

Besides medical factors, other previous studies had documented that the Socio-economic Status (SES) of CHF patients was a crucial indicator, which might influence the patient's behavioral pattern, environmental exposures, and access to healthcare services.[5] There is little evidence in southEast Asian countries

includingBangladesh about the association of SES and readmission due to CHF. Investigations carried out in the United States have suggested that most early readmissions are due to behavioral factors that are open to influence mainly inappropriate drug treatment or failure to comply with dietary measures.[6] It is assumed that the result of this first study could contribute to providing the evidences for better understanding of association of socio-economical characteristics and readmission due to CHF in Bangladeshi patients; also it is probable that it would be useful for other developing countries with similar circumstance to Bangladesh.

Material and methods:

This research is a descriptive observational study. One hundred and two women and men with congestive heart failure in university cardiac center of Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka, Bangladesh during last quarter of 2016 and early quarter of 2017 were selected with purposive sampling method.Consecutive admissions were screened daily to identify eligible patients who have arrived in cardiac emergency room; Department of Cardiology required to have an admission diagnosis of congestive heart failureandwas enrolled in this study on the basis of inclusion and exclusion criteria with history of at least one well documented hospitalization for congestive heart failure.All essential data on the patients were recorded in a designed checklist. Data were collected through a face-to-face interview with the patients and their attendants and from patients' hospital files classified into three categories including demographic information, potential confounding variables, and information about the patients' SES.

Statistical analysis:

All the data was checked and edited after collection. Continuous variable was expressed as Mean ± Standard Deviation. Categorical variable was presented by frequency, percentage and graph. Chi-square test was used to see the association between socio-environmental factors and readmission where P value of < 0.05 was considered statistically significant. Statistical analysis was done using SPSS (Statistical package for social sciences) with version 23 software programme.

Results:

The final total 102 patients with congestive heart failure were included. Table 1: showing 68 (67%) men and 34 (33%) women with a mean (±Standard Deviation) of subjects' age was 55 (±14) years constitute the study population. Most of the population (42%) belong to age group 51-60 years (Age ranging from 18-80+ years) had readmissions (P <0.0004) (Fig.1). Almost all of them (98%)were married.Most of the (55%) population came from village and upazilla area, 41% were from city areas and rest 4% from district. Majority population (59%) was illiterate or has primary level education (Table. 1).Half of the population (50%) was retired and only 29% were continuing their job. About two third of population (62%) were from middle class income group (11500-200000Tk) and there was total absence from upper income group. 62.7% were currently or former smoker (Table.2).Among 102 population, 39 (38%) had history of single hospitalization within last year of index hospitalization. 18% population had four or more hospitalization within last year of index hospitalization. Nineteen and sixteen percent population had two and three hospitalization within last year of index hospitalization respectively. De-motivation due to negative comments from surrounding causingfully or partially drug discontinuation was present in 38.2% population (P <0.008).

Table 1

Socio-demographic parameters of the study patients (n=102).

| Socio-demographic parameters	Distribution	Frequency (n=102)	Percentage (%)
Age (Mean ± SD) Years			55±14
Gender	Male	68	66.7
	Female	34	33.3
Marital status	Married	100	98
	Single	02	02
Area of residence	Village	31	30.4
	Upazilla	25	24.5
	District	4	3.9
	City	42	41.2
Educational status	No education	20	19.6
	Primary	32	31.4
	High school	28	27.5
	Graduation	22	21.6

%= Percentage of frequency in each group
n= Number of subjects
SD= Standard Deviation

Significant percent (63%) population had family caregiver. During hospitalization, 67% population got full family help during staying at home. Large percent (73%) of population had partial adherence to dietand 56% had no adherence to advised lifestyle. Fig. 2 showing significant number of patients (76%) had partial or non-adherence to drugs (P <0.004). Huge percent (91%) of population was not immunized against influenza/ pneumococcus. 68% and 59% did not get "Self care management" education and discharge plan of last hospitalization respectively. Thirty

one percent populations had no routine OPD follow up visit within last six months of index hospitalization (Table.3). Almost all (98%) had co-morbidities which significantly influenced the disease outcome. The mean value of BMI (±SD) of the study subject was 23.72±4.63 and 33.2% were obese, 15% were overweight, 13% were underweight.
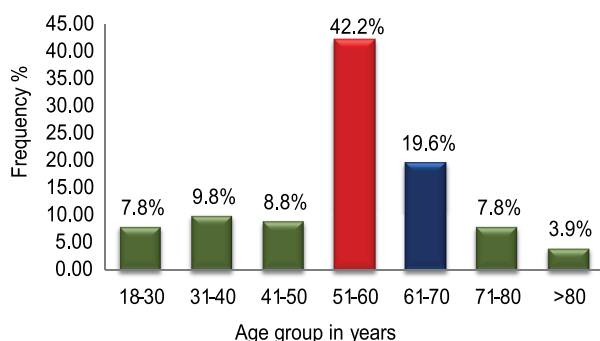
Fig.-1: *Bar Diagram showing age distribution of study population (n=102)*
%= Percentage of frequency in each group
n= Number of subjects

Table-II
Socio-environmental parameters of the study population (n=102)

| Socio-environmental parameters	Distribution	Frequency (N=102)	Percentage (%)
Income level of family	Lower class <11500TK/Month	39	38.2
	Middle class 11500-200000TK/Month	63	61.8
	Upper class > 200000TK/Month	00	00
Smoking status	Never	38	37.3
	Current	29	28.4
	Former	35	34.3
Alcohol status	Never	91	89.2
	Current	2	2.0
	Former	9	8.8
Other addictions	No	80	78.4
	yes	22	21.6
Living alone	No	98	96.1
	Yes	4	3.9
Family caregiver	No	11	10.8
	Yes	64	62.7
	Partial	27	26.5
Family help during hospitalization	No	7	6.9
	Yes	68	66.7
	Partial	27	26.5

%= Percentage of frequency in each group
n= Number of subjects

Table-III
Medical advice adherence parameters of the study population (n=102)

Socio-adherence parameters	Distribution	Frequency (n=102)	Percentage (%)
Adherence to diet	No	15	14.7
	Yes	28	27.5
	Partial	59	57.8
Adherence to lifestyle	No	57	55.9
	Yes	12	11.8
	Partial	33	32.4
Immunization against influenza/ pneumococcus	No	93	91.2
	Yes	9	8.8
Education on "Self care management"	No	69	67.6
	Yes	3	2.9
	Partial	30	29.4
Discharge plan delivered	No	59	57.8
	Yes	16	15.7
	Partial	27	26.5
Outpatient F/U in last 6 months	No	32	31.4
	Yes	70	68.6

%= Percentage of frequency in each group
n= Number of subjects
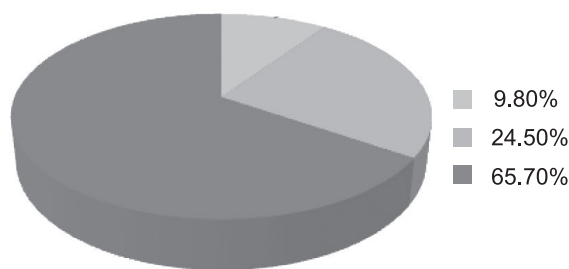
Fig.-2: *Pie chart showing the adherence to drug of the study population (n=102)*
%= Percentage of frequency in each group
n= Number of subjects

Discussion:
Patients with chronic congestive heart failure (CHF) required frequent rehospitalization because of the exacerbation of CHF. Previous studies examined risk factors for readmission to identify patients at high risk.

They found associations between advanced age, prior hospital admission, the severity of illness, and medical comorbidities with hospital readmission. The conducted study was robust considering other than medical factors including the characteristics of individual, demographic and socio-environmental factors on the hospital readmission of these patients.

Precipitating acute heart failure in the form of de novo or chronic congestive heart failure was more common in 51-60 years age group with the mean age (SD±) of the population was 55 ± 7 years.[7] In our study population 72% are in 51-70 years age group which is significant (p value <0.0004) when compared with the total number of admission as other study supporting these findings. Ourfinding is also different from other research survey which showed that older population suffered more from AHF.Several surveys on hospitalized AHFobserved that, the mean age (±SD) of population was 69 ± 12 years,[8] 80±10 years[9] and 75.4±9.9 years[10] indicating the tendency were more in older age group.Several studies foundin their study that the male participants weredominant which are almost similar to our findings.[7,8,11] According to the International Congestive Heart Failure (INTER-CHF) study, 46% hospitalized populations came from rural area, whereas 55% came from rural area (village and upazilla) area in our study.[12] Probably patients came to University Cardiac Center, BSMMU to get latest medical care which was not available in countryside.

Almost all of them 100 (98%) were married. Dokainish and Noori found 24% and 58% were single among readmission group, which are dissimilar with our study.[12,13] Readmission rate was more common 51% in population who had primary level education or no education at all.Tsuchihashi et al. showed that readmission within 12 months were high among illiterate or primary education level which is higher than our findings.[11]

Readmission rate in patients, who have low educational level, being higher, can be a result of their poor knowledge.[14] In this regard, aSwedish found that many patients have limited and little understanding and knowledge of their disease; despite that they claim the amount of information that they receive is sufficient.[15] Congestive heart failure patients need sufficient and up-to-date information in this area during their treatment and they need correct and proper use of several drugs. Raising patients' awareness seems essential by providing necessary continuous education proportionate to their level of literacy.

Bathaei et al. had found that 35% populations were retired but our finding is higher (51%) due to either physicaly unfit for severity of heart failure or an event occurred among the retired group.[16] Most of the patients (62%)belonged to middle income group (11500-200000Tk) family. Rest(38%) belonged to lower income group (<11500Tk) and none of them from upper income group (>200000Tk). Philbin et al. found that patients with lower income had frequent hospitalization. Generally, the income is introduced as a predictor factor of readmission in these patients[17]which is consistent with the results of this study. A review of previous studies on this topic shows that the congestive heart failure is one of the costly diseases for patients' families and health care system among chronic diseases. Considering the issue, low-income patients do not have financial power for timely follow-up of their treatment and they are compulsorily hospitalized, as the disease gets more serious. To prevent the phenomenon one should think of establishing patients' follow-up system and supporting them.[18] Among thepopulation, 62% population were current smoker and former smoker and 37.3% never smoked. Noori et al.found 55% were current smoker among readmission populationwhich was similar to our study.[14]

Most of thepopulation (89%) never drank alcohol and 78% had no other addiction. Only 4%of the population were living alone as per family bond and social culture in Bangladesh. Most of the population(62%) had family caregiver, 27% receivedpartial care but rest 11% had no family caregiver. Tsuchihashi et al. showed that most of the patient (80%) had caregiver service[11] which is similar with our study and 21% patient lived alone and also in another study, 21% population lived alone which is dissimilar with our study.[14] Above picture are in favor of sufficient nursing for the heart failure patient to reduce rehospitalization. So, adequate attention could be drawn to improve their particular patient care efficiency through interactive training or frequent group discussion. Among the populations, 38% were de-motivated forfull or partiallydrug discontinuation. In our social background, partial or total non adherence to drug was significantly influenced (p value <0.0008) by negative comments from family member or others when compared with the total number of admission. During acute hospitalization, 93% got full or partial help from family members or from others that is similar (91%) to the one of the study finding.[14]

In our study, 72% had partial or no adherence   to diet. Most of the population (76%) had partial or non-adherence to drugs and rest 25% had full adherence to

drugs.In Japan, one of study showed that 48% hospital readmission was lack of compliance with medical and dietary treatment.[19] Noori et al. had showed in their study that 69% patient had poor adherence to drug that is similar to our study result.[13] This is statistically significant (p <0.004) when compared with total number of readmission for heart failure. Seventy percent patients were poor adherent to diet that is also similar to our study result. Euro-Heart Failure Survey II, identified besides arrhythmia (32.5%), noncompliance of the drugs (31.8%) as the most common precipitating factors of Acute Decompensate Congestive Heart Failure (ADCHF) where as higher rate of non adherence of drug (76%) was found in our study is the main factor[20].Among the respondents, 56% population had no adherence to healthy lifestyle, 12% had full adherence and rest of 32% population had partial adherence to healthy lifestyle.

 Most of the population, (91%) were not immunized against influenza / pneumococcus during the course of heart failure which is highly recommended from various guidelines. As HF is inevitable consequence of some cardiac and non cardiac disease process and emerging non communicable chronic diseases in Bangladesh and similar other developing countries, "Self care management" strategies should be firmly applied like self care management in diabetes mellitus.[21] Majority of population (68%)did not get "Self care management" education in our study. Significant percentage of (59%)population did not get discharged plan in the last hospitalization but in the discharge phase of acute heart failure management, proper discharge instructions to patients and their attendants are strongly recommended.[22] It is disappointing that only 3% and 16% got "Self care management" education and discharged instructionsduring the last hospitalization respectively. Patients follow-up plans must be in place prior to discharge and clearly communicated to the primary care team; patient should be (i) reviewed by their general practitioner within 1 week of discharge; (ii) should be seen by the hospital cardiology team within 2 weeks of discharge if feasible.[23] But in our study 69% patientshad at least single out patient based routine follow-up within last 6 months.On the contrary, one of the studies done abroad showed that at the time of discharge, 65% of patients or families had received education on discharge planning.[11]

Among 102 patients, 38% had history of single hospitalization within last year of index hospitalization, 18% had four or more hospitalization within last year of index hospitalization,and 19% and 16% had two and three hospitalization within last year of index hospitalization respectively. Hasan et al. showed in the hospital readmission prediction model study that 38% population had no admission history, 25% had single time, 13% had twice, 7% had thrice, and 17% had four or more admission in last year from index hospitalization[14].

Conclusion:

Patients hospitalized with congestive heart failure have a high risk for readmission after discharge. The result of the this study showed that major socio-environmental factors increase the risk of readmission due to congestive heart failure alongside with medical and demographic factors. This study suggests that applying some plans in vulnerable groups and conducting some education interventions to optimize the patient's awareness of drug, diet, life style and some medical advice adherence would be useful in further decreasing readmission due to congestive heart failure.

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