Original Article

Community Section

Morbidity Pattern among Geriatric Population in a Rural Area of West Bengal: A Cross-sectional Study

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ABSTRACT

Introduction: Aging is associated with gradual accumulation of a wide variety of molecular and cellular damage resulting in different types of morbidities in geriatric population especially in rural areas in India where health infrastructure is insufficient.

Aim: To assess socio-demographic profile and morbidity pattern of geriatric population in Memari-I block of East Burdwan district, West Bengal.

Materials and Methods: A cross-sectional observational study was conducted among 436 rural geriatric population from October to December 2020 at Memari-I block in West Bengal and multistage proportionate population sampling was done. Data was collected through house-to-house survey by pretested predesigned structured schedule and data analysed with help of International Business Machines (IBM) Statistical Package for the Social Sciences (SPSS) version 16.0.

Results: Among the 436 study population, 263 (60.3%) were male and 272 (62.4%) were in the age group of 60-69 years. Out of total, 156 (35.7%) had pallor, 428 (98.2%) had Gastrointestinal (GI) and 403 (92.4%) had musculo-skeletal problems. Hypertension was found in 110 (41.8%) males and 124 (71.7%) females and diabetes were found in 30 (11.4%) males and 53 (30.6%) females. Diabetes and hypertension were significantly associated with age group (60-69 years), gender (female), Body Mass Index (BMI) (obese), and dependency on others.

Conclusion: Geriatric population from the Memari block suffer from multiple co-morbidities, predominantly musculoskeletal disorders, GI disorder, hypertension and ophthalmic disorders. A significant number of study population were underweight and belonged to lower socio-economic group. Diabetes and hypertension showed significant association with age group (60-69 years), gender (female), BMI (obese) and dependency on others.

INTRODUCTION

Ageing is a biological process and experienced as a sequence of complex changes across the life span of an individual [1]. At a biological level, ageing is associated with the gradual accumulation of a wide variety of molecular and cellular damage [2,3]. Over time, this damage leads to a gradual decrease in physiological reserves and a general decline in the capacity of the individual. Geriatrics is the branch of General Medicine concerned with clinical, preventive, medical and social aspects of illness in the elderly.

In 2014, the prevalence of acute morbidity increased from 30% in the age group 60-69 years to 37% for the 80-above age group. Further, it was marginally higher among women than men [4]. Common chronic ailments such as arthritis, hypertension, cataract and diabetes were more prevalent among women whereas ailments like asthma and heart disease were more prevalent in men [4]. A study conducted in Erode district in western part of Tamil Nadu found that the geriatric population predominantly suffer from arthritis (45.2%), neuritis (8.8%), diabetes (6.6%), bronchial asthma (5.2%), hemiplegia (3.7%), Acid Peptic Disorder (APD) (2.9%), lumber spondylosis (2.5%) [5].

Memari-I is a community development block that forms an administrative division in Bardhaman Sadar South subdivision of Purba Bardhaman District, West Bengal. As per the 2011 Census of India, Memari-I Block had a total population of 218,425 [6]. There were 110,712 (51%) males and 107,713 (49%) females. Near about 11% of the population belonged to geriatric age group and the geriatric population was 35,347 in 2018-19 financial year [7]. It is one of the largest community development blocks in West Bengal but has a limited data on geriatric morbidity. With this backdrop, the present study was undertaken to assess socio-demographic profile and morbidity pattern of rural geriatric population in Memari I block, East Burdwan, West Bengal.

MATERIALS AND METHODS

A community-based cross-sectional observational study was conducted in Memari-I Block which is south sub-division of Burdwan (East) District, West Bengal. House-to-house visit was conducted from October to December 2020 among the population aged 60 years and above. Before starting data collection ethical approval from Institutional Ethics Committee, Calcutta National Medical College, Kolkata was taken and necessary permission from local Gram Panchayat and Chief Medical Officer of Health, Burdwan (East) was obtained.

Inclusion criteria: People aged more than 60 years of age, those who gave informed consent and were permanently residing in the block since last one year were included.

Exclusion criteria: Those who had major psychiatric disease or terminally ill or absent during data collection were excluded.

Multistage and proportionate population sampling method was used for selecting study subject and initially out of 111 villages in the block. Total 20% i.e., 23 villages were selected randomly and the study subjects were selected from these 23 villages. Line listing of the geriatric population from each village was done with the help of voter's list. From these villages, geriatric study subjects were selected by population proportionate sampling method.

Sample size calculation: The following formula was used:

$N=(z_\alpha+z_\beta)^2 \times p(1-p)/d^2$, assuming 50% morbidity among geriatric population, 10% absolute precision, α-0.05, power of study 80% $(1-\beta=0.84)$, 10% non respondent and design effect. So, the final sample size was calculated as 436.

From the voter list of each selected village, geriatric population were isolated. Simple random method was used for the study to select the subjects and proportionate population sampling was used for number of study subjects from the selected village. Maximum 30 elderly persons were taken from a village, whereas six was the minimum.

Questionnaire

Data was collected by using a structured interviewer-administered questionnaire, from individuals who gave informed consent. After initial preparation, the questionnaire was judged by faculty members in CNMCH, Kolkata who made necessary corrections. Face validity of each item and content validity of each domain were ascertained by them. Pretesting was done among 30 elderly people in another, but similar rural area. During pretesting questions which were found to be irrelevant, ambiguous, not comprehensive were omitted and those questions were added for revealing necessary information according to stated objectives.

For clinical and anthropometrical assessment, stethoscope, aneroid blood pressure machine, weighing machine, flexible measuring tape, digital glucometer (One Touch Select Plus; Manufacturer: Life scan Europe) and previous and existing health records were used.

Working definitions:

- **Age category:** Three age categories were selected i.e. age group from 60-69 years- Young old or 'not so old', age group 70-79 years- Old old, and age group 80 years and above - 'older old' or 'very old' [8].

- **Socio-economic Class:** according to Modified BG Prasad Socio economic scale, 2020 [9]

- **Habit of addiction-** Tobacco chewing, tobacco smoking, consumption of alcohol

- **World Health Organisation (WHO) Classification of Body Mass Index (BMI) [10]** were underweight (<18.5), normal (18.5-24.9), preobese (25-29.9), obese ≥30.

- **Classification of blood pressure (in mmHg) [11]-** <120/<80 -Normal, Systolic blood pressure ≥140 and Diastolic blood pressure ≥90 were considered as hypertensive.

- **Classification of diabetes (in mg/dL) [12]** were Normal (Fasting-70-99, Post Prandial Blood Sugar (PPBS) <140); Diabetic (Fasting >126, PPBS >200).

STATISTICAL ANALYSIS

Data entry and analysis were done in Statistical Package for Social Sciences (SPSS) version 16.0. Frequency distribution tables were used for descriptive statistics. Chi-square test was used when variables were categorised and level of significance was considered as 5%.

RESULTS

Out of total 436 subjects, 98 (22.5%) were either widow/widower or unmarried and most of them belonged to Hindu (85.3%) community. About 44% of them were illiterate and currently not attached to any sort of jobs (64.9%). More than half of the population (51.6%) were in lower socio-economic group and 177 (40.6%) got pension. About 24.3% of them are addicted and 165 (37.8%) of them were underweight [Table/Fig-1].

Socio-demographic variable		Number	Percentage
Gender	Male	263	60.3
	Female	173	39.7
Age group (Years)	60-69 (Young old)	272	62.4
	70-79 (Old)	143	32.8
	≥80 (Very old)	21	4.8
Marital status	Married	338	77.5
	Widow/Widower/Unmarried	98	22.5
Religion	Hinduism	372	85.3
	Islam	64	14.7
Educational status	Illiterate	192	44.1
	Literate	244	55.9
Employment	Unemployed	283	64.9
	Employed	153	35.1
Socio-economic status	Upper middle to lower middle	211	48.4
	Lower	225	51.6
Receiving pension	Yes	177	40.6
	No	259	59.4
Type of family	Joint	241	55.3
	Nuclear	195	44.7
Addiction	Yes	106	24.3
	No	330	75.7
Dependency	Yes	271	62.2
	No	165	37.8
BMI	Underweight (<18.5 kg/m²)	165	37.8
	Normal (18.5 – 24.9 kg/m²)	242	55.5
	Preobese to Obese (≥ 25 kg/m²)	29	6.7

[Table/Fig-1]: Distribution of study population according to socio-demographic variables (N=436).

Pallor was present among 53.2% females and 24.3% males. Regarding health problems GI system involvement (98.2%) was highest followed by musculo-skeletal system (92.4%). Prevalence of both hypertension (71.7%) and diabetes (30.6%) were higher among female population than male [Table/Fig-2]. Significant association (p=0.0001) between age group (60-69 years), female gender, obese

System		Male (n=263)		Female (n=173)	
		Number	%	Number	%
Haematological (n=156)	Pallor	64	24.3	92	53.2
Gastrointestinal (n=428)	Acid Peptic Disorder (APD)	123	46.8	102	58.9
	Bowel Disorder	178	67.7	150	86.7
	Others (Anorectal, Liver diseases)	136	51.7	154	89.0
Nervous (n=152)	Tremor	87	33.1	59	34.1
	Stroke	10	3.8	2	1.2
	Others (Convulsion, Vertigo)	26	9.9	31	17.9
Musculoskeletal (n=403)	Arthritis (Osteo and Rheumatoid)	102	38.8	151	87.3
	Spondylosis (Cervical and Lumber)	81	30.8	63	36.4
	Others (Trauma)	8	3.0	8	4.6
Respiratory (n=168)	COPD	101	38.4	16	9.2
	Bronchial asthma	10	3.8	1	0.5
	Chronic bronchitis	49	18.6	12	6.9
Dermatological (n=93)	Dermatitis	20	7.6	14	8.1
	Fungal	42	16.0	14	8.1
	Others (Allergic, Psoriatic)	19	7.2	16	9.2
Cardiovascular (n=94)	Ischaemic heart disease	34	12.9	16	9.2
	Heart failure	25	9.5	6	3.5
	Hypertension	110	41.8	124	71.7
Genitourinary (n=127)	Urinary incontinence	2	0.7	43	24.9
	Benign hypertrophy of prostate	11	4.2	-	-
	Others (Prolapse, cystitis, hydrocele, CA cervix)	22	8.4	59	34.1
Endocrinal (n=37)	Hypo and Hyperthyroidism	4	1.5	31	17.9
	Diabetes	30	11.4	53	30.6
Ocular (n=336)	Cataract	156	59.3	129	74.6
	Glaucoma	40	15.2	11	6.4
ENT and Dental (n=104)	Hearing Loss	37	14.1	11	6.4
	Dental caries	25	9.5	31	17.9

[Table/Fig-2]: Gender wise distribution of study population in presence of diseases involving different system (N=436).

population, dependency on others and Diabetes were observed in the present study [Table/Fig-3]. Similarly age group (60-69 years), female gender, marital status, addiction, Body Mass Index, Socio-economic Status and dependency on others were significantly associated with hypertension [Table/Fig-4].

Socio-demographic factors		Diabetic (n=83) No. (%)	Non diabetic (n=353) No. (%)	χ^2	df	p-value
Age (Yrs)	60-69 (n=272)	75 (27.6%)	197 (72.4%)	34.19	1	0.0001
	≥70 (n=164)	8 (4.9%)	156 (95.1%)			
Gender	Male (n=263)	30 (11.4%)	233 (88.6%)	25.3	1	0.0001
	Female (n=173)	53 (30.6%)	120 (69.4%)			
Type of family	Joint (n=241)	51 (21.2%)	190 (78.8%)	1.57	1	0.2
	Nuclear (n=195)	32 (16.4%)	163 (83.6%)			
BMI	Underweight (n=165)	19 (11.5%)	146 (88.5%)	9.57	1	0.0001
	Normal to Obese (n=271)	64 (23.6%)	207 (76.4%)			
Dependency	Dependent (n=271)	51 (18.8%)	220 (81.2%)	44.15	1	0.0001
	Independent (n=165)	32 (19.4%)	133 (80.6%)			
SES	Upper Middle (UM) to Lower Middle (LM) (n=211)	33 (15.6%)	178 (64.4%)	3.06	1	0.08
	Lower (n=225)	50 (22.2%)	175 (77.8%)			

[Table/Fig-3]: Association between Diabetes Mellitus and different socio-demographic factors (N=436).
BMI: Body mass index; SES: Socio-economic status; p-value <0.05 considered significant

Socio-demographic factors		Normotensive (n=202) No. (%)	Hypertensive (n=234) No. (%)	χ^2	df	p-value
Age (Y)	60-69 (n=272)	106 (38.9%)	166 (61.1%)	15.75	1	0.0001
	≥70 (n=164)	96 (58.5%)	68 (41.5%)			
Gender	Male (n=263)	153 (58.2%)	110 (41.8%)	37.39	1	0.0001
	Female (n=173)	49 (28.3%)	124 (71.7%)			
Marital status	Currently married (n=338)	139 (41.2%)	199 (58.8%)	16.39	1	0.0001
	Widow/ Widower or Unmarried (n=98)	63 (64.3%)	35 (35.7%)			
Type of family	Joint (n=241)	109 (45.2%)	132 (54.8%)	0.26	1	0.6
	Nuclear (n=195)	93 (47.7%)	102 (52.3%)			
Addiction	Yes (n=106)	68 (64.2%)	38 (35.8%)	19.94	1	0.0001
	No (n=330)	134 (40.6%)	196 (59.4%)			
BMI	Underweight (n=165)	115 (69.7%)	50 (30.3%)	58.29	1	0.0001
	Normal to obese (n=271)	87 (32.1%)	184 (67.9%)			
Dependency	Dependent (n=271)	92 (33.9%)	179 (66.1%)	44.15	1	0.0001
	Independent (n=165)	110 (66.7%)	55 (33.3%)			
SES	UM to LM (n=211)	123 (58.3%)	88 (41.7%)	23.53	1	0.0001
	Lower (n=225)	79 (35.1%)	146 (64.9%)			

[Table/Fig-4]: Association between Hypertension and different socio-demographic factors (N=436).
p-value <0.05 considered significant

DISCUSSION

The study conducted in a community development block of Burdwan District, West Bengal to find out the morbidity profile among geriatric population. Among the 436 study population, the study found that 62.4% were young old, 32.8% old and 4.8% very old in elderly population. This finding corroborated with study by George LS et al., (70% young old, 27% old old and 3% very old old) and Kant S et al., (67.8% young old, 21.9% old old and 10.3% very old) [13,14]. Majority (51.2%) of the study subjects were from lower socio-economic class similar to the study of Burman J et al., in 2019 at West Bengal where 48.7% were from lower economic class [15]. Regarding nutritional status, current study found that 37.8% were underweight and 6.7% were pre-obese to obese similar to study of Ghosh J et al., [16].

In the present study, 24.3% male and 53.2% female had pallor, disease involving GI system (98.2%) was highest followed by

musculo-skeletal (92.4%) system. Morbidity regarding bowel disease (APD and constipation), arthritis, COPD, hypertension, tremor, urinary incontinence, cataract and diabetes appeared to be the major problems similar to the study conducted by Adhikari P and Paul NS and Asirvatham M [17,18]. In the present study, socio-demographic factors like age, gender, type of family, marital status, BMI, socio-economic scale, dependency and addiction are significantly associated with hypertension and same was seen with diabetes except family type and addiction. In a study at Tamil Nadu done by Radhakrishnan S and Balamurugan S; it was seen that age, BMI and smoking were significantly associated with hypertension and diabetes among geriatric population [19]. In another study done by Kapil U et al., in Uttarakhand among geriatric population it was found that advancing age and increasing BMI were significantly associated with hypertension and diabetes, same as the present finding [20]. Co-morbidities among geriatric population found in different studies done in other corners of rural India has been compiled in [Table/Fig-5] and compared with the findings of the present study [21-29].

	Bardhan H et al., [21]	Bharati DR et al., [22]	Jadhav VS et al., [23]	George LS et al., [13]	Singh K and Dey S et al., [24]	Kumar V et al., [25]	Kumar R et al., [26]	Kshatrapal P et al., [27]	Sharma D et al., [28]	Datta PP et al., [29]	Present study
Pallor		86	8.32			20.8	32.8	29.65	16.5		35.78
Diabetes	10	43	30.92	17.4	7		32.3	22.09	5.8	26.1	19.04
Hypertension	22.4	47.7	21.6	20.9	19.6		52.8	47.09	40.5	53.3	53.67
IHD							11.2				11.47
COPD							16.4				26.83
Bronchial asthma				9.6							2.52
Chronic bronchitis				13.5							13.99
Arthritis (Osteo and Rheumatoid)				35.2			22.5				58.03
Urinary incontinence				1.7							10.32
Bowel disorder											75.22

Cataract	55.61		40.16	50.4	19.55	36.8	24.2	62.79	30	65.37
Dental caries	58.7			2.6	2			65.69	13	12.84
Hearing	22.44		24.8	9.6	4		10.3	30.23		11.01

[Table/Fig-5]: Morbidity comparison with other studies (data is in percentage) [21-29].
IHD: Ischemic heart disease; COPD: Chronic obstructive pulmonary disease

Limitation(s)

The main limitation of the study were short time period due to pandemic situation and recall bias.

CONCLUSION(S)

From the present study, it was concluded that geriatric population suffered more from multiple co-morbidities predominantly musculoskeletal disorders, GI disorder, hypertension and ophthalmic disorders. Females were predominately affected more than their counterpart. A significant number of study populations were undernutrition and most of them belonged to lower socio-economic group. Diabetes and hypertension were significantly associated with age group (60-69 years), gender (female), BMI (obese), dependency on others. As the age increases in elderly population physical, social, mental as well economical dependency increases along with multiple morbidities. Henceforth for healthy, active and productive geriatric population a strong ecosystem is required for them and the responsibility lies not only on State/Government level but also community, society, family an individual level. Comprehensive, coordinated an concerted health system approach would be required for better compliance and healthy life for geriatrics.

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