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MORBIDITIES AMONGST INMATES OF HOME-FOR-AGED IN NAGPUR CITY: A CROSS SECTIONAL STUDY

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ABSTRACT

Background: Ageing is universal, inevitable, irreversible slow process that results in detrimental changes in physiological function of most tissues and organ system. The number of aged is increasing rapidly. It carries important social and economic implications. The problems faced by aged persons are multiple, multi dimensional, not merely medical but socio-economical, emotional, psychological, rehabilitative and related to social security. The common morbidities due to ageing are cardiovascular, musculoskeletal, cataract, hearing impairment, etc. This study was undertaken to study some epidemiological factors for morbidities amongst inmates of home for aged.

Objectives: To estimate the prevalence of morbidities among the inmates of home for aged and study some epidemiological factors related with them in two homes for aged in Nagpur city, central India.

Methods: A cross sectional study undertaken in two homes for aged namely Panchvati Vridhashram, Umrer road and Home for aged, Untakhana, Nagpur. Total 176 participants were interviewed and examined who consented for study.

Result: Mean age of study subjects was 73.47±6.06 year ranging from 61 to 90 years. Around one-fifth of study subjects (19.32%) were illiterate. Significantly more illiterate study subjects were of female gender (chi-square = 5.78, d.f. = 1, P = 0.016). Mean duration of stay in home for aged was 5.29±3.29 years with the range of 9 months to 17 years. Every inmate had one or other morbidity. Mean number of morbidities was 3.86±1.38 per person. There is positive correlation between age and average number of morbidities per person with strong linear trend (r = 0.5973, P = 0.0001). Prevalence of asthma was significantly higher among males as compared to females (Chi square = 4.15, d.f. = 1, P = 0.041). Prevalence of deafness was significantly higher among males as compared to females (Chi square = 5.18, d.f. = 1, P = 0.02). Prevalence of edentulous females was significantly higher than edentulous males (Chi square = 4.99, d.f. = 1, P = 0.025). Seven (41.18%) cases of diabetes mellitus (n = 17) and 9(8.74%) cases of hypertension (n=103) were newly diagnosed during the study.

Conclusion: Every inmate of home for aged had one or other morbidity. Average number of morbidities increases with age. Average number of morbidities among illiterate is more than literate subjects. Prevalence of asthma and deafness was significantly higher among male. Prevalence of edentulous was significantly more among females.

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INTRODUCTION

Ageing is universal, inevitable, irreversible slow process that results in detrimental changes in physiological function of most tissues and organ system. No one knows when old age begins.

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The biological age of a person is not identical with his chronological age. Since there is no yardstick regarding measurement of old age, WHO defines old age as "the period of life when impairment of physical and mental functions becomes increasingly manifested by comparison in the previous period of life" (Davies, 1985). In India the proportion of people above 60 years of age grew from 5.4% in 1951 to 6.58% in 1991. The proportion of elderly 8.6% of total population in year 2011 (Dawale, 1997). The increase in life

expectancy has been most dramatic in developing countries during past 50 years. In India, life expectancy which was 32 years for men and 31 years for women in 1941 has increased to 60 years by 1993. Life expectancy at birth in year 2015 was 68.3 years (66.9 for male and 69.9 for females). And will reach a level of 73 years by 2025 (World Health Organization, 1974). The life expectancy in India at birth is 65.4 years according to UNDP economic fact sheet 2011 (United Nations Development Programme, 2011). Data available from India suggest that almost 50 per cent of the elderly suffer from chronic diseases with the prevalence of diseases increasing with rising age from 39 per cent in 60-64 years to 55 per cent in that older than 70 years (National Sample Survey Organisation, 1991). The number of aged is increasing rapidly. It carries important social and economic implications. The problems faced by aged persons are multiple, multi dimensional, not merely medical problems but other problems like socio-economical, emotional, psychological, rehabilitative and related to social security. The common morbidities due to ageing are cardiovascular, musculoskeletal, cataract, hearing impairment, etc (World Health Organization, 1974). Old Age Home is the institution where the older person is admitted in, to meet needs there. They spend their old age in the company of the people, who are similar to them in age, state of health, mental make-up and outlook towards life (Mahapatra, 2010). Considering all the above mentioned facts, social factors and age related health morbidities reported in inmates of home for aged, this study was undertaken to estimate prevalence of morbidities and study some epidemiological factors related with it.

MATERIAL AND METHODS

Study design and setting

The present cross sectional study was carried out at two different homes for aged in Nagpur city to study the prevalence of morbidities among the inmates of home for aged. 'Panchvati Vridhashram', Umrer road and 'Home for aged', Untakhana, Nagpur were selected purposively. Study was carried out from July 2011 up to June 2012.

Sample size

Sample size estimated using formula, $n = 3.84pq/d^2$, with assumption prevalence of morbidities among elderly as 50% (National sample survey organization, 1991), (p), (q=1-p), acceptable margin of error (d) 15% and level of significance 5% comes out to be 171. However all the inmates in both the homes for aged above 60 years were included in study and the study sample were 176. There were 178 inmates in both the homes for aged of which 176(98.87%) consented to participate in the study.

Methodology

Ethical clearance from institutional ethics committee was obtained prior to study. The object of the study and method was explained to authorities of home for aged. Written permission to conduct the study was sought from authorities of both the homes for aged. Informed consent of the study subjects was also obtained prior to interview and physical examination. A predesigned pretested proforma was used to record the information and findings in each inmate. The study

subjects were examined in a separate room at home for aged. Rapport was established with the study subjects prior to the examination. Demographic information and socioeconomic details of the study subjects were obtained. Modified Kuppuswamy scale (Mishra, 2003), was used to assess socioeconomic status. General and systemic examination was carried out and findings were recorded. Body weight was measured once to the nearest 0.5Kg with the study subject standing motionless, without shoes, in minimal clothing on the Bathroom Scale weighing machine. Weighing machine was standardized weekly with the help of standard weights of 10 and 20kg. Height in standing position was measured once, to the nearest 0.5 cm, by SICCA Anthropometric Rod (Integrated Disease Surveillance Project, 2005), with the subject standing in upright position without shoes, eyes looking straight ahead, with a set square resting on the scalp.

Blood pressure was measured by Mercury Sphygmomanometer. The study subject was made comfortable and seated at least for 5 minutes in the chair before measurement. Two measurements were recorded 5 minutes apart in right arm in sitting position with cuff size of 14 cm width. Average of the two measurements was taken (Chobanian, 2003). Visual acuity was tested for distant vision by using Snellen's chart. Examination of both eyes was done using torch. Auditory examination for hearing impairment was done by using tuning fork of frequency 256 kHz, 512 kHz, 1024 kHz (Dhingra, 2002). Rinne test and Weber Test was performed. Twelve lead ECG of all the study subjects was recorded using ECG machine Vesta101 of RMS Company, Chandigarh (Goldberger, 2005). Fasting blood glucose was measured using Accucheck Glucometer. Capillary blood was collected for estimation of fasting blood glucose. If the fasting blood glucose level was more than 110mg/dl the study subject was given 75 gm of glucose and post glucose level was noted after 2 hours of glucose consumption. Those who were known diabetic were not given 75 gm of glucose. If the post glucose level was more than 200mg/dl the subject was considered to have Diabetes mellitus (World Health Organization, 2002). Haemoglobin was measured by cyanmethemoglobin method (Rusia, 2002). Capillary blood was collected to estimate haemoglobin. Anaemia in study subjects was classified according to WHO classification for anaemia (World Health Organization, 1968).

Statistical Analysis

Descriptive statistics like mean, standard deviation, range were used to summarize quantitative variables while percentages and proportions were used to summarize categorical variables. Associations between two categorical variables were analysed by using Chi-Square test and Fischer exact test. Linear trends in morbidities were assessed by Chi-square test for trend and Pearson's correlation coefficient. P value < 0.05 was considered to be statistically significant. Data was analyzed using STATA (10.1 version, 2009) statistical software.

RESULTS

The present cross sectional study was carried out at two different homes for aged in Nagpur city, central India to study the prevalence of morbidities among the inmates of home for aged. Total 176 study subjects were interviewed and examined. In Panchvati Vridhashram, Umrer road, there were 76 inmates and in Home for Aged, Untakhana, there were 100

study subjects. There were 79 male and 97 female study subjects. Characteristics of study subjects were described in Table 1. Mean age of study subject was 73.47 ± 6.06 year and ranging from 61 to 90 years. Majority of study subjects were Hindu 135 (76.70%), followed by Christian 25 (14.20%), Buddhist 13 (7.39%) and Muslim 3(1.71%). The higher percentage of Hindus could be due to higher percentage of Hindus in general population. As Home for Aged, Untakhana, runs by Christian organisation relatively higher percentage of Christian inmates. Illiterate study subjects were 34 (19.32%). Significantly more illiterate study subjects were of female gender (chi- square = 5.78, d.f. = 1, P = 0.016). Majority of study subjects were from nuclear family before joining the home for aged 110 (62.50%), followed by three generation family 49 (27.84%) and Joint family 17 (9.66%).

per person and strong linear trend observed ($r = 0.5973$, $P = 0.0001$). Table 3 shows distribution of study subjects according to morbidities by gender. In present study all the inmates of both genders were found to be morbid during the study period. Prevalence of asthma is significantly higher among males as compared to females (Chi square = 4.15, d.f. = 1, $P = 0.041$). Prevalence of deafness was significantly higher among males as compared to females (Chi square = 5.18, d.f. = 1, $P = 0.02$). Prevalence of edentulous females is significantly higher than edentulous males (Chi square = 4.99, d.f. = 1, $P = 0.025$). Other morbid condition does not show any significant relation with gender. Out of 69 anaemic subjects 39 and 30 had mild and moderate anaemia respectively. No subject has severe anaemia. In this study 17(9.66%) were having Diabetes mellitus out of 176 inmates.

Table 1. Characteristics of study subjects

Characteristics	Male (n=79)		Female (n=97)		Total (n= 176)	
	No	%	No	%	No	%
Age in years						
60-64	01	01.27	04	04.12	05	02.84
65-69	15	18.98	24	24.75	39	22.16
70-74	29	36.71	32	32.99	61	34.66
75-79	14	17.72	22	22.68	36	20.45
≥ 80	20	25.32	15	15.46	35	19.89
Literacy status						
Illiterate	09	11.39	25	25.77	34	19.32
Literate	70	88.61	72	74.23	142	80.68
Marital status						
Married	02	02.53	02	02.06	04	02.27
Unmarried	18	22.79	14	14.43	32	18.19
Divorced	02	02.53	01	01.03	03	01.70
Widower/Widow	54	68.35	79	81.45	133	75.57
Separated	03	03.80	01	01.03	04	02.27
Economic dependency						
Independent	19	24.05	17	17.53	36	20.45
Dependent	60	75.95	80	82.47	140	79.55
Previous occupation						
Unskilled worker	14	17.72	00	00.00	14	07.95
Semiskilled worker	25	31.65	05	05.15	30	17.04
Skilled worker	32	40.50	03	03.09	35	19.89
Professional	08	10.13	05	05.15	13	07.39
Homemaker	00	00.00	84	86.61	84	47.73
Frequency of visit by relatives and/or friends						
Monthly	01	01.27	01	01.03	02	01.14
Occasionally	71	89.87	95	97.94	166	94.32
Never	07	08.86	01	01.03	08	04.54
Leisure time activity						
Watching TV	65	82.28	58	59.79	123	69.89
Temple visit	06	07.59	46	47.42	52	29.55
Routine work	23	29.11	22	22.68	45	25.57
Reading	14	17.72	24	24.74	38	21.59
Listening Radio	08	10.13	03	03.09	11	06.25
Meditation	03	03.80	02	02.06	05	02.84
Other	02	02.53	08	08.25	10	05.68

Majority of inmates 136(77.27%) were economically dependent of which 78(57.35%) were females and 58(42.65%) were males. But the difference was not statistically significant (Chi- square = 1.21, d.f = 1, $P = 0.27$). Mean duration of stay in home for aged was 5.29 ± 3.29 years with the range of 9 months to 17 years. Maximum number of inmates 82(46.59%) were belonging to upper lower class as per Modified Kuppaswami's socio- economic scale, followed by 77(43.75%) to lower middle class, 13(7.39%) in upper middle class and 4(2.27%) in lower class. There was no subject belonging to upper class. Table 2 shows distribution of number of morbidities according to age group. Mean number of morbidities was 3.86 ± 1.38 per person. The average number of morbidities increases as age increases. There is positive correlation between age and average number of morbidities

Out of these, 10(58.82%) were known and 7(41.18%) were newly detected cases of diabetes mellitus. Hypertension was observed in 103(58.52%) out of 176 inmates. Out of these, 94(91.26%) were known and 9(8.74%) were newly diagnosed cases of hypertension.

DISCUSSION

The present cross sectional study was carried out at two different homes for aged in Nagpur city to study the prevalence of morbidities among the inmates of home for aged and some epidemiological factors related with them. There were total 176 inmates in the two homes for aged, of which 79 (44.89%) were males and 97(55.11%) were females. Illiteracy was 19.32% among study subject, this was less as compared to

Venkoba Rao (Venkoba Rao, 1982), proportion of illiterates was 59.5% and Shashikant (Shashikant, Mishra, 2004), found that majority 65% were illiterate. Proportion of widow or widower was 75.57% while Venkoba Rao (Venkoba Rao, 1982) reported the proportion of widow or widower as 48.5% and Shabeen Ara (Shabeen, 1997), reported majority of the

joining the home for aged. Similar observation noted by Dawale, (1997), Majority of study subjects 79.55% was economically dependent. Shashikant (2014), also observed 62% economical dependency. Dawale (1997) reported 81% economical dependency.

Table 2. Distribution of number of morbidities according to age group in study subjects

Age in years	No.	Number of morbidities	Average no. of morbidities per person
60-64	05	013	2.60
65-69	39	104	2.67
70-74	61	235	3.85
75-79	36	152	4.22
≥80	35	176	5.03
Total	176	680	3.86

Fairly strong, positive linear trend, $r=0.5973$, $P=0.0001$

Table 3. Distribution of study subjects according to morbidities by gender

Morbid condition	Gender				Total (n=176)	
	Male (n=79)		Female (n=97)		No.	%
	No.	%	No.	%		
Cardio vascular System						
Hypertension	44	55.70	59	60.82	103	58.52
Ischemic heart disease	01	01.27	04	04.12	05	02.84
Musculoskeletal system						
Arthritis	36	45.57	43	44.33	79	44.89
Cervical spondylosis	06	07.59	05	05.15	11	06.25
Lumber spondylosis	05	06.32	03	03.09	08	04.55
Kyphosis	01	01.27	05	05.15	06	03.40
Scoliosis	01	01.27	01	01.03	02	01.14
Sciatica	00	00.00	01	01.03	01	00.57
Respiratory system						
Acute URI	11	13.92	10	10.31	21	11.93
Asthma	07	08.86	02	02.06	09	05.11
Bronchitis	03	03.80	01	01.03	04	02.27
Central nervous system						
Hemiplegia	02	02.53	04	04.12	06	03.41
Monoplegia	01	01.27	01	01.03	02	01.14
Ataxia	01	01.27	01	01.03	02	01.14
Tension headache	01	01.27	00	00.00	01	00.57
Eye						
Pseudophakia	59	74.68	76	78.35	135	76.70
Cataract	34	43.04	43	44.33	77	43.75
Aphakia	04	05.06	00	00.00	04	02.27
Glaucoma	02	02.53	02	02.06	04	02.27
Conjunctivitis	03	03.80	02	02.06	05	02.84
Pterygium	02	02.53	00	00.00	02	01.14
Single eye blindness	04	05.06	00	00.00	04	02.27
Ear Nose Throat (ENT)						
Deafness	17	21.52	09	09.28	26	14.77
Otitis externa	00	00.00	02	02.06	02	01.14
Chronic suppurative otitis media	01	01.27	01	01.03	02	01.14
Genitourinary system						
Urinary tract infection	01	01.27	02	02.06	03	01.70
Hydrocoele	02	02.53	--	--	02	01.14
Urge incontinence	01	01.27	00	00.00	01	00.57
Gastrointestinal system						
Edentulous	05	06.33	17	17.52	22	12.50
Dyspepsia	07	08.86	04	04.12	11	06.25
Dental caries	05	06.33	02	02.06	07	03.98
Diarrhoea	00	00.00	03	03.09	03	01.70
Oesophageal reflex disease	01	01.26	02	02.06	03	01.70
Haemorrhoids	02	02.53	00	00.00	02	01.14
Other morbidities						
Anaemia	27	34.18	42	43.30	69	39.20
Diabetes mellitus	04	05.06	13	13.40	17	09.66
Impaired GT	02	02.53	01	01.03	03	01.70
Depression	01	01.27	02	02.06	03	01.70
Vertigo	02	02.53	00	00.00	02	01.14
Boil	02	02.53	00	00.00	02	01.14
Miscellaneous	02	02.53	07	07.21	09	05.11

elderly 66% were widowed. Dawale *et al.* (1997) found in their study 147 (66.52%) were widow or widowers. Majority of study subjects 62.50% were from nuclear family before

Before joining the home for aged, 84(47.73%) inmates were homemakers and all were females. The proportion of homemakers was more than Dawale, (1997), who reported 58

(26.25%) was housewife but Shashikant (Shashikant, 2014), in their study reported proportion of homemakers as 182(78%) which was much more. Maximum number of inmates 82(46.59%) were belonging to upper lower class of modified Kuppuswamy's socio economic scale and there was no inmate belonging to upper class where as R Shankar, (Shankar, 2007), found 35(14.5%) subjects belonging to upper class. All the study subjects were having one or other morbidity. Total number of morbidities among 176 inmates was 680; the average number of morbidities per person was 3.86±1.38. Dawale AK, (Dawale, 1997), found similar finding in their study, average number of morbidities per inmate was 3.41. H M Swami (Swami, 2002), in their study reported average number of morbidities per person to be 3.28. R Shankar, (Shankar, 2007) found that 1.93 morbidities per person and Purty, (Purty, 2006), reported average number of morbidities per person was 2.77 which is less than present study. In present study average number of morbidities per person increases as age increases. Significant linear trend was observed between average number of morbidities per person and age. Fairly strong, positive linear trend was observed ($r=0.5973$, $P=0.0001$). The most common morbidity found was pseudophakia in 135(76.70%) study subjects followed by hypertension in 103(58.52%), arthritis in 79(44.89%), cataract in 77(43.75%), anaemia in 69 (39.20%). These findings were similar to the results of the most of the other studies Dawale (1997), observed anemia in 145(65.61%), arthritis in 87 (39.37%), hypertension in 83 (37.56%) and cataract in 69 (31.22%) subjects. HM Swami (2002) morbidities found were hypertension 58%, gastritis 17.67%, deafness 13.53%, and diabetes mellitus 12.15 %. Purty, (Purty, 2006), observed pain in the joints and joint stiffness was the most common morbidity in 139 (43.4%), followed by dental and chewing complaints in 135 (42%), decreased visual acuity due to cataract and refractive errors in 182 (57%) and hearing impairment in 46 (15.4%).

Present study revealed prevalence of Diabetes mellitus was 17(9.65%). Similar finding was noted by (Purty, 2006) in their study prevalence of Diabetes mellitus was 8.1%. Dawale (1997), reported prevalence of Diabetes mellitus as 12.67%. The prevalence of hypertension in present study was 58.52% which was higher as compared to Dawale, (1997), who reported prevalence of hypertension as 37.56%. In our study overall prevalence of asthma was 5.11%. The prevalence of asthma in males was 8.86% and 2.0% in females. The prevalence of asthma was significantly higher among males as compared to females (chi-square = 5.18, d.f. = 1, $P=0.02$). Leena, (Lena, 2009), reported prevalence of asthma in males as 14.1% and in females as 8.2% but Dawale, (1997), reported prevalence of asthma in males as 14.89% and in females as 13.39%. The overall prevalence of deafness was 26 (14.77%). Prevalence of deafness was significantly higher among males (17, 21.51%) as compared to females (9, 9.27%) (Chi square = 5.18, d.f. = 1, $P = 0.02$). Dawale, (1997) reported prevalence of hearing impairment 17.9% but they reported prevalence of deafness in males as 15.96% and in females 18.11%. Venkatrao, (2005) observed prevalence of auditory disability 10%. BB Abutan (1993), reported that the prevalence of deafness was higher in males 55.1% than in females 44.9%. R Shankar (Shankar, 2007), found prevalence of deafness as 3.75%. Overall prevalence of edentulous inmates was 22(12.5%). The prevalence of edentulous females (17,17.53%) was significantly higher than edentulous males (5,6.33%) (chi square = 4.99, d.f. = 1, $P = 0.025$). Rahman, (Rahma, 2009),

observed that 68.0% of males and 62.2 % females have lost their teeth. The overall prevalence of dental morbidities in his study was higher than then present study. Average number of morbidities per person among illiterate was 4.61 which was more than that of 3.69 morbidities per person in literate. The difference was statistically significant ($t = 3.92$, d.f. = 174, P value =0.0001). Similar findings were observed by Joshi Kamlesh, (Joshi, 2003).

Conclusion

In this cross sectional study of home for aged in Nagpur city, all the study subjects were found to have one or other morbid condition. Average number of morbidities per person was 3.86 and majority had multiple morbidities. As the age increases average number of morbidities per inmate increases. The average number of morbidities among illiterate inmates was more than literate members. Pseudophakia and cataract were the most common ocular morbidity among study subjects followed by hypertension and arthritis. Prevalence of asthma and deafness was significantly higher among males as compared to females. But prevalence of edentulous females was significantly higher than edentulous males. Reasonably good number of new cases was detected during study particularly of asymptomatic diabetes mellitus and hypertension. Considering this fact, regular health check up of inmates of home for aged is required for early detection of morbidities and prompt treatment. There is need for economical assistance through social security to economically dependent inmates. There is need for recreational activities for inmates of home for aged in their leisure time.

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