Heart Diseases and its associated factors in Geriatric Population residing in a Metropolitian City

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***Abstract:** Geriatric population is increasing as life expectancy is increasing. This population is susceptible for many health problems which have a significant impact on their quality of life. So this cross-sectional study was carried out from September 2009 to August 2010 on 1620 elderly residing in Municipal corporation area of Jaipur city with the aim to study the heart diseases and its associated factors in geriatric population. Mean age of elderly was 66.08 years with slight female predominance i.e. 1048 females for 1000 males in Jaipur city. Only 285 (17.59%) elderly who were not having and type of morbidity otherwise a sizable count i.e. 573 (35.36%) were having even 4 or more type of co morbidity. Out of total 1620 elderly 544 (33.58%) were having Hypertension and 88 (5.43%) of elderly were having other heart diseases. It was found that all other heart diseases were having hypertension. Obesity was maximal co-morbidly with heart disease followed by Diabetes. Heart diseases were found significantly more in males. Likewise it was also observed that elderly who were doing exercise were having significantly less heart diseases. Hypertension was observed significantly more in elderly who were smoking followed by elderly who were taking alcohol and chewing tobacco. But proportion of heart diseases (other than hypertension) found significantly more in elderly who were taking alcohol than who were smoking.*

Key words- Heart Diseases, Hypertension, Elderly, Geriatric, Metropolitan City.

I. INTRODUCTION

Cardiovascular diseases (CVDs) are the diseases that involve heart and blood vessels. Cardiovascular diseases includes coronary artery diseases (CADs) like angina and myocardial infarction (commonly called as heart attack).[1] Other CVDs are Hypertension, stroke, cardiomyopathies, endocarditis, anurism, atrial fibrillation, venous thrombosis, peripheral artery diseases etc.[1,2] Cardiovascular diseases are major killer disease Globally. Most CVDs occurs in geriatric population, data shows that 11% CVDs occurs in 20-40 years , 37% in 40-60 years and 71% occurs in >60 years of age.[3] And best part of it is that 90% of these are preventable.[4]

There is worldwide trend of increasing geriatric population (> 60 years) which is elicit with the fact that 8.6% of 1980 has increased to 10.8% of total world population in 2010.[4] This "demographic time bomb" is nearing explosion in developed nations. Asia, including India, is not far behind.[5]

Population projection indicates that India will have 198 million 60 plus person in 2030 and 326 million in 2050 when it would be 21% of total population of the country making it the country with the largest elderly population in the world (SRS 2003).[6] The percentage of persons above 60 years of age in India was 7.3% having 6.9% in urban and 7.5% in rural areas. In Rajasthan, this population constitute 6.5% (N.H.P.2008). [7]

Many health problems are known to increase with age and this demographic trend is believed is lead to an increase in the absolute number of health condition in the population as reflected by the growing body of evidence that older people are at risk for multiple, co-morbid conditions.

Various studies have shown that perceived health declines with age and the effect of ill health impacts on many areas of daily activities.

As people become older the functioning and adaptability of the tissues and different organs decline. Geriatric populations suffer both from communicable and non-communicable diseases but due to changing patterns of socioeconomic factors and urbanization, non-communicable diseases are on increase. Elderly people suffer from the dual impact of different chronic diseases and disability resulting from these diseases.

Many health problems are known to increase with age and this demographic trend is believed is lead to an increase in the absolute number of health condition in the population as reflected by that older people are at risk for multiple, co-morbid conditions.[7] Survey conducted by NSSO 1984-85 to 1995-96 detected that 50% of elderly Indians had one or more morbidity while up to 40% of them had one or more functional disability.[8]

Higher morbidity among elderly calls for strengthening of geriatric health care services. Old age persons need special health care different from general population. It is necessary to know the health status and prevailed morbidity pattern in this group. By knowing the prevalent preference of type of medicine system with also help in better framing comprehensive policies to make ageing a comfortable experience. So this study was conducted to assess the health status and morbidity pattern in geriatric population of a metropolitan city.

II.   METHODOLOGY

A cross-sectional study was After taking approval from Institutional Ethics committee, this community based cross sectional survey was conducted on elderly aged 60 years and above living in Municipal Corporation area of Jaipur city, Rajasthan , from September 2009 to August 2010.

Sample size was calculated 643 subjects at 95% confidence limit and absolute sampling error of 2% assuming 6.9% proportion of elderly (as per SRS 2008). As sampling technique used as 30 cluster so calculated sample size was multiplied by 2.[9] So sample size came out to 1286, which was again inflated 20% for contingency addition and came out to 1544. So, for the study purpose 1620 elderly was taken to have 54 elderly from each of 30 cluster.

To start with survey, list of all wards with their respective population was obtained from Municipal Corporation. Then 30 clusters had selected from all the wards of Municipal Corporation as per 30 cluster technique. After selecting the 30 clusters, in the second step colonies were selected within the cluster by lottery method. In case of selected colony not meeting sufficient subject criteria, adjoining colony had taken. To identify elderly included in study, a land mark was identified in the centre of ward/colony previously selected eg, temple, school, and then survey was started from there to have 54 elderly from that selected colony. Likewise the procedure is followed for other clusters. After obtaining written informed consent and ensuring confidentiality and identity of gathered information house to house survey was conducted in identified 30 wards of Jaipur city. House to house survey was done in each identified ward to have 54 elderlies. Thorough personal interview was conducted of each of

selected elderly to fill the semi-structured pre-designed and pre-tested performa. B.G.Prassad's classification of socio economic status (updated till April 2010) was used to find out SES of elderly. Likewise the procedure is followed for other clusters.

The list of wards and colonies were selected are as follows:-

S. No.	Ward no.	Colonies	Serial no.	Ward no.	Colonies
1	1	Dadi ka Phatak	16	30	Jawahar nagar
2	3	Ashok Nagar and modi nagar	17	34	Fateh Tiba
3	4	SushilPura	18	37-	Chand pole gate
4	6	C-Scheme	19	41	Chokdi Topkhana Hujuri
5	9	Sri Ram nagar Vistar	20	45-	Moti Singh bhomia ka rasta
6	11	Dharm Park	21	47	Guljar Masjid
7	12	Rajiv Nagar(hasanpura)	22	50	Hida Ki Mori
8	13	Man Sarovar sector 10	23	52	Anand Puri
9	15	Jetpuri(Mahesh nagar)	24	54	Pratap nagar sector 8
10	17	Sitaram colony	25	57	Foota Khurra
11	21	Durgapura	26	60	Uniaro Ka Rasta
12	23	Jagannath Puri	27	62	Nahri ka Naka
13	24	Jagdish Colony	28	65	Sanjay nagar bhatta basti
14	27	Jhalana Basti	29	68	Saket Colony and tirth nagar
15	28	Prem Nagar	30	70	Shyam nagar

Data thus collected were compiled in the form of master chart in MS Excel 2007 worksheet. Parametric and Non Parametric statistical techniques were used with the help of statistical software Primer (version 6). Chi-Square Test was used to find associations. 'p' value <0.05 was taken significant for inferences.

III. RESULTS

Mean age of studied elderly was observed 66.08 years with age range 60 years to 91 years with slight female predominance i.e. 51.18% and 48.82% of male and female respectively (M:F=0.95). (Figure 1)

Figure 1
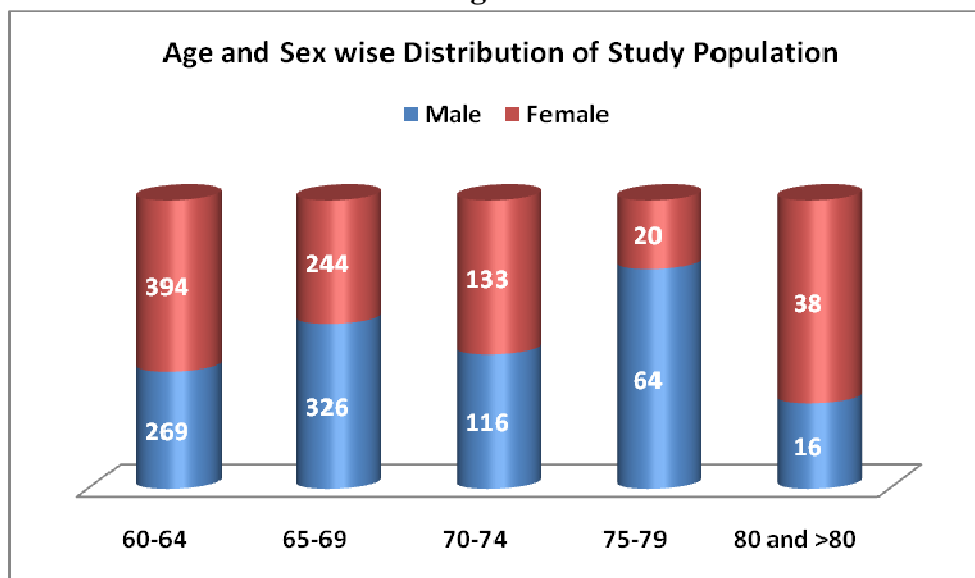
It was also observed that mean weight is lower for females compared to males at all age groups. Mean weight also decrease with advancing age in both sexes. (Table 1)

Table 1

Age and Sex wise Mean Weight distribution in Study Population

S. No.	Age Groups (in Years)	Male			Female		
		Mean	**SD**	**SEM**	**Mean**	**SD**	**SEM**
1	60-64	65.77	8.38	0.51	65.65	9.10	0.45
2	65-69	69.18	11.29	0.62	67.52	9.06	0.58
3	70-74	69.15	9.41	0.87	66.89	8.89	0.77
4	75-79	66.84	8.02	1.00	66.82	9.36	2.98
5	80 and above	66.70	8.71	2.17	66.65	9.83	1.59

Out of 1620 elderly studied, only 285 (17.59%) of elderly were not having any type of illness at the time of survey remaining were having one or more type of illness. (Figure 2)

Hypertension was found in 544 (33.58%) and other heart diseases were found in 88(5.43%) of elderly. (Figure 3)

Figure 2

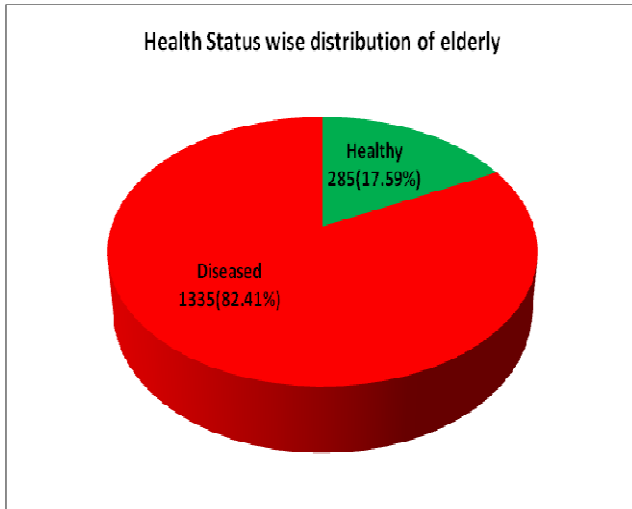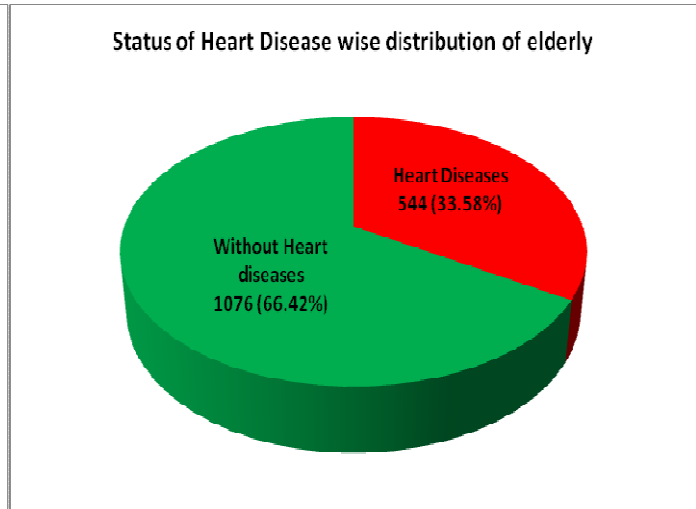**Health Status wise distribution of Elderly**

Figure 3

Status of Heart Diseases wise distribution of Elderly

Health Status wise distribution of elderly

Healthy
285(17.59%)

Diseased
1335(82.41%)

Status of Heart Disease wise distribution of elderly

Heart Diseases
544 (33.58%)

Without Heart
diseases
1076 (66.42%)

When association of other heart diseases with hypertension was revealed it was found that all other heart diseases were having hypertension. (Figure 4)

When association of heart diseases with other diseases was revealed it was found that majority of heart diseases were in co-morbidity with other diseases. Obesity was maximal co-morbidly followed by Diabetes. (Figure 4)
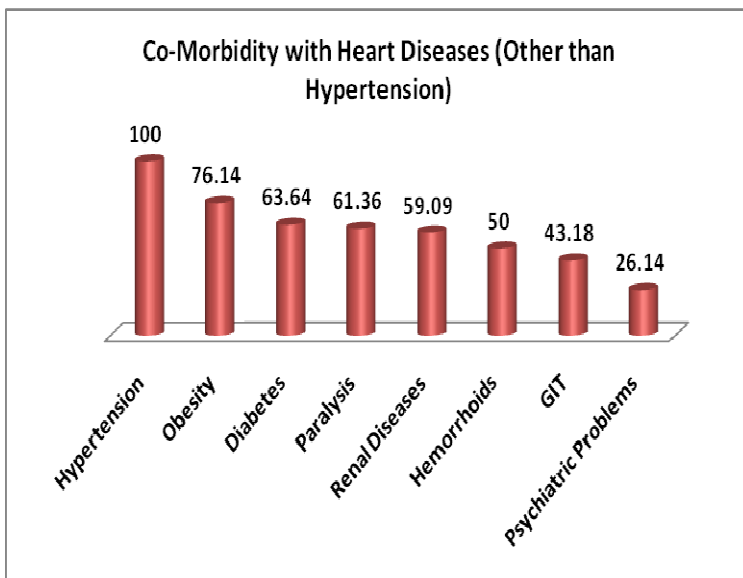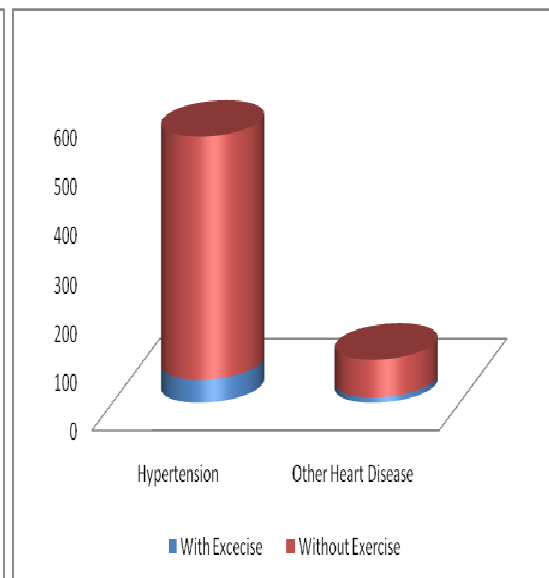
Figure 4

Co-morbidity with Heart diseases in Elderly

Figure 5

Association of Exercise with Heart Diseases

Co-Morbidity with Heart Diseases (Other than Hypertension)

100   76.14   63.64   61.36   59.09   50   43.18   26.14

Hypertension   Obesity   Diabetes   Paralysis   Renal Diseases   Hemorrhoids   GIT   Psychiatric Problems

600
500
400
300
200
100
0

Hypertension   Other Heart Disease

■ With Excecise   ■ Without Exercise

Proportional case rate of heart diseases (excluding Hypertension) was maximum (77.14%) among paralysis cases followed by Renal diseases, Hemorrhoids, obesity, diabetes, hypertension etc. (Table 2)

Table No.2

Major Co-Morbidity with Heart diseases excluding Hypertension in Study Population (N=1620)

S. No.	Type of Morbidity	Total Cases	Co-Morbidity with Ht Diseases	PCR*
1	Paralysis	70	54	77.14
2	Renal Diseases	120	52	43.33
3	Hemorrhoids	104	44	42.31
4	Obesity	199	67	33.67
5	Diabetes	254	56	22.05
6	Hypertension	544	88	16.18
7	Git	243	38	15.64
8	Tb	42	2	4.76
9	Psychiatric Problems	880	23	2.61
10	Dental Problems	487	6	1.23
11	Musculo- Skeletal Problem	776	4	0.52

*PCR=Proportional Case rate
Note : Multiple response

When association of sex with heart diseases was revealed it was also observed that male shows high preponderance of hypertension and heart diseases however which was not found significant (p>0.05) with Hypertension but found significant (p<0.05) for other heart diseases excluding Hypertension. (Table 3)

Table 3

Association of Heart Diseases with Sex in Elderly

S. No.	Morbidity	Male (N=791)	Female (N=829)	Total (N=1620)	Chi-square Test at 1 DF P Value LS
1	Hypertension	279 (35.27%)	265 (31.97%)	544 (33.58%)	1.838 0.175 NS
2	Heart Diseases	60 (7.59%)	28 (3.38%)	88 (5.43%)	29.427 <0.001 NS

When association of exercise with heart diseases was revealed it was also observed that elderly who were doing exercise were having significantly less (p<0.001) heart diseases. (Figure 5)

Figure 5

Association of Exercise with Heart Diseases
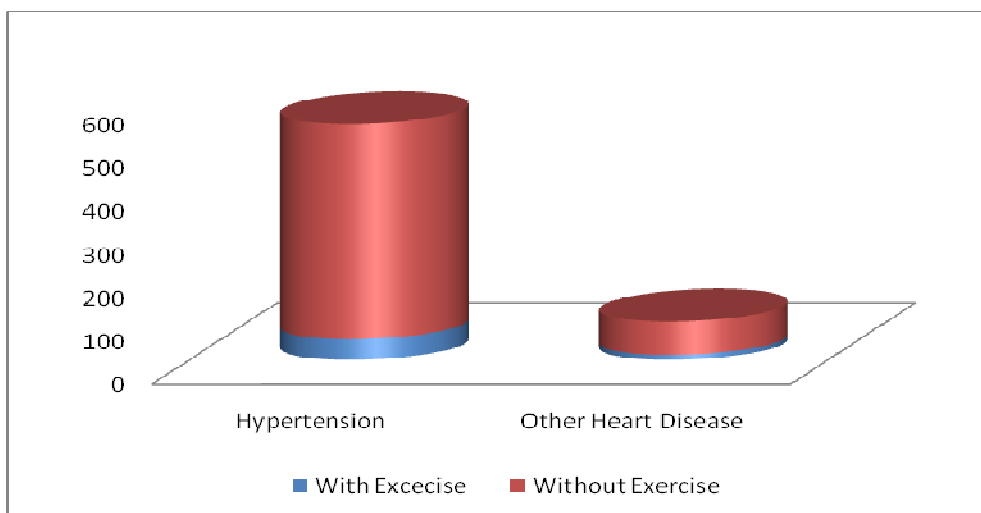
Chi-squre test for Hypertension= 520.641 at 1 DF   P Value<0.001   LS=S

Chi-squre test for Heart Diseases(excluding Hypertension)= 46.979 at 1 DF, P Value<0.001 LS=S

When association of type of exercise with heart diseases was revealed it was found that although proportion of heart diseases were less in elderly doing Yoga than the other group but it was found significant for heart diseases other than hypertension. (Table 4)

Table 4

Association of Heart Diseases with Sex in Elderly

S. No.	Morbidity	Type of Exercise			Chi-square Test at 1 DF	
		Yoga (N=166)	Walking (N=591)	Others (N=30)	P Value	LS
1	Hypertension	4	42	1	5.478 0.065	NS
2	Heart Diseases	0	9	2	8.463 =0.015	S

When association of personal habit of chewing tobacco, smoking and alcohol with heart diseases was revealed it was found that hypertension was observed more in elderly who were smoking followed by elderly who were taking alcohol and chewing tobacco. And this difference in proportion was found significant (p<0.001). Likewise, it was also found that proportion of heart diseases found significantly more (p<0.001) in elderly who were taking alcohol than who were smoking. (Table 5)

Table 5

Association of Personal Habits with Sex in Elderly

S. No.	Morbidity	Type of Personal Habits			Chi-square Test at 1 DF	
		Tobacco (N=234)	Smoking (N=353)	Alcohol (N=81)	P Value	LS
1	Hypertension	84	189	67	54.755 <0.001	S
2	Heart Diseases	0	68	8	50.234 <0.001	S

IV. DISCUSSION

In this study, It was found that the percentage of elderly females was slightly more (51.18%) than males (48.82%) giving a sex ratio of 1048 females per thousand males. These observations were well in resonance with other authors. Observations made by Seby et al (2011)[10] Nandi P S et al (1997)[11] and Purna Singh et al (2012)[12] were also almost similar to present study. Even SRS (2003) India survey reported 1136 women for every 1000 men in the age group > 60 years.[6]

Commonest reported morbidity in present study was Psychiatric morbidity (54.32%) followed by Musculo-Skeletal problems (47.90%) Cataract (46.97%), Hypertension (33.58%), Dental problems (30.06%). The present study supported conclusion of the earlier studies that Visual Impairments, Hypertension, Arthritis and Dental Problems are extremely common complaints in the Elderly.[13-15] Rahul Prakash et al[16] shows that 70% elderly were suffering from ophthalmic problems, 48% with hypertension and 42% with psycho-social problems.

Overall prevalence of diabetes in the study population was 15.67%. Dey et al (2001)[13] found a prevalence of 15.20% among the elderly subjects attending geriatric clinics. Canadian study of Health and Aging (CSHA-1) estimated the prevalence of diabetes mellitus among the elderly to be 12.1%. Several other studies have reported it to vary from 6-16%.[17]

Hypertension was found in 544 (33.58%) and other heart diseases were found in 88(5.43%) of elderly. When association of other heart diseases with hypertension was revealed it was found that all other heart diseases were having hypertension. When association of heart diseases with other diseases was revealed it was found that majority of heart diseases were in co-morbidity with other diseases. Obesity was maximal co-morbidly followed by Diabetes. Survey conducted by NSSO [8]1984-85 to 1995-96 detected that 50% of older Indians had one or more morbidity while up to 40% of them had one or more functional disability. Other authors also reported almost similar observations regarding co-morbidity with heart diseases.

In this study male shows high preponderance of hypertension and heart diseases however which was not found significant (p>0.05) with Hypertension but found significant (p<0.05) for other heart diseases excluding Hypertension. Likewise it was also observed that elderly who were doing exercise were having significantly less (p<0.001) heart diseases. It was found in this study that hypertension was observed significantly more in elderly who were smoking followed by elderly who were taking alcohol

and chewing tobacco. But proportion of heart diseases (other than hypertension) found significantly more (p<0.001) in elderly who were taking alcohol than who were smoking. Other authors also have almost similar observations and several risk factors for heart diseases: age, gender, tobacco use, physical inactivity, excessive alcohol consumption, unhealthy diet, obesity, family history of cardiovascular disease, raised blood pressure (hypertension), raised blood sugar (diabetes mellitus), raised blood cholesterol (hyperlipidemia), psychosocial factors, poverty and low educational status.[18,19,20,21]

V.   CONCLUSION

Hypertension was found in 33.58%   and other heart diseases were found in 5.43% of elderly. It was found that all other heart diseases were having hypertension. Obesity was maximal co-morbidly with heart disease followed by Diabetes. Heart diseases were found significantly more in males. Likewise it was also observed that elderly who were doing exercise were having significantly less heart diseases. Hypertension was observed significantly more in elderly who were smoking followed by elderly who were taking alcohol and chewing tobacco. But proportion of heart diseases (other than hypertension) found significantly more in elderly who were taking alcohol than who were smoking.

CONFLICT OF INTEREST

None declared till now.

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