International Journal of Community Medicine and Public Health
Junapudi SS et al. Int J Community Med Public Health. 2017 Dec;4(12):4623-4629
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20175341

Original Research Article

A comparative study of cardiovascular disease risk factors among urban and rural population South Indian city

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Received: 26 September 2017
Revised: 04 November 2017
Accepted: 07 November 2017

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ABSTRACT

Background: Non-communicable diseases are major health burden in the industrialized countries, and are increasing rapidly in developing countries like India due to demographic transition and changing lifestyles among people. Major Non communicable diseases are cardiovascular diseases, renal, nervous and mental diseases, musculoskeletal conditions, chronic non-specific respiratory diseases, permanent results of accidents senility, blindness, cancers, diabetes, obesity and various other metabolic and degenerative diseases and chronic results of communicable diseases. The aims and objectives of the study were to estimate the prevalence of cardio vascular disease risk factors among the study population above 15 years age group and to compare the study results between urban and rural area population.

Methods: A total of 1400 persons in the age group of above 15 years were interviewed at their residence and anthropometric measurements were taken. The study design was on community based cross-sectional study. The study setting was on urban health centre, Harazpenta and rural health centre, Patancheruvu. The study population was on adults above 15 years of age in Harazpenta and Patancheruvu. The sample size was 700 urban, 700 rural population. The study period was on April 2008 to May 2009 (1 year). The data collection was by using pre-designed, pretested questionnaire. The data analysis was by using MS office 2003, Epiinfo 2007. The statistical test was on rates, ratios, proportions and Chi-square tests.

Results: Smoking habit was more (19.2%) among urban population when compare to the rural (13.4%) population, alcohol use was 24%, when compared to 30.7% was alcohol use in rural area. In urban area 13.7% of population led with sedentary life, where as in rural area 3.3% only. Among urban population prevalence of obesity was 12.7% compared to 5.4% in rural population, prevalence of hypertension in urban area 18.7% and rural area 20%, In urban area prevalence of diabetes was 14.4% and in rural area.

Conclusions: Smoking habit was more (19.2%) among urban population when compare to the rural (13.4%) population, in urban area alcohol use was 24%, whereas in rural area 30.7%. In the study population 14.5% of urban males led a sedentary life style, when compared with 5.1% of males in the rural area. Among urban population prevalence of obesity was 12.7% compared to 5.4% in rural area.

Keywords: Non communicable disease, Cardiovascular disease, Risk factors, Urban area, Rural area

INTRODUCTION

Non communicable diseases are major health burden in the industrialized countries, and are increasing rapidly in developing countries like India due to demographic transition and changing lifestyles among people. Major Non communicable diseases are cardiovascular diseases, renal, nervous and mental diseases, musculoskeletal

conditions, chronic non-specific respiratory diseases, permanent results of accidents senility, blindness, cancers, diabetes, obesity and various other metabolic and degenerative diseases and chronic results of communicable diseases. Cardiovascular diseases are at present leading cause of death in developing countries like India.[1]

Cardiovascular disease (CVD) refers to the class of diseases that involve the heart and/or blood vessels (arteries and veins). While the term technically refers to any disease that affects the cardiovascular system, it is usually used to refer to those related to atherosclerosis (arterial disease).[2] Cardiovascular diseases include arteriosclerosis, coronary artery disease, heart valve disease, arrhythmia, heart failure, hypertension, orthostatic hypo tension, shock, endocarditis, diseases of the aorta and its branches, disorders of the peripheral vascular system, and congenital heart disease.[3] These conditions have similar causes, mechanisms, and treatment.

Selected risk factors

Common, preventable risk factors underlie most cardiovascular diseases. These cardiovascular risk factors are a leading cause of the death and disability burden in all countries, regardless of their economic development status. The leading risk factor globally is raised blood pressure, followed by tobacco use, raised total cholesterol, and low fruit and vegetable consumption. The major risk factors together account for around 80% of deaths from disease and stroke.

Major risk factors for cardiovascular disease identified in the World Health Report 2002 are[4]

Major behavioral risk factors

- Tobacco use
- Harmful alcohol use
- Unhealthy diet (low fruit intake and vegetable consumption)
- Physical inactivity

Major biological risk factors

- Over weight and obesity
- Raised blood pressure
- Raised blood glucose
- Abnormal blood lipids and raised total cholesterol

Rationale of the study

The strategy of modern life has led to the present situation of increase in the risk factors of cardiovascular disease. The adoption of western culture by developing countries like India, long sedentary working hours, eating spicy junk foods, smoking and alcoholism causes obesity and the absence of physical exercise has changed the normal circadian rhythm of life today. In the long run of life all these chronic factors are cresting an unavoidable risk of cardiovascular diseases in all the age groups.

There are not many studies regarding the Non-communicable disease risk factors in Hyderabad to give an accurate information. The aim of this comparative Urban and rural data collection is to create an awareness regarding the risk factors of cardiovascular disease in the rapidly growing population of Hyderabad and thereby to provide information to planners and program managers to decrease the prevalence of cardiovascular disease in the future generations of Hyderabad.

Observing international and national burden of cardiovascular diseases, we chose this study of cardiovascular disease risk factors in field practice are of our college, Osmania Medical College, Hyderabad. The aim of study was to find out any difference in distribution of risk factors between rural and urban population.

METHODS

The present study was a cross sectional study carried out in the Urban Health Center area Harazpenta, Hyderabad and Rural Health Center area, Patancheruvu, Medak district.

A Proforma was designed and pretested with pilot study at the Harazpenta and the actual study was started after making necessary corrections.

A total of 1400 persons in the age group of above 15 years were interviewed at their residence and anthropometric measurements were taken.

Study design: Community Based Cross-Sectional Study.

Study setting: Urban Health Centre, Harazpenta and Rural Health Centre, Patancheruvu.

Study population: Adults above 15 years of age in Harazpenta and Patancheruvu.

Sample size: 700 urban, 700 rural population.

Study period: April 2008 to May 2009 (1year).

Study variables

Age, sex, hypertension, diabetes-mellitus, family history, smoking, alcohol, physical inactivity, blood cholesterol, blood glucose, anthropometric measures (Ht, Wt), obesity and overweight, life style, dietary habits.

Data collection: By using pre-designed, pretested questionnaire

Data analysis: By Using MS office 2007, epiinfo2007

Statistical test: Rates, Ratios, Proportions and Chi-square tests.

Inclusion criteria: An inclusion criterion was above 15 years age group of study population.

Exclusion criteria: Exclusion criteria were pregnant women, who are already having cardiovascular disease, seriously ill persons and persons who are not willing to give consent.

Description of the study area

I) Urban health center, Harazpenta, Hyderabad

It functions under Municipal Corporation of Hyderabad, AP which is the field practice areas of Osmania Medical College; it is about 5 kms away from Osmania Medical College Hyderabad. It has 41 slums having population of 58,902. The residents of these slums are mixture of labourers, employees, students and house wives etc.

II) Rural health center Patancheruvu (Medak district)

The rural health center is placed at Patancheruvu mandal of Medak district and it caters to a population of one lakh and twenty thousand which consists of 13 villages. It is around 25 kms away from Osmania Medical College.

Selection of the slums and households

A. In urban area

Three Out of 41 slums (three slums i.e. Krishna Nagar, Sunder Nagar and Nehru Nagar) were selected for study by simple random sampling. Every third house hold was selected. A total of 700 respondents of above 15 years age group were interviewed at their residence.

The interview was conducted by the investigator after taking informed consent from all the study subjects after explaining the purpose and general objectives of the study, keeping in mind their level of understanding.

The study subjects were interviewed with pre-tested proforma and anthropometric measurements, blood pressure were recorded and also health education was given to them at the end of the interview.

B. In rural area

Rural health centre, Patancheruvu is a mandal under Medak district and caters to a population of one lakh twenty thousand which consists of 13 villages. Out of 13 villages 3 villages were selected for study by random method.

Selection of households

In a village after reaching the center of the village, numbering was given to each house hold from centre to periphery. Then reached the north of the village and started the house hold survey. Starting from 3rd house onwards and the subjects above 15 years were interviewed with pretested proforma and their anthropometric measurements were taken and moved on to next house i.e., 3+3= 6th house and so, till the required sample size was attained.

The same procedure was adopted in the other two villages.

Calculation of sample size

Tobacco use, alcohol use, unhealthy dietary habits, lack of physical activity, over weight and obesity, hypertension, diabetes and hyperlipidaemia are major risk factors for cardiovascular disease.

Among these risk factors the prevalence of Diabetes is the least in Andhra Pradesh according to a study by Chow et al "Prevalence and management of diabetes in India" where prevalence of diabetes in Andhra Pradesh was 13.2%. Hence this prevalence was used to calculate the sample size.[5]

Using this prevalence of diabetes in Andhra Pradesh was calculated the sample size with the following formula:

$4\ PQ / L^2$ (L=20%, P=13.2% and Q= 1-P)

Where L=allowable error, P=prevalence,

Calculated sample size = 4×13.2×86.8 / 2.64×2.64=658

Estimated sample size is 658 which was rounded to 700. The total study subjects in the urban area was 708 and in the rural area 701.

RESULTS

Tobacco use

In the study population smoking habit was more (19.2%) among urban population when compare to the rural (13.4%) population was found to be statistically significant ($X^2 = 8.67$, $p<0.00032$, CI=95%) (Table 1).

Alcohol use

In the present study in urban area alcohol use was 24%, when compared to 30.7% were alcohol use in rural area. The difference was statistically significant ($\chi^2=7.87$, $p<0.005$, CI=95%) (Table 2).

Physical activity

In urban area 13.7% of population led with sedentary life, where as in rural area 3.3% only. This difference was found to be statistically significant ($\chi^2=48.38$, $p<0.00001$, CI=95%) (Table 3).

Table 1: Distribution according to prevalence of current smokers in the study population.

Current smoker	Urban (n=708)		Rural (n=701)		Total (n=1409)	
	N	%	N	%	N	%
Yes	136	19.2	94	13.4	230	16.3
No	572	80.8	607	86.6	1179	83.7
Total	708	100	701	100	1409	100

Table 2: Distribution of alcohol use in the study population.

Alcohol use	Urban (n=708)		Rural (n=701)		Total (n=1409)	
	N	**%**	**N**	**%**	**N**	**%**
Yes	170	24.0	215	30.7	385	27.3
No	538	76.0	486	69.3	1024	72.7
Total	708	100	701	100	1409	100

χ^2=7.87, p<0.005, CI=95%.

Table 3: Distribution of sedentary activity in the study population.

Physical activity	Urban (n=708)		Rural (n=701)		Total (n=1409)	
	N	**%**	**N**	**%**	**N**	**%**
Sedentary	98	13.7	24	3.3	122	8.6
Non sedentary	610	86.3	677	96.7	1287	91.4
Total	708	100	701	100	1409	100

χ^2=48.38, p<0.00001, CI=95%.

Table 4: Prevalence of overweight and obesity in study population.

Area	Under weight (BMI <18.5) (%)	Normal weight (BMI 18.55-24.99) (%)	Pre obese (BMI 25-29.99) (%)	Obese (BMI>30) (%)	Total (%)
Urban	80 (11.3)	382 (54)	156 (22.0)	90 (12.7)	708 (100)
Rural	72 (10.2)	452 (64.6)	139 (19.8)	38 (5.4)	701 (100)
Total	152 (10.7)	834 (59.1)	295 (20.9)	128 (9.3)	1409 (100)

χ^2=22.67, p<0.00001, CI=95%.

Table 5: Area wise distribution of hypertension in the study population.

Hypertension	Urban (n=708)		Rural (n=701)		Total (n=1409)	
	N	**%**	**N**	**%**	**N**	**%**
Present	134	18.7	143	20	277	19.6
Not present	574	81.3	558	80	1132	80.4
Total	708	100	701	100	1409	100

χ^2=0.48, p>0.051, CI=95%).

Table 6: Area wise distribution of diabetes among study population.

History of Diabetes	Urban (n=708)		Rural (n=701)		Total (n=1409)	
	N	**%**	**N**	**%**	**N**	**%**
Present	103	14.4	75	10.5	178	12.6
Not present	605	85.6	626	89.5	1231	87.4
Total	708	100	701	100	1409	100

χ^2=4.73, p<0.029, CI=95%).

Overweight and obesity

Among urban population prevalence of obesity was 12.7%compared to 5.4% in rural population, this difference was found to be statistically significant (χ^2=22.67, p<0.00001, CI=95%) (Table 4).

Over weight was 22% in urban population, 19.8% in rural population, but this difference was statistically not significant (χ^2=1.03, p<0.30, CI=95%).

Over weight and obesity (BMI>25) in urban area was 34.7% and rural area was 25.1%, and this difference was

found to be statistically significant (χ^2=15.12, p<0.0001, CI=95%).

Overall prevalence of overweight and obesity (BMI>25) in the study group was 30%.

Hypertension

Prevalence of hypertension in urban area 18.7% and rural area 20% the difference was statistically not significant (χ^2=0.48, p>0.051, CI=95%) (Table 5).

Diabetes

In urban area prevalence of diabetes was 14.4% and in rural area 10.5% this difference was found to be statistically significant (χ^2=4.73, p<0.029, CI=95%) (Table 6).

DISCUSSION

The present study results (Table 1) were comparable to studies conducted by Mohmad where the overall prevalence of smoking was 18.1%.[6] In a study conducted by Mehan et al have noted that prevalence of smoking was 13.6%.[7] When compared to present study results the prevalence of tobacco smoking was more in the fallowing studies- a study conducted by Suganthan et al, among adults in Kerala over all current smokers were 40%.[8] A study by Shah et al have noted that daily smokers were highest in Ballabgarh (rural 50% and slums 44%) In the present study the prevalence of smoking habits was in urban area than in rural area.[9] This may be due to the social acceptance of these habits in their community where they dwell and these habits are a part and parcel of their life style.

In the present study (Table 2) in urban area alcohol use was 24%, when compared to 30.7% were alcohol use in rural area. The difference was statistically significant (χ^2=7.87, p<0.005, CI=95%). In the study by Chavan et al "have noted that in urban slums, 10.7% of population was dependent while in rural area only 3.12% were dependent.[10] In rural area consumption of alcohol was high when compared to urban area, this may be due to that they are thinking that it acts as a medicine to relive body pains and numbness. They are consuming alcohol in the form of Thadi and Gudumba they are cheap.

In urban area (Table 3) 13.7% of population led with sedentary life, where as in rural area 3.3% only. This difference was found to be statistically significant (χ^2=48.38, p<0.00001, CI=95%). The present study results were differ with a study done by Mehan et al in urban population of India have noted that 86.8% were sedentary at work.[11]

Among urban population (Table 4) prevalence of obesity was 12.7% compared to 5.4% in rural population, this difference was found to be statistically significant (χ^2=22.67, p<0.00001, CI=95%). Over weight was 22% in urban population, 19.8% in rural population, but this difference was statistically not significant (χ^2=1.03, p<0.30, CI=95%).Over weight and obesity (BMI> 25) in urban area was 34.7% and rural area was 25.1%, and this difference was found to be statistically significant (χ^2=15.12, p<0.0001, CI=95%). Overall prevalence of overweight and obesity (BMI>25) in the study group was 30%. Our study results was comparable to studies conducted by- a study by Sood et al in an epidemiological study of obesity in Simla town. Prevalence of obesity was 34.7% among urban area using cut off level BMI >25.[12] A study done by Reddy et al among a cross-sectional population of Andhra Pradesh have noted that prevalence of obesity was 36%.[13] In a report called priority non-communicable disease-Health situation in the South East Asia region-1998-2000- WHO: 135" it was seen that the prevalence of obesity (BMI>25) in urban areas of India is ranged between 20-40%.

Prevalence of hypertension (Table 5) in urban area 18.7% and rural area 20% the difference was statistically not significant (χ^2=0.48, p>0.051, CI=95%). A study done by Reddy et al (A.P"s urban & rural population-2001) shows that the prevalence of hypertension was about 28%.[14] In the present study prevalence was only 19.6%. Where as in a study done by Rani et al showed that the overall crude prevalence of hypertension was 21.1% this study results were nearer to present study prevalence of hypertension was 19.6%.[15] A study by Mehan, Srivastava et al have note that history of hypertension was 15.5%.[7] A study done by Gupta SP, Siwach SB have noted that hypertension was found almost twise in the urban than rural group.[16]

In urban area prevalence of diabetes (Table 6) was 14.4% and in rural area 10.5% this difference was found to be statistically significant (χ^2=4.73, p<0.029, CI=95%). A similar findings was noted by Mehan et al, in their study "Profile of non-communicable disease risk factors in an industrial setting." have noted that prevalence of diabetes was 19.1% in urban area.[7] In the study by Chow, Raju et al the prevalence and management of diabetes in rural India was 13.2%.[12] When compared to the present study prevalence was more in a study done by Krishnareddy et al prevalence of risk factors for CAS, among a cross-sectional population of A.P, India.[14] Have noted that overall prevalence of diabetes was 24%. When compared to the present study prevalence was less in a study by Gupta, et al. Diabetes prevalence and its risk factors in urban Pondicherry, have noted that prevalence of diabetes in urban area of Pondicherry was 8.27%.[13] A study done by Deo et al to identify the risk factors for high prevalence of diabetes and impaired glucose tolerance in Indian rural population have noted that prevalence was 9.3%.[17]

CONCLUSION

Total study population was 1409, out of this 708 study subjects were from urban area and 701 from rural area. Smoking habit was more (19.2%) among urban

population when compare to the rural (13.4%) population this was found to be statistically significant (χ^2=8.67, p<0.00032, CI=95%). Both in urban and rural area smoking habits were higher in males.

In urban area alcohol use was 24%, whereas in rural area 30.7%. It was found that prevalence of alcohol use was high among lower class in both urban and rural areas (45.4% and 71.4%).

In the study population 14.5% of urban males led a sedentary life style, when compared with 5.1% of males in the rural area. In the study population 27.2% individuals who had sedentary lifestyle were belonging to lower class in urban area, where as in rural area 5.5% among urban population prevalence of obesity was 12.7% compared to 5.4% in rural area. In the study population 42.9% of the individual who had BMI>25 were from upper middle class in urban area, when compared to 43.3% with BMI>25 belongs to upper class in rural area. The prevalence of hypertension was more in females in both in urban and rural areas (22.6% and 26.4%). The prevalence of hypertension was more in widow/widowers in both urban and urban areas. The overall prevalence of diabetes was 12.6% in the study population. The prevalence of diabetes is more among males both in urban (16.4%) and rural (14.4%) areas.

Recommendations

- Ill effects of smoking should be explained to the smokers and counselling should be given to them. Prevention of smoking should be known to them right from childhood.
- The existing law that is prohibition of smoking at places should be implemented strictly.
- Prohibition of alcohol should be implemented at least at working places.
- De addiction centers should be established at government level.
- Lack of physical activity observed more in urban area than the rural area therefore physical exercise should be encouraged in urban area like simply walking and using of cycling.
- All over weight and obese subjects should be educated to know about the occurrence of various health problems due to overweight.
- To bring awareness among the family members of overweight/obesity subjects by way of providing health education to them.
- IEC activity should be strengthened and health education should be given through health centers.
- Awareness should be created for regular health checkups and monitoring of blood pressure through mass media.
- Regular health checkups and screening should be done among the people who have family history of diabetes.
- Treatment should be continued as per the doctor's advice.
- All diabetic patients must go for regular checkups for presence of any complications.
- Health education should be given to the patents and family members to prevent complications.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Junapudi SS, Rao BB. A comparative study of cardiovascular disease risk factors among urban and rural population South Indian city. Int J Community Med Public Health 2017;4:4623-9.