Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 06, 2024

Risk Factors of Coronary artery disease patients with underlying cardiac disease _cross sectional study.

Premkumar [1] , Suresh MK [2] , Meghna Annie Philip [3]

1.Postgraduate Student, Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India.
2. Professor, Department of General Medicine, Sree Mookambika Institute of Medical Sciences Kanyakumari, Tamil Nadu, India.
3.Postgraduate Student, Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

Corresponding Author: Dr.Premkumar Postgraduate Student, Department of General Medicine Sree Mookambika Institute of Medical Sciences College Kanyakumari, Tamil Nadu, India

Abstract

Objective:
To analyse the risk factors in patients with established CAD in urban and rural population.
Material and methods:
A cross-sectional study of all patients with IHD coming to cardiology opd areas presenting with known or suspected IHD with chest pain suggestive ofIHD and various investigations suggestive of IHDhave been screened. Patients with evidence of CAD on coronary angiogram have been included in the study.
Results:
Total 500 subjects were included in the study. Male patients were 76% and Female 24%.Risk factor for Coronary Artery disease (CAD), such as Physical inactivity, Diabetes, Dyslipidemia and Hypertension were more prevalent inurban population than rural. Obesity is more common in urban population than rural population though not statistically significant. Family History of IHD is equally prevalent between urban and rural population. Smoking is more common among rural population.
Conclusion:
Our preventive measures should focus on modifying risk factors such as Physical inactivity, Diabetes, Hypertension,Dyslipidemia, Obesity and Smoking in urban and rural population.
Key words:BMI- Body Mass Index, CAD-Coronary artery disease,CVD-Cardiovascular disease, IHD-Ischemicheart disease.

Introduction:
Nearly 60% of deaths in India are due to Non-communicable diseases.Among Non-communicable diseases CAD is one of the major cause[1, 2]. CAD accounts for 15.5% of total deaths globally[3,4]. In India, CAD accounted for 26.9% of medically certified deaths in 2015 and 1,200,000 deaths in

2012[5,6]. However, these figures are likely underrated when compared to the real situation due to the absence of consistent mortality data, non-accounting of silent myocardial infarctions and asymptomatic CAD deaths[7].

InIndia there was a two and a sixfold increase in CAD in rural areas and in urban areas respectively from 1960 to 2002 and CAD has been considered to be of epidemic proportion in India[8]. The systematic review done by Rao et al. demonstrated that prevalence of CAD in urban areas was 2.5–12.6% and in rural areas, 1.4–4.6%. Moreover, they concluded that the high prevalence of CAD risk factors, treatment delays and suboptimal use of evidence based treatment when managing CADs are common in India[9, 10, 11].

India accounts for more than one-fifth of total CVD deaths, according to WHO study,and therefore reduction of global cardiovascular mortality greatly depends on India, where cardiovascular disease develops a decade earlier in life than in high-income countries[12].

CAD and coronary risk factors were two or three times higher among the urban patients compared with the rural patients, which may be due to greater sedentary behaviour in the urban population[12].

The relatively low level of conventional risk factors in the rural populations presents a window of opportunity for different preventive Strategies. Givingmore importance to balanced vegetarian diet, increasing the levels of physical activity, and cessation of smoking would be crucial in containing the rise of risk factors and CAD prevalence induced by urbanization and industrialization[12].

Objective:

To analyse the risk factors in patients with established CAD in urban and rural Indian population.

Sample size: 500 Subjects

Material and methods:

A cross-sectional study of all patients with CAD coming to cardiology opd at sree mookambika institute of medical sciences presenting with known or suspected IHD with chest pain suggestive of IHD and various investigations suggestive of IHD. Patients with evidence of CAD on coronary angiogram were included in the study.

Definition of study population:

1. Urban and Rural population were defined according to census of India data[13].
2. Coronary artery disease (CAD)[14]:defined as per WHO cardiovascular survey methods criteria.
3. Hypertension[15]: defined as per 2020 International Society of Hypertension Global Hypertension PracticeGuidelines.
4. Diabetes mellitus[16]: according toClassification and Diagnosis of Diabetes: Standards of Medical Care inDiabetes2020
5. Body mass index[17]: Body mass index (BMI) was calculated as weight in kg divided by square of height in
   metres and overweight and obesity defined as BMI ≥25kg/m^2.

6. Dyslipidemia[18]:2018AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/ PCNA guideline on the management of blood cholesterol
7. Physical inactivity[17]: Adults (≥ 18 years): Not achieving 150 min of moderate-to-vigorous-intensity physical activity per week or 75 min of vigorous-intensity physical activity per week or an equivalent combination of moderate- and vigorous-intensity activity.
8. Tobacco consumption[19]: Users of all types of tobacco products and present and past smokers have been included in smoker category. The diagnostic criteria for tobacco use as well as other coronary risk factors adopted were in accordance with American College of Cardiology clinical data standards.
9. Family History of CAD[20]: People with one or more close relatives who have or had early coronary artery disease (CAD) are at an increased risk for CAD. For men, early CAD is being diagnosed before age 55 years. For women, early CAD is being diagnosed before 65 years.

Inclusion criteria:

Patients with Coronary angiogram confirmative of CAD were included.

Exclusion criteria:

Patients with Coronary angiogram not confirmative of CAD were excluded.

Number of vessels diseased[21]: The number of diseased vessels is measured according to coronary artery surgerystudy (CASS) criteria.

Ethics Committee:

Ethics committee approval was taken from Sri.Jayadeva Institute of Cardiovascular Sciences and Research, Mysore.

Statistical Analysis:

The data were entered in Microsoft Excel sheet and appropriate tests like chi-square, ‘t’-test and ANOVA were applied .In all the above test P value less than 0.05 were taken to be statistically significant. The data was analyzedusing SPSS package.

Results:

Total 500 subjects were included in the study and mean age of the study population was 53.51 yrs. Male patients constituted 76% and Female patients 24% of total study population.

Table1:Age distribution of the study subjects.

	RURAL (n=250)		URBAN (250)		Total	
Age	**Numbers**	**Percentage**	**Numbers**	**Percentage**	**Numbers**	**Percentage**
<31	**6**	**2.4%**	**5**	**2.0%**	**11**	**2.2%**
31-40	**37**	**14.8%**	**34**	**13.6%**	**71**	**14.2%**
41-50	**58**	**23.2%**	**69**	**27.6%**	**127**	**25.4%**
51-60	**79**	**31.6%**	**77**	**30.8%**	**156**	**31.2%**
61-70	**51**	**20.4%**	**52**	**20.8%**	**103**	**20.6%**
71-80	**16**	**6.4%**	**13**	**5.2%**	**29**	**5.8%**
>81	**3**	**1.2%**	**0**	**0.0%**	**3**	**0.6%**
Total	**250**	**100.0%**	**250**	**100.0%**	**500**	**100.0%**

Table2: Sex Distribution of the study subjects.

	RURAL (n=250)		URBAN (250)		Total	
Gender	**Numbers**	**Percentage**	**Numbers**	**Percentage**	**Numbers**	**Percentage**
FEMALE	**60**	**24.0%**	**66**	**26.4%**	**126**	**25.2%**
MALE	**190**	**76.0%**	**184**	**73.6%**	**374**	**74.8%**
Total	**250**	**100.0%**	**250**	**100.0%**	**500**	**100.0%**

Risk factor for Coronary Artery disease (CAD), such as physical inactivity, Diabetes, Dyslipidemia and Hypertension were more prevalent in urban population than rural. Obesity is more in urban population than rural though not statistically significant. Family History of CAD is equally prevalent between urban and rural population.Smoking is more common among rural population.

Table3: Risk factors distribution among study subjects

Risk Factors	**RURAL (n=250)**		**URBAN (250)**		**Total**	**Pearson Chi-Square**
BMI (>25)	**62**	**25%**	**75**	**30%**	**137**	**.192**
DM	**72**	**29%**	**101**	**40%**	**173**	**.006**
HTN	**70**	**28%**	**100**	**40%**	**170**	**.005**
Smoking	**78**	**31%**	**65**	**26%**	**143**	**.198**
F/H of CAD	**74**	**30%**	**75**	**30%**	**149**	**.922**
Dyslipidemia	**123**	**49%**	**146**	**58%**	**269**	**.039**
Physical inactivity	**52**	**21%**	**93**	**37%**	**145**	**.000**

Coronary Angiogram Pattern:

Number of vessel disease 0 and 1 is more common among rural population, where as 2 and 3

are more common inurban population. Suggestive of More severe disease in urban population compared to rural population.

Table4: Coronary Angiogram Pattern among study subjects.

No. of disease Vessels	RURAL (n=250)		URBAN (250)		Total	
0	31	12.4%	15	6.0%	46	9.2%
1	119	47.6%	94	37.6%	213	42.6%
2	55	22.0%	65	26.0%	120	24.0%
3	45	18.0%	76	30.4%	121	24.2%
Total	**250**	**100.0%**	**250**	**100.0%**	**500**	**100.0%**

DISCUSSION:

Total 500 subjects were included in the study and mean age of the study population was 53.51 yrs. Male patients constituted 76% and Female patients 24% of total study population.Xavier D et al[22]in their study Mean age of the patients was 57 years which is comparable to our study. Most of our patients were in 51-70 years age group(51.8%) comparable to that shown by Xavier D et al[22](56.7%).

In our study males comprised 74.8%, which is comparable to 76.4% males in a study by Xavier D et al[22]

In our study Risk factor for Coronary Artery disease (CAD), such as Physical inactivity, Diabetes, Dyslipidemia and Hypertension were more prevalent in urban population than rural. Obesity is more common in urban population than rural population though not statistically significant. Other risk factors were equally prevalent between urban and rural. Smoking was more common among rural population.

In a study by Rajith KS[23] et al obesity as indicated by BMI ≥ 25 kg/m2 and sedentary life style, was more in the city population than in the rural study populations, while smoking was more common among rural population. Other risk factors like diabetes mellitus, hypertension, family history of CAD, and Dyslipidemia was equally prevalent among the city, urban and rural population.

Number of vessel diseased 0 and 1 is more common among rural population,where as 2 and 3 are more common in urban population. Suggestive of More severe disease in urban population compared to rural population.In a study by Rajith KS etal[23] Number of vessels diseased,3 vessel disease was less in rural populationcompared to other groups. Quality of life' is significantly playing a major role in the causation of CHD. Most of the men &women are working in agriculture in rural and involving heavy physical activity. While most of the urban men and women have sedentary habits as shown by Chadaet al[24].

Recent studies have concluded that the rates of CHD, hypertension, diabetes, dyslipidemia and obesity are low among the rural population of India, and high in urban population[25]. The lifestyle in the rural is still traditional. Vegetariandiet and not much fried food is consumed. Further, agricultural work demands strenuous physical activity and leaving little room for obesity.

Traditional way of life is advisable in order to prevent risk factors of CHD. In spite that smoking is more common inthe rural population; the prevalence is lower than urban population. Lack of

physical activity and consumption of more food resulted in higher level of obesity, dyslipidemia, diabetes and hypertension[25].

Conclusion:

Coronary artery risk factors such as Physical inactivity, Diabetes, Hypertension and Dyslipidemia are more commonin urban population. Obesity is more in urban population than rural though not statistically significant. Family History of CAD is equally prevalent between urban and rural population. Smoking is more common among rural population. Our preventive measures should focus on modifying risk factors such as sedentary life style, Diabetes, Hypertension, Dyslipidemia, Obesity in urban and Smoking in rural population.

References

1. *Bodkhe S, Jajoo SU, Jajoo UN, Et al, Epidemiology of confirmed coronary heart disease among population older than 60 years in rural central India—A community-based cross-sectional study, Indian Heart J, Vol. 71, 2019, pp. 39-44.*
2. *Prabhakaran D, Jeemon P, Roy A, Cardiovascular diseases in India: current epidemiology and future directions, Circulation, Vol. 133, 2016, pp. 1605-20.*
3. *Sekhri T, Kanwar RS, WilfredR,et al., Prevalence of risk factors for coronary artery disease in an urban Indian population, BMJ Open, Vol. 4, 2014. e005346.*
4. *World Health Organization (WHO), Global Health Observatory (GHO) Data, World Health Organization, Geneva, Switzerland, Vol. 3, 2015. (Retrieved 23, 2015).*
5. *Roth GA, Johnson CO, Abate KH, Abd-Allah F, Ahmed M, et al., Global Burden of Cardiovascular Diseases Collaboration, The burden of cardiovascular diseases among US states, 1990-2016, JAMA Cardiol, Vol. 3, 2018, pp. 375-89.*
6. *World Health Organization (WHO), Global health estimates: deaths by cause, age, sex and country, 2000-2012, World Health Organization, Geneva, Switzerland, Vol. 9, 2014.*
7. *Ahmad N, Bhopal R, Is coronary heart disease rising in India? A systematic review based on ECG defined coronary heart disease, Heart, Vol. 91, 2005, pp. 719-25.*
8. *Krishnan MN, Zachariah G, Venugopal K, Mohanan PP, Harikrishnan S, SanjayG, et al., Prevalence of coronary artery disease and its risk factors in Kerala, South India: a community-based cross-sectional study, BMC CardiovascDisord, Vol. 16, 2016, pp. 12.*
9. *GuptaR,JoshiP,Mohan V, Reddy KS, Yusuf S, Epidemiology and causation of coronary heart disease and stroke in India, Heart, Vol. 94, 2008, pp. 16-26.*
10. *BhardwajR,KandoriaA,Marwah R, Et al, Coronary heart disease in rural population of Himachal—a population based study, J AssocPhys India, Vol. 57, 2009, pp. 505-7.*
11. *Rao M, Xavier D, Devi P, Sigamani A, Faruqui A, Gupta R, et al., Prevalence, treatments and outcomes of coronary artery disease in Indians: a systematic review, Indian Heart J, Vol. 67, 2015, pp. 302-10.*
12. *Bahl V K, Prabhakaran D, Karthikeyan G, CAD in Indians; Indian Heart J, 2001;53;707-713*
13. *Census of India : internet; www.censusindia.gov.in ; Census Data Summary 2011 ; Metadata.*
14. *Rose G, Blackburn H, Gillum RF, et al. Cardiovascular survey methods, Geneva, World Health Organization,1982.*
15. *Unger T, Borghi C, Charchar F, et al. 2020 International Society of Hypertension Global Hypertension Practice Guidelines.Hypertension. 2020;75:1334-1357*
16. *Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes2020, Diabetes Care 2020;43(Suppl. 1):S14–S31*
17. *WHO. Global Recommendations on Physical Activity for Health. Geneva: World Health Organization; 2010.*
18. *GrundySM,StoneNJ,BaileyAL,2018AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASP C/NLA/ PCNA guideline on the management of blood cholesterol: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines.*

Circulation. 2019;139:e1046– e1081

19. *Gupta R, Sarna M, Thanvi J, et al. High prevalence of multiple coronary risk factors in Punjabi Bhatia community: Jaipur Heart Watch-3. Indian Heart J 2004;56:646–52.*
20. *Vallapuri S, Gupta D,TalwarKK,et al, Comparison of Atherosclerotic Risk Factors in Asian Indian and American Caucasian Patients With Angiographic CAD: The American Journal Of Cardiology, VOL. 90 , 2002; 1147-1150.*
21. *Ringqvist , Fisher LD, Mock M, et al. Prognostic value of angiographic indices of CAD from the coronary artery surgery study (CASS). J. Clin. Invest. 1983;71:1854 – 1866.*
22. *Xavier D, Pais P, Devereaux PJ, et al; CREATE registry investigators. Treatment and outcomes of acute coronary syndromes in India (CREATE): a prospective analysis of registry data. Lancet. 2008;371(9622):1435-42*
23. *Rajith K S,HarshaBasappa ,RameshSS.Coronary artery disease risk factors distribution in cities versus urban and rural population of Karnataka. J. Preventive Cardiology; Feb 2017,Volume 6:No 3:947-950*
24. *Chadha S L, Gopinath N, Shekhawat S.; Urban - rural differences in the prevalence of coronary heart disease and its risk factors in Delhi : Bulletin of the World Health Organization, 1997, 75 (1): 31-38*
25. *Gupta R, Rastogi S, Panwar RB, et al. Major coronary risk factors and coronary heart disease epidemic in India. S Asian J PrevenCardiol 2003;7:11–40*