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Determinants of Cardiovascular Diseases among Patients Admitted at Cardiology Department of a Tertiary Care Hospital, Jharkhand: A Cross sectional Study

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Abstract:
Background: *In today's world around 36 million deaths are due non communicable diseases (NCD) of which around 17 million are due to cardiovascular diseases (CVD). More significantly nearly one third of deaths occurs in middle aged groups. This study tries to find out risk factors leading to CVD.*
Aims and objectives *:(1) To study the socio demographic profile of patients and life style related risk factors that causes CVD among patients admitted in cardiology department, RIMS.*
Methodology: Study design: *Hospital based cross sectional study.* ***Place of study:****Cardiology inpatient department, RIMS.* ***Duration of study****: July-August, 2017. Sample size: 147.****Sampling technique:****Consecutive sampling.* ***Data collection****: pretested questionnaire.*
Results: *Around 2/3rd of the patients were males with more than above 65 years. Maximum of 63 % of them were retired or unemployed. Around 60 % of participants were sedentary workers and around 2/3rd of the participants slept less than 8 hours a day.Alcoholics and smokers were found to be at higher risk. Of allnon-vegetarians constituted more than half of the cases and those using Vanaspati as cooking media were at higher risk. Maximum of the participants (73.5%) had hypercholesterolemia, out of which many (47.22%) were hypercholesterolemic for more than 5 years.*
Conclusions*: Disease occurred in majority of people belonging to urban areas, who were either retired/unemployed or were leading a sedentary life. Smoking also contributed maximally in occurrence of CVD.*
Nearly half of the patients were alcohol consumers and disease occurred maximum in chronic alcoholics. Majority of the patients were non vegetarians and consumed increased amount of saturated fats. Owing to this most of them were hypercholesterolemic. Hypertensives and diabetics were more prone to develop CVD.
Key words: *Cardiovascular disease, NCD, Diabetes, Hypertension, Sleep pattern*

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I. Introduction:

Today with the advent of time andimprovement of health facilities, we seem to have gained some success in our fight with communicable diseases. But still the hood which a new form of diseases called as non-communicable(NCD)diseases is spreadingis alarming. Both developing and developed countries are facing the grimacing of NCD. Of all NCD the share of cardiac problems is significant.

In present scenario most of the deaths are due to NCD (36 millions) and of which nearly half of the deaths are result of cardio vascular diseases (CVD). More alarming fact is that of these nearly a third of deaths occur in middle aged groups.[1] The shift of NCD is coming towards developing countries with death due to it rising by 70% at the end of 2020.In developed countries heart diseases and stroke are the first and second leading causes of deaths in adults respectively.[2]

The CVD carries with it a high risk of morbidity andmortality. As far as morbidity is concerned, it comprises of about 25% of Disability Adjusted Life years (DALY) loss due to NCD in South East Asian Region (SEAR) countries.[1]

India is not aloof from the gruesome threat of this CVD. Approximately 46.4 million people had CVD in 2010 and around 2.33 million died of it in 2008. Compared to all other countries, India suffers the highest loss in potentially productive years with substantial deaths due to it in age group 35-64 years.[1] According to a

study,Ischemic heart disease (ID) was estimated to be at 96.7 per thousand in urban areas and 27 per thousand in rural areas.[3]

CVD consists of different pattern of the diseases comprising of IHD, hypertension (HTN), stroke, coronary heart disease (CHD) and rheumatic heart disease. IHD is due to impairment of heart function due to inadequate blood flow to it, either due to obstruction or inadequate pumping of heart. It manifests as angina, myocardial infarction, cardiac failure and sudden death. IHD causes 25-30% deaths in industrialized nations.

Though the CVD has multi factorial causation but to far extent if the risk factors can be averted then CVD can be prevented. Dramatically changing life style, increased junk and fatty food consumption, alcohol and smoking are major risk factors. Cigarette smoking is responsible for CHD deaths under 65 years and is the most important cause of sudden death in less than 50 years age group.[4-6]Sedentary life style, type A personality, oral contraceptives use and certain genetic factors poses the risk of CVD. Diabetes poses 1-3 times higher risk of CHD and high cholesterol level also threatens the life.[4-6]

As we see that the CVD is multifactorial and it is imperative for us to understand the risk factors associated with it. A better understanding of risk factors especially associated with life style would help us devise a primary preventive strategy to avoid the NCDs.

AIMS AND OBJECTIVES: (1)To study the socio demographic profile andlife style related risk factors that cause cardiovascular disease among patients admitted at cardiology department, RIMS, Ranchi.

(2) To evaluate the percentage contribution of different life style related etiological factors to the overall burden of the disease and the duration of specific factors before the onset of the disease.

II. Materials And Methods:

A hospital based cross sectional study was carried out at inpatient ward of the cardiology department of RIMS, Ranchi. The duration of the study was of 2 months (July-August 2017). All the adult patients admitted in the ward and among those who consented were included in the study. A semi structured questionnaire pertaining to life style behavior was used to collect the data. In most of the participants the questionnaire were administered to themselves, whereas for the seriously ill patients the care givers were the respondents. A total of 147 patients participated in the study. Data entry was done in M.S Excel software and analysis was performed in Epi info.

Ethnic consideration: Purpose of seeking information was explained in detail and written consent was taken from each before interviewing. Confidentiality of data was maintained.

III. Observations And Results

A total of 165 patients were admitted during the study period of which 147 consented for the participation and hence were included in our study. Around two-third of the patients were males mostly of geriatric age group. Most of the admitted person were from the urban areas and belonged to Class I and II of B.G. Prasad classification. Around 64% of them were either unemployed or retired, highlighting the fact that physical inactivity has a greater propensity for CVD.

Table 1:- Socio-demographic characteristicsof study participants. (n=147)

Characteristics		Frequencies (n)	Percentage#
Sex	Male	93	63.27
	Female	54	36.73
Age (years)	20-30	0	0.00
	31-40	12	8.16
	41-50	18	12.25
	51-60	33	22.25
	>60	84	57.14
Place of Residence	Urban	117	79.60
	Rural	30	20.40
Ethnicity	Tribal	24	16.30
	Non Tribal	123	86.70

Education	Illiterate	6	4.10
	Primary	54	36.70
	Secondary	54	36.70
	Higher secondary	18	12.30
	Graduate and above	15	10.20
Occupation	Unemployed/retired	93	63.30
	Agriculture/laborer	15	10.20
	Employed Public/Private	18	12.20
	Housewife	21	14.30
Socio-economic Status (Modified B.G Prasad classification)	Class 1	45	30.62
	Class 2	75	51.02
	Class 3	21	14.28
	Class 4	6	4.08
	Class 5	0	0.00

[#] Percentage are column percentages. That is, percentages should be read across each column.

Majority of the participants were male, more than 60 years of age, residing in non-tribal area, educated up to primary and secondary level, unemployed or retired and belonging to class 2 socio economic status. (Table 1).

Table 2: Distribution of participants according to physical activity and sleep duration

Characteristics		Frequencies	Percentage[#]
Physical Activity	Sedentary	87	59.20
	Moderate	39	26.50
	heavy	21	14.30
Sleep duration	< 8 hrs	87	59.20
	≥ 8hrs	60	40.80

[#] Percentage are column percentages. That is, percentages should be read across each column.

Around 60% of the participants were leading a sedentary life and they have a disturbed sleep pattern, mostly maybe due to stress. This has a deleterious effect on their body and have become more prone to develop CVDs. (Table 2)

Table 3: Risk factors profile of participants according to smoking pattern and alcohol consumption

Smoking pattern (n=147)		**Frequency**	**Subjects**	**Percentage[#]**
Yes - 78 (53.10%)	(Number of cigarettes/day)	<10	15	19.30
		10 - 20	21	26.90
		>20	42	53.80
	Total		78	100
	Duration(in years)	<5	9	11.54
		5 - 10	3	3.85
		10 - 15	9	11.54
		15-20	15	19.23
		>20	42	53.84
	Total		78	100
No - 69 (46.90%)	Never		45	65.21

	Past	24	34.79
	Total	69	100

Alcohol consumption (n=147)		**Frequency**	**Subject**	**Percentage[#]**
Yes - 69 (46.93%)	Frequency	Daily	30	43.47
		Weekly	24	34.79
		occasionally	15	21.74
	Total		69	100
	Duration (in years)	<5	6	8.69
		5 - 10	9	13.09
		10 - 20	15	21.73
		15-20	9	13.04
		>20	30	43.47
	Total		69	100
No - 78 (53.07%)	Never		12	15.38
	Past		66	84.62
	Total		78	100

[#] Percentage are column percentages. That is, percentages should be read across each column.

Table 3 shows that 53.10%were present smokers, out of which greater number (42.30%)smoked more than 20 cigarettes/day and about 53.84% of the present smokers smoked chronically i.e. for more than 20 years. Almost half of the participants(47%) were present alcoholics, out of which (43.47%) consumed alcohol daily and about 43.47% consumed alcohol chronically i.e.for more than 20 years.Even among those participants who did not consume alcohol presently,majority(84.62%) reported of consuming alcohol in the past.

Table 4: Dietary habits of participants**.**

Type of Diet		Subjects	Percentage[#]
Vegetarian		12	8.2
Non-vegetarian(Red meat consumer)	Daily	24	21.05
Regular (102) 69.40%	Weekly	63	55.26
Occasional (33) 22.40%	Monthly	27	23.69
	Red meat non-consumer	21	15.56

Variable		Frequency	Percentage[#]
Fruits and vegetable consumption	Occasional	84	57.14
	Frequent	63	42.86
Oil	Dalda	45	30.64
	Refined oil	36	24.48
	Mustard oil	36	24.48
	Others	30	20.4
Extra salt	Take	75	51.02
	Don't take	72	48.98

[#] Percentage are column percentages. That is, percentages should be read across each column.
Table 4 shows that most of the participants who were non-vegetarian about (84.44%)were red meat consumers, out of which greater number (55.26%) consumed red meat weekly.
Out of total 147 participants, 99 were overweight-obese, 42 had normal BMI and only 6 were underweight.(Figure 1).

Figure 1: Distribution of BMI of Participants (According to WHO)

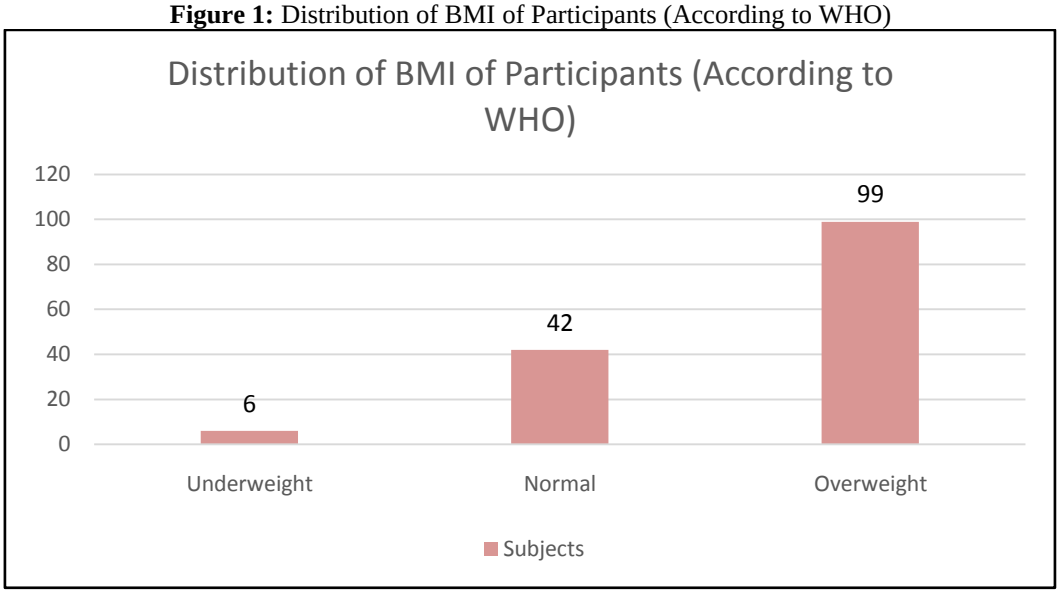

Table 5:- Attributes of hypertension,diabetes and hypercholesterolemia among participants

Variable				Subjects	Percentage
Hypertension	Yes - 117 (79.59%)	Duration	Just diagnosed	24	20.51
			<5 years	27	23.08
			5-10 years	21	17.95
			10-15 years	21	17.95
			15-20 years	15	12.82
			>20 years	9	7.69
		Drug intake	Regular	42	35.9
			irregular	75	64.1
	No - 30 (20.41%)			30	20.41

Variable				Subjects	Percentage
Diabetes (n=147)	Yes - 96(65.30%)	Duration	Just diagnosed	0	0
			< 5 years	3	3.12
			5-10 years	6	6.25
			10-15 years	12	12.5
			15-20 years	45	46.88
			> 20 years	30	31.25
		Drug intake	Regular	36	37.5
			Irregular	60	62.5

	No - 51 (34.70%)		51	34.7

Variable				Subjects	Percentage
Hypercholesterolemia (n=147)	Yes - 108 (73.5%)	Duration	Just diagnosed	15	13.89
			< 5years	42	38.89
			5-10 years	21	19.44
			10-15 years	9	8.33
			15-20 years	15	13.89
			> 20 years	6	5.56
		Drug intake	Regular	30	27.7
			Irregular	78	72.3
	No 39 (26.50%)			39	26.5

Most of the participants were suffering from chronic diseases from last 10 years. Around one third of participants were taking medications irregularly. (Table 5).

IV. Discussion

As we know that that cardiovascular diseases have multifactorial causation, this study was to find out the risk behavior pattern of the CVD patients. In our study majority of the patients were geriatric males from the urban residence. This was similar to a study in Karnataka[7] where 60% of the participants being males with mean age being 62.12±9.89 years.

Socioeconomic status also influences the CVD risk. In our study we found that a greater share of patients were from class I and II of B.G.Prasad classification. Though this preponderance is contrary to other studies[1,5,8,9] which quote lower socioeconomic people have greater risk because of lack of awareness, increased psychological stress with poverty and poor accessibility to the health care. The explanation to our findings lies in the fact that higher economic class are more prone to sedentary work and improper food habits which can increase the CVD risk.

From our study it was inferred that around 63.3% of unemployed/retired shared the maximum proportion of people developing CVD indicating that lack of physical activity increases the risk of CVD.Our study exemplified that sedentary activity carried a greater risk suggested by the figure that 59.2% of participants were sedentary worker.A similar study was conducted in Karnataka which showed this figure to be 64.44%,which was close to our finding. Physical exercise bolsters the body. Exercise has cardio protective effect, decreases adiposity and insulin resistance and enhances the endothelial function.[10]Thus we infer that with 30 minutes of more intense physical activities can decrease the preponderance to CVD.

Abnormal sleep pattern has been identified as a risk factor for CVD.[11-15] In our study maximum share of patients were who slept <8hours a day(59.18%).A similar study conducted by Cappuccio et al gave a RR of 1.48 to the development of coronary diseases.[16] Both decreased sleep owing to stress or anxiety and increased sleep of greater than 9 hours is associated with increased risk of developing the CVDs.[14,15] For a healthy stress free life 7-8 hours of sleep adequacy is imperative.

Addiction to smoking and alcohol, both have deleterious effect on the body. Alcohol addiction causes an increase in blood pressure and deranges the triglyceride levels in the body and thus increases the risk to CVD. Smoking damages the endothelial function and increases the risk of plaque formation thus increasing the propensity of myocardial infarction.[17] In our study, similar to other studies[5], majority of them were chronic addicts supporting the above fact.

Non vegetarian were found to be at greater risk of developing CVD, in particular those who consumed red meat.Red meat contains greater content of cholesterol,saturated fats,trans fats which has deleterious effect on cardiovascular system and increases the risk of CVD. This fact is very much supported by our study.Now coming to the cooking medium,it was seen that patient using Dalda as cooking medium developed the CVD more.This is supported by the fact that 30.64% of patients used Dalda as cooking medium in our study.Dalda contains more of saturated fats and trans fats which are atherogenic and increases the propensity to develop CVD. Most of the patients did not consume fruits on a regular basis.Fruits provide the necessary micronutrients, fibersand other essential non nutrients which helps in proper conditioning of our vascular system. More over this acts as a substitute to saturated fat in the diet.

Around 65% of our patients were diabetics.This is in sync with a similar study in Karnataka[7].Of total diabetics ,around 60%of them were chronic cases (>10years) and more than half of them did not take medicines regularly.Thus improper medication and chronicity increases the risk of CVD.Diabetes in association with hyperglycemia,hyperinsulinemia,dyslipidemia,and hypertension leads to coronary diseases.Increased insulin level contributes to high level of triglycerides and increased sodium retention by renal tubules thus inducing hypertension.Hyperinsulinemia causes endothelial proliferation and finally atherosclerosis. So we see that diabetes has deleterious effect on cardiovascular system.[7,18.19]

Thus we see that there are vivid risk factors associated with CVD. Amongst them majority of them can be averted by bringing merely trifle changes in our living.

The grave threat of CVD can be minimized by our efforts. The aptness of our study will best be judged by our efforts.Let's pledge to counter CVD.

As this is the cross sectional study, thus causal-effect cannot be established with certainty. The study was carried in a tertiary institute thereby risking the external validity.

V. Conclusions

Disease occurred in majority of people belonging to urban areas, who were either retired/unemployed or were leading a sedentary life.Smoking also contributed maximally in occurrence of CVD.It was found that majority of smokers who smoked more than 5 cigarettes/day or who had smoked for more than 10 years had CVD.

Nearly half of the patients were alcohol consumers and disease occurred maximum in chronic alcoholics.Majority of the patients were non vegetarians and consumed increased amount of saturated fats.Owing to this most of them were hypercholesterolemic. Hypertensive and diabetics were more prone to develop CVD.

Thus we see that deranged life style contributes maximally to CVD and prevention lies in our effort towards healthy being.

VI. Recommendations:

After the completion of our study we suggest that bringing life style changes can reduce the CVD.Risk factors can also be reduced by creating awareness among people by health education,promoting physical activities and exercise,making them aware about consequences of alcohol consumption and smoking and educating them of proper dietary habits.Specific advice should be given to the person with identified risk factors and steps should be taken to bring them under preventive care and motivate them to take positive action against all the identified risk factors.

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