

Prevalence of Cardiovascular Disease Risk Factors in Rural and Urban Population

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ABSTRACT

Background: Vigilance towards adaptation of healthy life style as a preventive prototype is barely sufficient.

Aim: To potentiate cognizance regarding cardiovascular disease risk factors.

Method: Data about risk factors of 3000 participants was collected from rural and urban areas. Meanwhile, a prospective data of ACS was collected for a period of two months in both settings.

Results: In urban areas, results show dominance in cases of DM with 90% prevalence, HTN with 86% prevalence and sedentary life style with 90.2% prevalence relative to rural areas. Smoking was common among males with 97% predominance. Trend of BMI was higher in females comprising of 75% cases. All risk factors were linked with data of ACS concluding 290 STEMI cases in urban areas with only one case in rural area. Interim, STEMI is three times in males than in females.

Conclusion: Increasing trend of sedentary life style and smoking along with greater incidence of DM, HTN resulting into cardiovascular events. We should prefer natural healthy life style rather than sedentary life style.

Keywords: Cardiovascular Disease (CVD), Acute Coronary Syndrome (ACS), Relative Percentile (RP), Sedentary Life Style.

INTRODUCTION

Cardiovascular disease is now becoming an alarm and a major public health issue leading to deaths than any other disease⁴. Cardiovascular disease is majorly affecting the world by contributing 60% of total deaths². Global trend of urbanization and gradual transformation into sedentary lifestyle, heading towards progression of cardiovascular disease³. In European countries, cardiovascular events are a major cause of premature deaths^{1,9}. Thus the Cardiovascular events such as myocardial infarction occurs so sudden that medical care and standardized interventions are not accessible at times¹. Knowledge of risk factors (smoking, diet, lack of exercise) which are causing CVD will be definitely a prime step in prevention of cardiovascular event. [3] The data about quantitative analysis of CVD risk factors in rural setting is scarce². Thus, data of rural areas in comparison with urban population will reveal positive results.

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METHOD AND MATERIAL

Cardiovascular disease does not poses a single risk factor, instead it follows a multifactorial pattern¹. Owing to the statistics, we conducted a research by selecting various risk factors participating in occurrence of a cardiovascular event. The occurrence of cardiovascular disease is less common in rural areas¹⁰ so we collected data of risk factors in both rural and urban areas to study their association with ACS. For that purpose, we selected a small village named Nagial present in District Jhelum and Sialkot city for rural and urban setting respectively and collected data of 1500 participants from each setting. The study was explained to the participants and data of risk factors were collected under standardized protocols. Data was collected by participants during their routine OPD visits and their selection was random. Data was divided gender wise into (male, female) and age wise into adults (25-40 yrs.), elder (41-60 yrs.), and old (60+ yrs.) (Table 1).

Risk factors: Risk factors selected were DM, HTN, Smoking, SLS and BMI. All participants were analyzed on these risk factors. Criteria for positive cases is defined in table 2.

Blood glucose: Blood was drawn by finger prick technique. Easy check glucometer of standardized calibration was used. Blood was dropped on the strip and glucose level were measured. Either fasting or random sample were taken and compared with defined criteria. Data was also synchronized by their

previous history of diabetes. FBG > 126mg/dl or RBG > 200mg/dl was labelled as positive case.

Blood pressure: Measurements were taken with a well calibrated mercury Aneroid Sphygmomanometer. Readings were taken after sitting comfortably on chair for >5min with left arm resting on table, at the level of heart. Results were categorized according to grades as defined in table.

Smoking: Tobacco, hukka and shisha were included in this category. Participants who were smoking > 01 year and they used to smoke either >=2 packs per week or at least one tobacco product daily were considered as positive cases.

B.M.I: BMI was calculated, dividing weight in kg by height in m². Anthropometric measurements were taken on periodically calibrated instrument. Weight was measured on weight machine with patient having barefoot. Height was measured in standing position, looking straight in Frankfort plane. Data was sorted into underweight, normal, overweight and obesity. Participants falling in category of overweight and obesity, were considered as positive cases.

Sedentary Life Style: As the living style has been changing with global modernization, so we selected dietary and sleeping habits as an indicators and defined a criteria to assess life styles of both rural and urban population mentioned in table# 2 (Table-2)

ACS: In acute coronary syndrome ST segment elevation Myocardial Infarction (STEMI), non-ST segment elevation Myocardial Infarction (NSTEMI) and Unstable Angina (USA) are included. We collected data for 2 months in a prospective way. In Nagial, patients coming to the basic health unit with chest pain accompanying with associated symptoms were referred to nearest health facility. ECG strips and Trop-T results were collected from them. In Sialkot, two cardiac centers are present. Data of all ACS patients were collected. After two months, data was finally sorted.

RESULTS

Blood Glucose: Total cases of DM are 493/3000. 159 are male and 334 are female. Rural areas have far less cases of DM as compared with urban areas.

Statistics shows 10 times greater prevalence in urban areas. Females have greater amount of cases, almost double than males. % of DM cases is largest in elder age group.

Blood Pressure: Total cases are 717/3000. 294 are male and 423 are female. Grade-2 HTN is the most common, with grade 1 and 3 succeeding respectively. HTN is dominant in elder age group. While comparing urban and rural areas, Sialkot has six times more cases than Nagial. Females have 1.5 times greater prevalence than males.

Smoking: Total cases are 498/3000 with 486 male and only 12 female. In rural areas, some participants used to smoke hukka while in urban, some used to smoke shisha but overall majority were smoking Tobacco. Smoking is common in both rural and urban settings. The prevalence among female is almost negligible in comparison with males.

Sedentary Life Style: Total cases are 663/3000. In urban areas, life style has been acclimatized towards easiness while in rural setting people still used to live arduous life. [] They are following the principle of “Early to bed and early to rise”. Results shows 9 times greater prevalence in urban areas as compared to rural areas. The greatest % lies among adults, as they are more prone towards luxury.

B.M.I: Total 1359/3000 cases had BMI above normal. The trend in both rural and urban settings is almost in same range. Prevalence in females is 3 times greater than in males. Least number of cases are among males of rural areas.

ACS: Data was collected for period of two months regarding ACS in both Nagial and Sialkot. As total population of both areas is different so to equalize the results we divided total cases with total population and termed it as relative percentile. Total 291 cases of STEMI were reported, one patient from Nagial and 290 from Sialkot. After comparing the relative percentile, STEMI cases in Sialkot are three times greater than Nagial.

Cases of NSTEMI and USA in Sialkot are 6x and 8x respectively. Conclusively, prevalence of ACS in urban areas is greater than in rural areas. Statistics also shows that STEMI cases among males are 3x in females.

Table 1

Sample	Magial (rural)			Sialkot (urban)		
	Catchment area (18,000)			Catchment area (10,00,000)		
Age	25-40(Adults)	41-60(Elder)	60+(Old)	25-40(Adults)	41-60(Elder)	60+(Old)
Men	215	165	90	203	217	112
Women	375	335	320	262	394	312
Total	1500			1500		

Table 2

DM		
Fasting Blood Glucose(FBG)	>126mg/dl	
Random Blood Glucose(RBG)	>200mg/dl	
HTN		
Grade-1	(>150/90 mmHg)	
Grade-2	(>160/100 mmHg)	
Grade-3	(>180/120 mmHg)	
Smoking		
Cigarette /Hukka /Shisha	> 01 year, >= 2 packs/week	
Sedentary Life Style*		
Fast Food(Pizza, Burger)	>= 2 meals/week	
Beverages	>=7 glasses/ week	
Sleeping Habits	Late sleep > 11:30 pm	Late rise > 8:00 am
*(>=2 of above indicators is considered as positive case)		
BMI		
Underweight	(<18.5) kg/m ²	
Normal	(18.5-24.5) kg/m ²	
Over weight	(24.5-29.5) kg/m ²	
Obesity	(>30) kg/m ²	
CHD		
STEMI	ST elevation >= 2mm in chest leads	ST elevation >= 1mm in limb leads
NSTEMI (Trop-T +ve)	ST elevation < 2mm in chest leads T- wave inversion	ST elevation < 1mm in limb leads ST- segment depression
USA (Trop-T -ve)	ST elevation < 2mm in chest leads T- wave inversion	ST elevation < 1mm in limb leads ST- segment depression

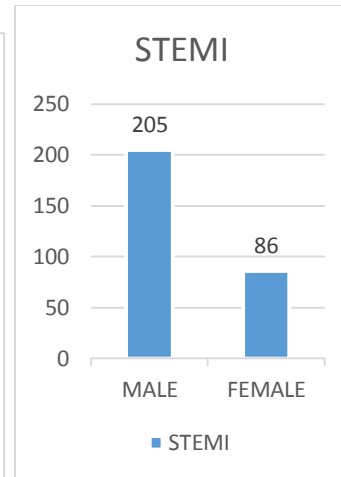
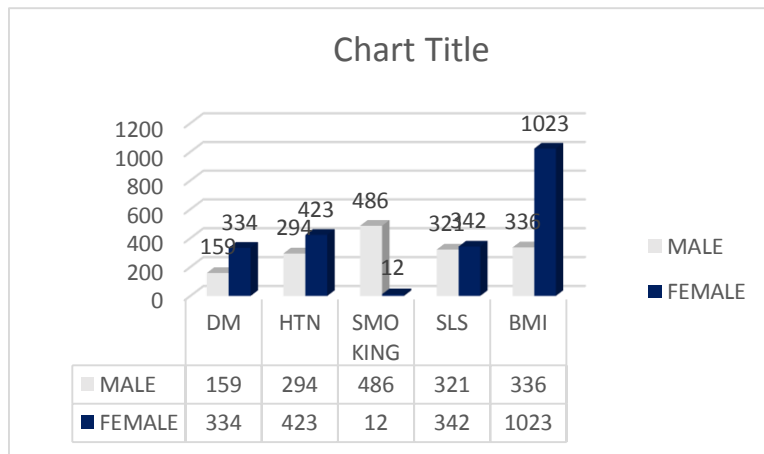
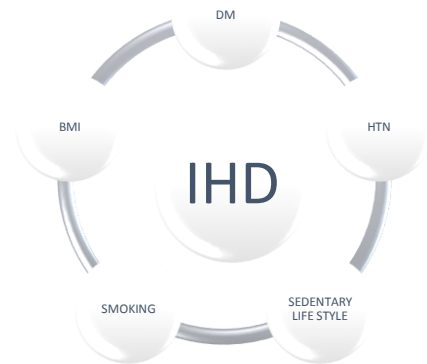
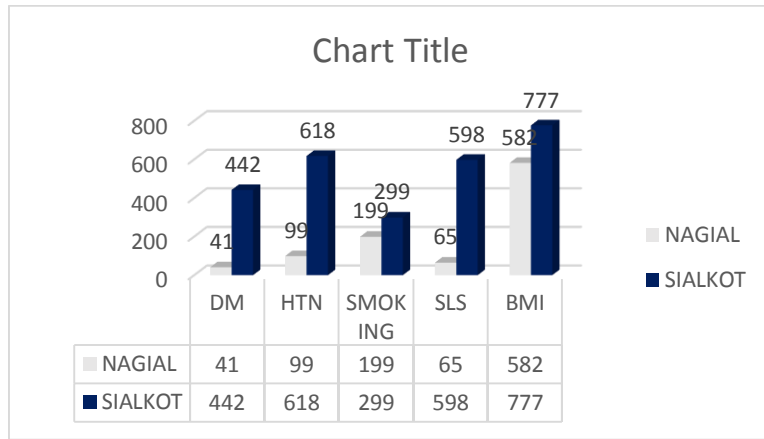
Table 3: Data of 3000 participants were studied regarding risk factors and data of 5307 cases were sorted regarding ACS.

Sample	Nagial (rural)						Sialkot (urban)					
	Male			Female			Male			Female		
	25-40 (adults)	41-60 (elder)	60+ (old)	25-40 (adults)	41-60 (elder)	60+ (old)	25-40 (adults)	41-60 (elder)	60+ (old)	25-40 (adults)	41-60 (elder)	60+ (old)
DM												
Cases	Nil	07	03	02	35	04	28	72	49	34	127	132
Total	10			41			149			293		
HTN												
Grade-1	02	05	01	13	08	03	37	49	11	33	45	29
Grade2	00	03	04	06	30	05	12	57	60	28	93	54
Grade 3	00	02	02	Nil	08	07	05	21	23	08	20	33
Total	19						343					
Smoking												
Cases	20	76	101	Nil	Nil	02	77	103	109	04	02	04
Total	197			02			289			10		
Sedentary Life Style												
Cases	41	07	Nil	10	07	Nil	173	87	13	187	101	37
Total	48			17			273			325		
BMI												
Under Weight	30 14.0%	13 7.9%	07 7.8%	37 9.9%	12 3.6%	13 4.06%	28 13.8%	13 6.0%	06 5.4%	30 11.45%	11 2.8%	15 4.8%
Normal	132 61.4%	112 67.9%	61 67.8%	170 45.3%	173 51.6%	158 49.4%	113 55.7%	97 44.7%	57 50.9%	99 37.79%	118 29.9%	139 44.6%
Over weight	41 19.1%	31 18.8%	15 16.7%	97 25.9%	89 26.6%	82 25.6%	52 25.6%	86 39.6%	36 32.1%	81 30.9%	157 39.8%	84 26.9%
Obesity	12 5.6%	09 5.5%	07 7.8%	71 18.9%	61 18.2%	67 20.9%	10 4.9%	21 9.7%	13 11.6%	52 19.8%	108 27.4%	74 23.7%
Total	470			1030			532			968		
Over weight +Obesity	115(24.5%)			467(45.3%)			221(41.5%)			556(57.4%)		

Table 4:

		NAGIAL(rural)		SIALKOT(urban)	
		Catchment area (18,000)		Catchment area (10,000,00)	
STEMI	Cases	01 (M)	NIL (F)	204 (M)	86 (F)
	Total	01		290	
	RP	0.01		0.03	
	RR	3x			
NSTEMI	Cases	02 (M)	01 (F)	597 (M)	407 (F)
	Total	03		1004	
	RP	0.017		0.1	
	RR	6x			
USA	Cases	04 (M)	05 (F)	1987 (M)	2013 (F)
	Total	09		4000	
	RP	0.05		0.4	
	RR	8x			

(RP) = Relative%= Total Amount/ Catchment Area*100(RR) = Relative Risk= RP Sialkot/ RP Nagia



DISCUSSION

Conducted study inclusively focuses over two main aspects. One, the prevalence of ACS and its risk factors in rural and urban settings and the other is to study its % between male and female.

Analyzing the results, diabetes, hypertension and sedentary life style are predominantly prevalent among urban areas. In urban settings, life style of

people is changing rapidly and they are getting more inclined towards sumptuous standards. Physical activity has been reduced, people are living in stress, consumption of beverages are following an increasing trend and their eating diet contains fatty bulk instead of fiber⁶. The sleeping habits have been changed leading to increase incidence of depression among people¹¹. Results show that sedentary life style in urban areas is 9x more than rural areas,

especially advancing trend in young adults. Increased luxurious life style is also contributing in progression of DM and HTN collectively leading towards ACS¹².

While comparing data of males and females, males have relatively less % of DM and HTN. BMI of females in both rural and urban area is 2-3 times greater than males. Smoking is predominantly prevalent in the males. Females have a very minute number of cases.

Linking all the factors with ACS, cardiovascular events are much more common in urban areas^{17,18}. A striking fact while analyzing data, STEMI among males is 3x common than females, in spite of results that DM, HTN, BMI are prevalent in females. Heavy smoking among males prevails all other factors in causing STEMI. European guidelines have declared high risk patient to:

1. Having multiple risk factors.
2. Markedly raised single risk factor.
3. DM-1 or DM-2 with complication.

National Health Survey conducted a research in Pakistan showing the prevalence of DM and HTN in society and modification of their dietary habits inclining towards consumption of saturated fats. This study showed 33% prevalence of DM and 25% prevalence of HTN in elderly and old age people. Increased smoking trend in men especially in young adults getting up to 41%⁴. The results are in accordance to current study, showing their increasing trend in elder and old age. In one study, data links association of risk factors leading to acute myocardial infarction in urban setting [3] while the other have studied the risk factors in lower and middle class [5]. SCORE project has emphasized on total risk factors rather than focusing on single factor. [7] Our study has made comparison of maximum risk factors among rural and urban areas along with its association with ACS and simultaneously equate data between male and female.

The objectives of our conducted study is to spread awareness about risk factors contributing towards progression of ACS. If we adopt healthy life style, we can not only prevent cardiovascular attack, but studies shows the regression of coronary heart disease⁸.

RECOMMENDATIONS

1. Replace the fast food with high fiber content¹³.
2. Reduce the soft drinks and beverages¹⁴.
3. Stop the smoking¹⁵.
4. Walk at least 20-30 minutes daily¹⁶.

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