Novelty Journals

ISSN 2394-966X

International Journal of Novel Research in Life Sciences
Vol. 2, Issue 4, pp: (14-20), Month: July - August 2015, Available at: www.noveltyjournals.com

Effect of Alcohol Consumption on the changes in the blood pressure level with in one schedule caste community (Sweeper) of the District 24 Pgs North, West Bengal, India

[1]Piyasi Bhattacharjee, [2]Prof. Chanchal Kumar Manna

[1, 2] Endocrinology laboratory, University of Kalyani, Kalyani Nadia, India

Abstract: **The aim of this cross-sectional, community based survey was to investigate the prevalence of hypertension, Isolated Systolic Hypertension(ISH), Isolated Diastolic Hypertension (IDH) and Pre-hypertension according to socio demographic features and alcohol consumption among one of the members of scheduled caste sweeper community of the District 24 PGS North, West Bengal, India, in individuals aged approximately 19 to 69 years.**

Methods: A door to door survey work was conducted. Detailed information was collected from participants who were interviewed using a pre-tested structured questionnaires. Standard instruments were used to obtain data on weight, height and blood pressure. Data were analysed using standard statistical method.

Results: The prevalence of hypertension (Systolic Diastolic Hypertension) according to different risk factors in the studied population (N=612) is presented in Table No.1. The overall crude prevalence of hypertension (BP>=140/90 mmHg, based VII on the report of American JNC, 2003 and WHO criteria for 18 years old or above) is 16.49 % the pre-hypertensive (BP=120-139/80-89 mm Hg) condition is about 36.77% isolated systolic hypertensive (BP>=140/<90mm Hg) and Isolated Diastolic Hypertensive (BP<140/>=90 mm hg) rate are 17.34 and 4.38 respectively.38.35% of the total studied population is known to have normotensive (Table 1 and Fig 1). Prevalence of hypertension is higher among the males compared to the females. Isolated systolic hypertension, Isolated Diastolic hypertension and Pre-hypertension levels are also higher in males than females.(ISH 15.62%, 13.36%, IDH 4.98% and 2.78%, Pre H 35.62%, 32.43%) Table-1, Fig-1.

Prevalence of hypertension is increased significantly with increasing body mass index (BMI)58.96%, 67.54% and 71.53% respectively hypertensive individuals are found in three BMI groups such as BMI<19.9 kg/$m^{2,}$ BMI=20-24.9 kg/m^2, and BMI>=25 kg/m^2.Systolic diastolic hypertension (SDH) tendency is increased with increasing BMI 24.16%, 24.56% and 31.65% (Table-1, Fig.2). Correlation study between alcohol consumption and blood pressure revealed that the blood pressure (SBP and DBP) is directly correlated with the alcohol consumption and it is significant at 0.05%level.

Conclusion: The results of this investigation clearly indicate that there was a significant role of alcohol in the development of hypertension.

Keywords: **Hypertension, scheduled caste sweeper community, cardiovascular diseases, systolic and diastolic blood pressure, body mass index.**

I. BACKGROUND

Hypertension is an emerging public health problem due to its high prevalence and association with cardiovascular and overall morbidity and mortality. A recent estimate indicates that more than 25% of the world's adult population i.e. one billion had hypertension in 2000 which is likely to increase to almost 30% by2025.(1) This higher prevalence of hypertension contributes to the current pandemic of cardiovascular diseases which accounts for almost 30% of all deaths globally(1).

This analysis also reports that hypertension is greater population burden in economically developing rather than developed countries. In India, around one-fifth of its population had hypertension in 2000 which is likely to increase by another 2-3% in 2025. In the INTERHEART and INTERSTROKE study, hypertension accounts for 17.9% and 34.6% population attributable risk for coronary artery diseases and stroke respectively.(2-3).

Evidence suggests that an increase by 10 mmHg above 120 mmHg is associated with 10% greater risk of cardiovascular diseases, although the risk increases after 110 mmHg (6). In a prospective study it is noted that majority of incident cardiovascular disease events occur in persons who were prehypertensive or mildly hypertensive on diagnosis (7). So, prevalence of pre-hypertension is equally important to know as that of hypertension. Distribution of blood pressure of the entire population gives the cues for appropriate intervention strategies and more so among law enforcers.

Aims of the study:

More than half the world's undernourished population lives in India (8). Although rapid development has occurred in several areas in India during the last two decades, improvements in the nutritional status of the Indian population have not been impressive (9).

The relation between regular alcohol consumption and blood pressure has been described in several epidemiological surveys (10). Consumption of a single alcoholic drink may cause an acute rise in blood pressure that resolves within 2 hours.56 Clinical studies with small sample sizes of subjects have suggested that alcohol consumption over several days may cause a more sustained rise in blood pressure.78 In alcoholics, hypertension is common but settles after withdrawal from alcohol.(11) This raises the possibility that alcohol may only exert a short-term effect on blood pressure. The hypothesis that the effect of alcohol on blood pressure is mainly due to alcohol consumed in the few days preceding measurement of blood pressure was therefore examined in this study.

In this context the present study was conducted to estimate the prevalence of hypertension, Pre-hypertension, normotension, to identify the associated factors with hypertension and high BP (hypertension and pre-hypertension together) and to note the awareness, treatment and control of hypertension among sweeper personnel in 24 Parganas North, West Bengal.

II. SUBJECTS AND METHODS

Study population:

Study participants were Mathor or sweeper adult's community of the District 24 PGS North, West Bengal. Experiment was performed between April 2011 to December 2011.They were excluded to rule out the possible influence of a diagnosis of hypertension and heart disease on the pattern of alcohol consumption. A total of 610 subjects remained eligible for analysis. The study group consisted of 298 adult men and 312 adult women aged between 20 and 69 years.

Methods:

Alcohol consumption was ascertained by means of self-administered questionnaires. Subjects were asked how often they usually drank alcohol on a weekly basis and how many standard drinks they usually consumed on a daily basis. A standard drink was considered any drink that contains about 10 g of pure alcohol. Subjects were categorized according to the amount of standard drinks consumed weekly: none per day, 1 to 50gm per day, 50 to100 gm per day, and more than 100 gm per day. A few studies have shown that the effect of alcohol consumption on the risk of hypertension starts with consumption of more than threshold amount.(2,7). A prospective study of young women reported that light drinkers who consumed more than 0.25 drinks per day showed a decrease in the risk of hypertension (2). In this study, therefore, the consumption in the 1 to 3 drinks per day category was included to see whether there is a threshold level for the association between alcohol consumption and the risk of hypertension. Self-administered questionnaires were also used to examine the status of cigarette and bidi smoking. Individuals were categorized as non smoker, ex-smoker, and current smokers. Blood pressure was measured in sitting posture using a standard mercury sphygmomanometer. Subjects were categorized as having hypertension if they had systolic blood pressure $\geq$ 140 mm Hg or diastolic blood pressure $\geq$ 90 mm Hg. Body weight with light clothing and height without shoes were measured. Body mass index (BMI) was calculated as the weight in kilograms divided by the square of height in meters.

Statistical analysis:

Various statistical methods were used for the determination of the dependence of one variable to other and correlation study for the degree of association between two variables were used for the analysis of the data by using SPSS21 version and Microsoft Excel software.

III. RESULT

The prevalence of hypertension (Systolic Diastolic Hypertension) according to different risk factors in the study population (N=612) is presented in Table No.1. The overall crude prevalence of hypertension (BP>=140/90 mmHg, based VII report of American JNC, 2003 and WHO criteria for 18 years old or above) is 16.49 %, the pre-hypertensive (BP=120-139/80-89mmHg) condition is about 36.77% isolated systolic hypertensive (BP>=140/<90mm hg) and Isolated Diastolic Hypertensive (BP<140/>=90 mm Hg) rate are 17.34% and 4.38% respectively. 38.35% of the total study population is known to be normotensive (Table 1 and Fig 1). Prevalence of Hypertension is higher among the males compared to the females. Isolated systolic Hypertension, Isolated diastolic hypertension and Pre-Hypertension levels are also higher in males than females. (ISH 15.62%, 13.36%, IDH 4.98% and 2.78%, Pre H 35.62%, 32.43%) Table-1, Fig-1.

Prevalence of hypertension is increased significantly with increasing body mass index (BMI)i.e.,58.96%, 67.54% and 71.53% and hypertensive individuals are found in three BMI groups such as BMI<19.9 kg/$m^{2,}$ BMI=20-24.9 kg/m^2, and BMI>=25 kg/m^2.Systolic diastolic hypertension (SDH) tendency is increased with increasing BMI 24.16%, 24.56% and 31.65% (Table-1, Fig.2).

Prevalence of hypertension is increased significantly with increasing alcohol consumption.

Prevalence of hypertension is higher among the males compared to the females. Isolated systolic Hypertension, Isolated Diastolic Hypertension and Pre-Hypertension levels are also higher in males than females presented in Fig.3.

Correlation study between age and blood pressure revealed that the blood pressure (SBP and DBP) is directly correlated with the age and it is significant at 0.01%level.

Correlation study between body mass index (BMI) and blood pressure revealed that the blood pressure (SBP and DBP) is directly correlated with the BMI and it is significant at 0.01%level.

Correlation study between alcohol consumption and blood pressure revealed that the blood pressure (SBP and DBP) is directly correlated with the alcohol consumption and it is significant at 0.05%level.

IV. DISCUSSION

The present study provides further supportive evidence for the suggestion that alcohol has a "slow pressor" effect which is quite reversible (12). The mechanism mediating this effect, however, remains unclear (13). If alcohol does have such reversible effects on blood pressure, then it is possible that it does not cause sustained hypertension. The important question is whether the alcohol-induced rise in blood pressure confers the same cardiovascular risks as those due to other forms of hypertension. There is now substantial evidence linking high alcohol consumption with stroke (20,21) and to a lesser extent with coronary heart disease,(14,15) and it is possible that alcohol-induced hypertension partially mediates these associations. Friedman et al (16,17) found that admissions and death from cardiovascular complications, apart from coronary heart disease, were similar in hypertensive patients with high alcohol consumption compared with those with low alcohol consumption.

It therefore appears that alcohol-induced hypertension leads to an increase in cardiovascular disease, but the evidence is not conclusive (18, 19). The knowledge that alcohol exerts a reversible effect on blood pressure may be useful in the management of hypertensive patients. Patients may have consumed excessive quantities of alcohol in the few days preceding clinic attendance, and it would be worthwhile advising them to reduce alcohol consumption while withholding institution of or changes in antihypertensive therapy and then reviewing them within a few days. Preliminary results suggest that such advice is an effective form of treatment for these patients (22).

Hypertension is directly related with BMI. It shows that with the increase in the BMI the trend of hypertension rises in both females and males. Hypertension is strongly related with age and gender. In males the prevalence of hypertension in general is high in all age groups; however there is a significant rise in the number of hypertensive females in the age

group below 30 years in the overweight category and a slight rise in hypertensive trend in females above the age of 59 years in both overweight and obese categories as compared to males. In the normal BMI category, relatively large percentage of males shows sign of hypertension, whereas in the overweight category, hypertension among females is high. The current study did not include weight history and the effect of weight change on hypertension. Therefore, we cannot conclude from our data how the optimal weight should be achieved. Hypertension is more common in overweight and obese class in both males and females. In future effect of diet, socio-economic and psychological status is addressed to find the cause of age, gender, BMI and hypertension. Our results indicate that the relationship between alcohol consumption and blood pressure is apparent across several types of alcoholic beverages. The variation in blood pressure associations by predominant type of alcoholic beverage may have been due to the effect of chance, but one cannot rule out a variation in the effect of the beverages in different gender strata. Alternatively, the differences in risk may have merely reflected the effect of a more general behaviour associated with the kind of preference in alcohol consumption.

The mechanism of alcohol-induced hypertension is unclear (21, 23). Effects on the renin-angiotensin-aldosterone axis, adrenergic nervous system discharge, heart rate variability, ionic fluxes, cortisol secretion, or insulin sensitivity have been proposed as underlying mechanisms of action. The large number of such hypotheses suggests that none is sufficient to explain the relationship.

Table: 1

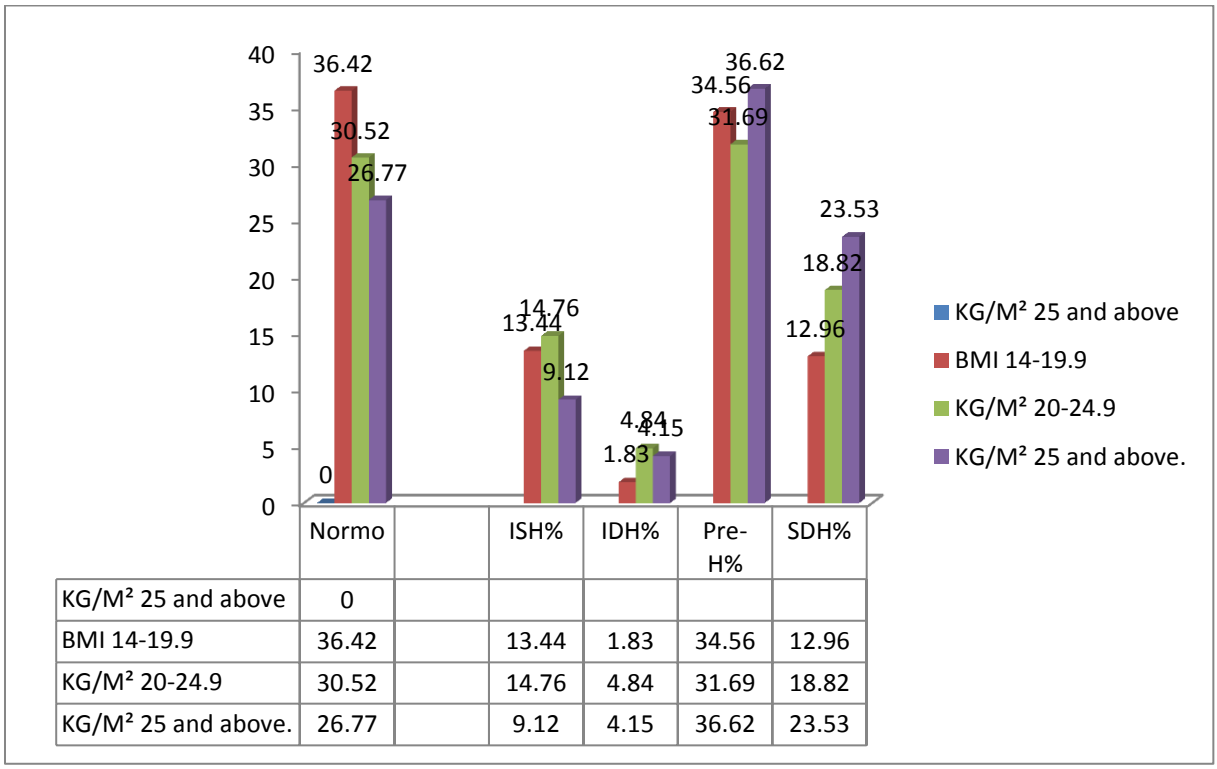
Prevalence Of Non-Hypertensive, ISH, IDH, Pre-H And Sdh According To Socio-Demographic Features Of The Sweeper Community (Scheduled Caste) People Of The District 24 Parganas North, West Bengal, India.

Socio-demographic features		Number	normotensive (%)	prevalence of hypertension(%)			
				ISH	IDH	Pre-H	SDH
Total population surveyed		612	38.35	17.34	4.38	36.77	16.49
Age group	20-29	180	42.27	11.45	6.46	36.68	5.89
	30-39	165	37.54	8.91	3.21	37.54	14.68
	40-49	71	21.64	23.56	7.17	23.4	23.34
	50-59	81	21.34	24.64	1.49	42.11	22.38
	60-69	113	21.22	29.38	2.08	27.69	28.72
Sex	Male	298	22.54	15.62	4.98	35.62	21.58
	Female	312	39.43	13.3	2.78	32.43	14.01
Marital status	Married	390	33.29	13.94	4.01	32.12	16.75
	Unmarried	220	38.57	12.53	3.78	34.06	11.82
Occupation	House hold work	31	20.45	17.97	7.34	27.49	29.08
	Labour	11	33.55	15.69	2.09	29.85	17.68
	Others	568	47.21	8.32	2.62	28.76	11.65
Education	illitarate	587	36.31	11.45	2.95	31.58	16.18
	school level	23	21.52	15.68	1.02	32.48	31.04
Drug	Normal	288	52.88	3.56	2.74	34.56	4.53
Addiction	Alcohol	322	24.64	23.78	4.36	30.54	21.98
BMI	14-19.9	245	36.42	13.44	1.83	34.56	12.96
KG/M^2	20-24.9	295	30.52	14.76	4.84	31.69	18.82
	25 and above	80	26.77	9.12	4.15	36.62	23.53
WHR	0.8-0.88	365	39.33	11.89	3.56	33.34	14.76
	0.9-0.99	245	31.61	16.45	3.79	31.37	17.94
	3.5-6.5	291	35.12	18.33	2.86	32.52	15.74
Salt intake	6.5-10.5	72	41.29	12.45	2.23	23.54	21.65
	above	247	32.74	12.34	6.26	30.87	18.06

Novelty Journals

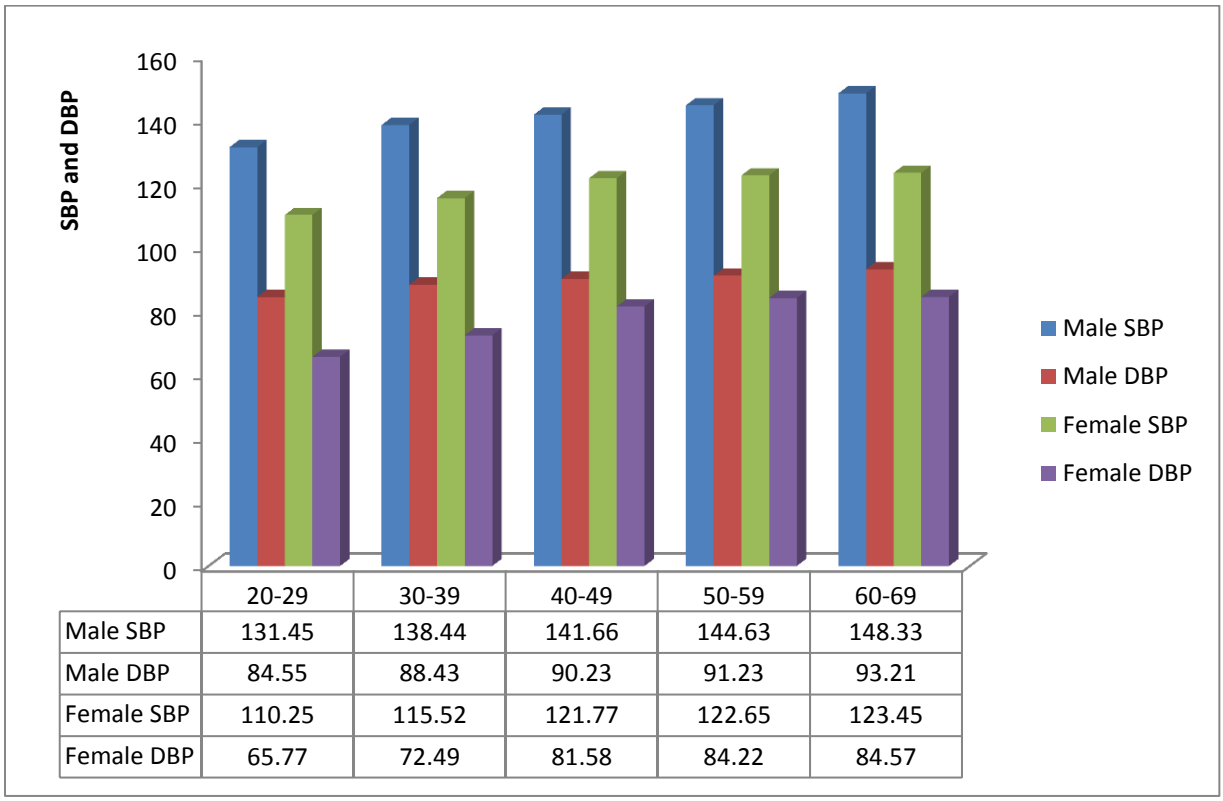
ISSN 2394-966X

International Journal of Novel Research in Life Sciences
Vol. 2, Issue 4, pp: (14-20), Month: July - August 2015, Available at: www.noveltyjournals.com



	Normo		ISH%	IDH%	Pre-H%	SDH%
KG/M² 25 and above	0					
BMI 14-19.9	36.42		13.44	1.83	34.56	12.96
KG/M² 20-24.9	30.52		14.76	4.84	31.69	18.82
KG/M² 25 and above.	26.77		9.12	4.15	36.62	23.53

Figure.1: Showing prevalence of normotensive, Pre-hypertensive, Isolated Systolic Hypertensive, Isolated diastolic Hypertensive and systolic diastolic Hypertensive individuals in per cent in different body mass index(BMI) groups surveyed within the Sweeper(Methar) People of the District 24 PGS North , West Bengal



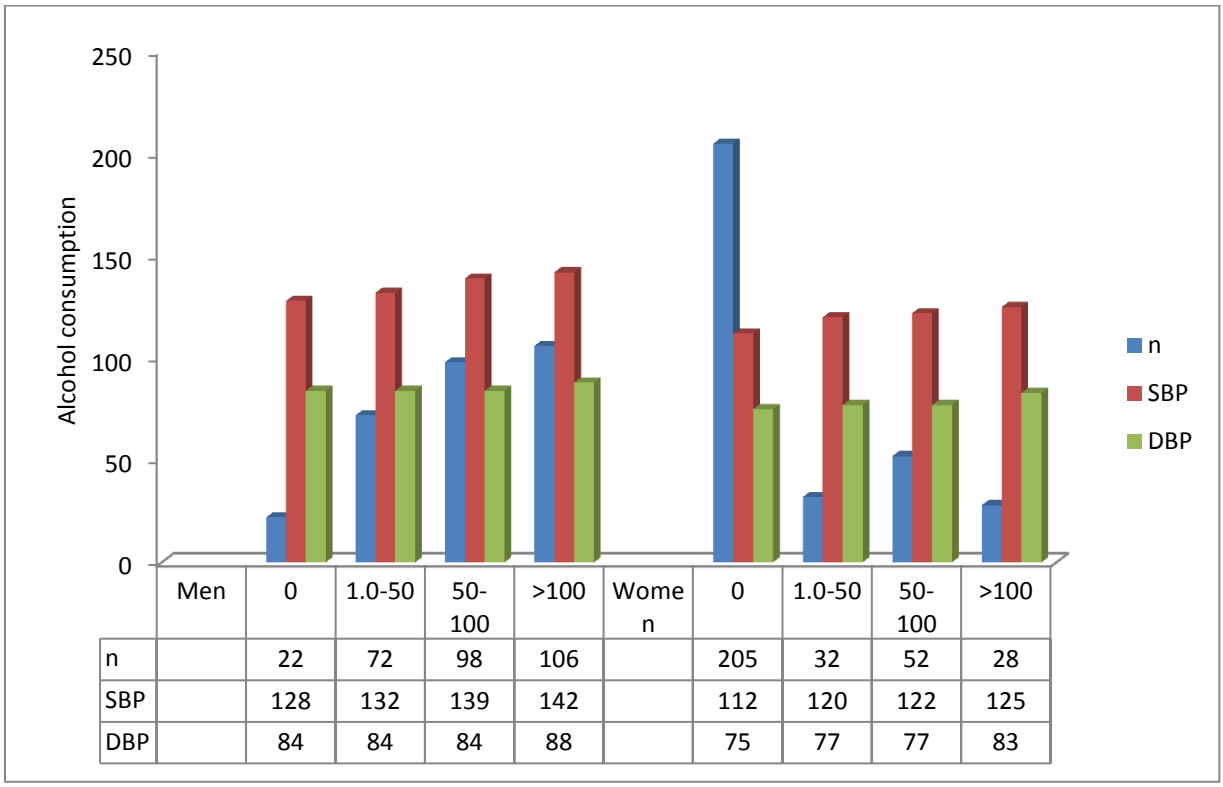
	20-29	30-39	40-49	50-59	60-69
Male SBP	131.45	138.44	141.66	144.63	148.33
Male DBP	84.55	88.43	90.23	91.23	93.21
Female SBP	110.25	115.52	121.77	122.65	123.45
Female DBP	65.77	72.49	81.58	84.22	84.57

Figure.2: Showing the changes of blood pressure (SBP and DBP)in different age groups surveyed within the Sweeper(Mathor)People of the District 24 PGS North , West Bengal

Novelty Journals

ISSN 2394-966X

International Journal of Novel Research in Life Sciences
Vol. 2, Issue 4, pp: (14-20), Month: July - August 2015, Available at: www.noveltyjournals.com



	Men	0	1.0-50	50-100	>100	Women	0	1.0-50	50-100	>100
n		22	72	98	106		205	32	52	28
SBP		128	132	139	142		112	120	122	125
DBP		84	84	84	88		75	77	77	83

Figure.3: Effect of Alcohol Intake on Systolic and Diastolic Blood Pressures in Men and Women

ACKNOWLEDGEMENTS

The authors are grateful to the people of the District 24 PGS North, West Bengal, India , who provided whole-hearted support for the collection of the data in relation to hypertension and during the field study.

REFERENCE

[1] Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. Lancet 2005;365:217-23.

[2] Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet 2004;364:937–52.

[3] O'Donnell MJ, Xavier D, Liu L, Zhang H, Chin SL, Rao-Melacini P, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. Lancet 2010;376:112–23.

[4] Mittleman MA, Maclure M, Tofler GH, Sherwood JB, Goldberg RJ, Muller JE. Triggering acute myocardial infarction by heavy physical exertion: Protection against triggering by regular exertion. N Engl J Med 1993;329:1677-83.

[5] Kales SN, Tsismenakis AJ, Zhang C, Soteriades ES. Blood pressure in firefighters, police officers and other emergency responders. Am J Hypertens 2009;22:11-20.

[6] Stamler J, Stamler R, Neaton JD. Blood pressure, systolic and diastolic and cardiovascular risk: US population data. Arch Intern Med 1993;153:598-615.

[7] Krishnaswami K. Country profile: India. Nutritional disorders— old and changing. Lancet 2000;351:1268–9.

[8] Griffiths PL, Bentley ME. The nutrition transition is underway in India. J Nutr 2001;131:2692–700.

[9] Topal YS, Samal PK. Causes for variation in social and economic conditions among tribes of Indian Central Himalaya: A comparative study. Man India 2001;81:87-91.

[10] Strogatz DS, James SA, Haines PS, Elmer PJ, Gerber AM, Browning SR, Ammerman AS, Keenan NL. Alcohol consumption and blood pressure in black adults: the Pitt Count Study. Am J Epidemiol. 1991;133:442– 450.

[11] Klatsky AL, Friedman GD, Armstrong MA. The relationships between alcoholic beverages use and other traits to blood pressure: a new Kaiser- Permanent Study. Circulation. 1986;73:628–636.

[12] Lang T, Degoulet P, Aime F, Devries C, Jacquinet-Salord M-C, Fouriaud C. Relationship between alcohol consumption and hypertension prevalence and control in a French population. J Chronic Dis. 1987;40: 713–720.

[13] Trevisan M, Krogh V, Farinaro E, Panico S, Mancini M. Alcohol consumption, drinking pattern and blood pressure: analysis of data from the Italian National Research Council Study. Int J Epidemiol. 1987;16: 520–527.

[14] Keil U, Chambless L, Filipiak B, Härtel U. Alcohol and blood pressure and its interaction with smoking and other behavioural variables: results from the MONICA Augsburg Survey 1984–1985. J Hypertens. 1991;9: 491–498.

[15] MacMahon SW, Blacket RB, Macdonald GJ, Hall W. Obesity, alcohol consumption and blood pressure in Australian men and women: the National Heart Foundation of Australia Risk Factor Prevalence Study. J Hypertens. 1984;2:85–91

[16] Saunders JB.Alcohol: An important cause of hypertension. Br MedJ 1987^94:1045-1046

[17] Maheswaran R, Beevers DG. Alcohol and hypertension — Epidemiological aspects, haemodynamic effects and possible mechanisms, in Bursztyn P (ed): Nutrition and Blood Pressure. London, John Iibbey and Co, 1987, pp 63-84

[18] Donahue RP, Abbott RD, Reed DM, Yano K. Alcohol and haemorrhagjc stroke: The Honolulu heart program. JAMA 1986;225:2311-2314

[19] Gill JS, Zezulka AV, Shipley MJ, Gill SK, Beevers DG. Stroke and alcohol consumption. N Engl J Med 1986;315:1041-1046

[20] Marmot MG: Alcohol and coronary heart disease. Int J Epidemiol 1984;13:160-167

[21] Dyer AR, Stamler J, Paul O, Berkson DM, Shekelle RB, Lepper MH, McKean H, Lindberg HA, Garside D, Tokich T. Alcohol, cardiovascular risk factors and mortality: The Chicago experience. Circulation 1981;64(suppl III):III-20-HI-27

[22] Friedman GD, Klatsky AL, Siegelaub AB. Alcohol intake and hypertension. Ann Intern Med 1983;98(Part 2):846-849

[23] Maheswaran R, Beevers M, Beevers DG. Evaluation of alcohol advice in hypertensive patients (abstract). / Hypertens 1988;6:946.