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A CROSS SECTIONAL STUDY ON HYPERTENSION AND ALCOHOL CONSUMPTION AMONG RURAL ADULT POPULATION OF KAMRUP DISTRICT, ASSAM.

Community Medicine

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ABSTRACT

Introduction: Hypertension (HTN) is one of the common non- communicable disease which has become an important public health problem worldwide. Hypertension being an iceberg disease, majority of the person remain unaware, undiagnosed or untreated. There is increasing evidence that alcohol initiates central as well as peripheral reactions which in a synergistic manner have a hypertensive action. In addition, alcohol induces an increased sympathetic outflow, most probably linked to secretion of corticotrophin releasing hormone. Some investigators have suggested that the association between alcohol and hypertension is related to the temporal sequence of alcohol use and blood pressure measurement. According to the NFHS 4 data the prevalence of hypertension among females and males in Assam are Slightly above normal (140-159/90-99) :11.7%; Moderate hypertensive (160-179/100-109): 3%; very high (>= 180/>= 110) : 1.3% & Slightly normal :15%, moderate :3.1%; Very high : 1.5% respectively. The prevalence of alcohol consumption among males and females in the state of Assam according to NFHS 4 data are 35.6% and 6.9% respectively.

The present study was conducted with the following objectives:

1) To assess the prevalence of hypertension and alcohol consumption among the rural adult population of Kamrup district, Assam.

2) To assess alcohol consumption as a risk factor for hypertension

Methodology: A community based cross sectional study was conducted in the rural area of Kamrup district, Assam for a Period of one year (August 2015- July 2016). Adults aged 30 years and above is included in the study after taking informed consent, who have no acute illness and who were not pregnant. Subjects were interviewed using pre designed pre tested proforma. A total of 870 respondents were interviewed from 12 randomly selected villages. Ethical clearance obtained from Institutional Ethics Committee. Data presented in the form of table, bar diagram & pie diagram. Data analysis done by using INSTAT GRAPH PAD, and a p value of < 0.05 is taken as significant. Results: The study shows, majority, 252 (28.96%) respondents were normotensive, followed by 240 (27.58%) were pre hypertensives, and least number of respondents i.e 180 (20.68%) were hypertensive with stage 2. Among the respondents life time alcohol abstainers were 26.9% and 73.1% were alcohol users. . The prevalence of hypertension was highest, 59.09%% among the current drinkers, followed by 47.5% among the former drinkers and least,12.82% among the life time abstainers. The association of alcohol consumption and hypertension is statistically significant. Among the current alcohol consumers, 37.12% of the respondents drinks daily. The prevalence of hypertension was highest, 71.42% among those who consume daily, followed by 67.96% among those consuming 1-5 days/ week. The association of hypertension and frequency of alcohol consumption is statistically significant.

KEYWORDS

INTRODUCTION:

Non communicable diseases are the major issue to be dealt with in the present day era.. Non communicable diseases are the diseases of long duration and slow progression . The prevalence of non communicable disease is showing upward trend globally. As the life expectancy is increasing in most of the countries, and a greater number of people are living in old ages, and are at greater risk of non communicable diseases. The change in the life style and behavioral pattern are other contributing factor to the emergence of increasing burden of non communicable diseases. Non communicable diseases affects both developed and developing countries. Non communicable disease contribute to 28 million deaths in the low and middle income countries. (WHO NCD Fact sheet 2015). The major non communicable diseases are hypertension, diabetes, cardiovascular diseases, stroke, cancer.

Hypertension (HTN) is one of the common non- communicable disease which has become an important public health problem worldwide. Hypertension being an iceberg disease, majority of the person remain unaware, undiagnosed or untreated. From an epidemiological perspective, there is no obvious level of blood pressure that defines hypertension. In adults, there is a continuous, incremental risk of cardiovascular disease, stroke and renal disease across levels of both systolic and diastolic blood pressure. Clinically hypertension might be defined as that blood pressure at which the institution of therapy reduces blood pressure related morbidity and mortality. **[.1]**

For the majority of patients with high blood pressure, the cause is unknown. This is classified as primary or essential HTN. A small portion of patients have a specific cause of their high blood pressure, which is classified as secondary HTN.**[2]**Over 90% of patients with high blood pressure have primary HTN.**[3]** Alcohol consumption has long been reported to be associated with hypertension. According to the NFHS 4 data the prevalence of hypertension among females and males in Assam are Slightly above normal (140-159/90-99) :11.7%; Moderate hypertensive (160-179/100-109): 3%; very high (>= 180/>= 110) : 1.3% & Slightly normal :15%, moderate :3.1%; Very high : 1.5% respectively.

The prevalence of alcohol consumption among males and females in the state of Assam according to NFHS 4 data are 35.6% and 6.9% respectively. [4]

There is increasing evidence that alcohol initiates central as well as peripheral reactions which in a synergistic manner have a hypertensive action. In addition, alcohol induces an increased sympathetic outflow, most probably linked to secretion of corticotrophin releasing hormone[5].

Some investigators have suggested that the association between alcohol and hypertension is related to the temporal sequence of alcohol use and blood pressure measurement[6].

Several studies reported increased sympathetic nervous system activation and discharge of sympathetic amines after alcohol consumption[7].

Alcohol may cause hypertension by affecting the autonomic nervous system[8].

However, alterations in the sympatho-adrenal function that occur during ageing may cause older people to have a different reaction to factors triggering their autonomic system than do younger individuals[9].

The increased sympathetic outflow is expected not only to induce adrenoreceptor- mediated reactions (vasoconstriction, heart rate increase) but to stimulate oxidation reactions[10].

Certain studies have implicated the role of cortisol in alcohol-induced rise in blood pressure[11].

Potter *et al*[12] have reported a significant rise in plasma cortisol levels following alcohol consumption and a drop in plasma cortisol levels when alcohol intake was discontinued.

Imbalance of specific endogenous vasoconstrictor such as angiotensin II, endothelin-1 and nor-epinephrine and vasodilator nitric oxide (NO) may also play an important role in alcohol-induced hypertension. Alcohol stimulates the release of endothelin 1 and 2 from vascular endothelium in a dose dependent manner[13].

Alcohol also increases the angiotensin II levels in the blood and vessels[14].

Recent studies have shown that chronic ethanol ingestion induces hypertension which was related to increased aortic inflammation, elevated angiotensin II levels, induction of NADPH oxidase causing endothelial injury, depletion of antioxidants, down-regulation of endothelial NO generating system and impaired vascular relaxation in rats[15].

The present study was conducted with the following objectives:

1) To assess the prevalence of hypertension and alcohol consumption among the rural adult population of Kamrup district, Assam.
2) To assess alcohol consumption as a risk factor for hypertension.

METHODOLOGY:

The present study is conducted as a community based cross sectional study, in the rural areas of Kamrup district, Assam for a period of one year (August 2015- July 2016). The study was conducted among adults aged 30 years and above. Sample size was calculated using the formula n = 4pq/L, where p=31.7%(prevalence of HTN in eastern rural India, taken from the study done by Raghupathy et.al, Systematic review & meta-analysis, published in the Journal of Hypertension ,June 2014), q= 100-p, L=10 % of p. The sample size is calculated to be 866, which is rounded up to 870. Kamrup (Rural) district has a total of 13 PHCs, of which taking 50%, 6 PHCs are randomly selected. 2 sub centers from each of 6 PHCs are selected randomly. This gives us a total of 12 sub centers, included in the study. From each sub center, 1 villages are randomly selected. To get a sample size of 870, 73 respondents are randomly selected from each village.

Data collected by using pre-designed, pre-tested interview schedule followed by physical examination (using sphygmomanometer, stethoscope). Interviews were conducted by house to house visit. Pregnant women, acutely ill patients & those who did not give consent for the study was excluded. Obtained from the Institutional Ethics Committee. BP was measured using mercury column sphygmomanometer using standard technique in the sitting posture , with the back supported, leg uncrossed and after the subject had rested for at least 5 minutes .The BP is recorded in the right arm using cuff of standard size with instrument at the level of individual's heart. The cuff pressure was inflated 30 mm Hg above the level at which radial pulse disappeared and deflated slowly at the rate of 2mm Hg per second and the reading recorded to the nearest 2 mm. The first and fifth korotkoff sound were taken indicative of SBP and DBP respectively. Two readings were taken at 5 minutes interval and average of the two reading is taken as individual BP. If the difference between the two measurement is more than 5mm Hg, additional reading is taken and the average of 3 reading is considered as individuals BP. Participants who had taken food, tea, coffee, alcohol or who had smoked or done any strenuous physical activity were made to rest for 30 minutes before recording the BP. According to JNC VIII th recommendation, systolic BP >= 140 mmHg or diastolic BP >= 90 mm Hg is taken as hypertensives. In the present study hypertensives are defined as those person who fulfills the criteria of JNC VIII and those on hypertensive medication. Data analysis done by using INSTAT GRAPH PAD, and a p value of < 0.05 is taken as significant.

OPERATIONAL DEFINITION FOR ALCOHOL USE:

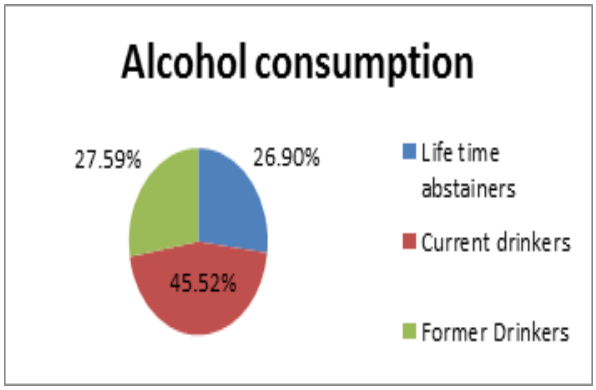
- Current Drinker: Current drinker is defined as a person who has consumed alcohol everyday or some days in the last 30 days.
- Former Drinker: Former drinker is defined as a person who used to consume alcohol but stopped taking alcohol 12 months ago
- Lifetime abstainer : Life time abstainer is defined as a person who never consumed 1 or more drinks of any type of alcohol.
- Frequency of alcohol consumption: The frequency of alcohol consumption was asked and classified as:
  - Daily
  - 1-5 days/week
  - 1-5 days/ month
  - Occasionally

RESULTS:

Table 1: Distribution of respondents according to Blood Pressure.

Blood Pressure level	Number of respondents	Percentage (%)
Normal	252	28.96
Pre hypertensives	240	27.58
Stage 1 hypertensives	198	22.75
Stage 2 hypertensives	180	20.68
Total	870	100

Table 1 shows majority , 252 (28.96%) respondents were normotensive, followed by 240 (27.58%) were pre hypertensives, and least number of respondents i.e 180 (20.68%) were hypertensive with stage 2.



Pie diagram showing distribution of respondents according to alcohol consumption.

Table 2: Distribution of respondents according to alcohol consumption and hypertension.

Alcohol use	Hypertensive		Non hypertensive		Total	
	No.	%	No	%	No.	%
Non users/ Life time abstainer	30	7.94% (12.82%)	204	41.46% (87.18%)	234	26.90%
Users						
Current Drinkers	234	61.90% (59.09%)	162	32.92% (40.90%)	396	45.52%
Former Drinkers	114	30.16% (47.5%)	126	25.61% (52.5%)	240	27.59%
Total	378 (43.45%)		492 (56.55%)		870	

*Row wise percentage in the parenthesis

$[X^2] = 130.38$, df= 2, $p < 0.0001$

Table 2 shows, 26.90%, were life time abstainer of alcohol, 27.59% were former drinkers and 45.52% were current drinkers. The prevalence of hypertension was highest ,59.09%% among the current drinkers , followed by 47.5% among the former drinkers and least, 12.82% among the life time abstainers. Out of all hypertensive maximum were current drinkers (61.90%). The association of alcohol consumption and hypertension is statistically significant.

Table 3: : Distribution of respondents according to frequency of alcohol consumption and hypertension.

Frequency of alcohol consumption	Hypertensive		Non Hypertensive		Total	
	No.	%	No.	%	No.	%
Daily	105	44.87% (71.42%)	42	25.93% (28.57%)	147	37.12%
1-5 days / week	70	29.91% (67.96%)	33	20.37% (32.04%)	103	26.01%
1- 5 days / month	41	17.53% (53.95%)	35	21.60% (46.05%)	76	19.19%
Occasionally	18	7.69% (25.71%)	52	32.10% (74.29%)	70	17.68%
Total	234 (59.09%)		162 (40.91%)		396	

Total234 (59.09%)162 (40.91%)396*Row wise percentage in the parenthesis.

$[X^2] = 45.699$, df = 3, $p < 0.0001$

Table 3 shows, among the current alcohol consumers, 37.12% of the respondents drinks daily, followed by 26.01% who drinks 1-5 days/week. The prevalence of hypertension was highest, 71.42% among those who consume daily, followed by 67.96% among those consuming 1-5 days/ week and least ,25.71% among those consuming alcohol occasionally. Out of the total hypertensive maximum were daily drinkers. The association of hypertension and frequency of alcohol consumption is statistically significant.

Table 4: Distribution of respondents according to socio demographic variables.

Socio – demographic variables	No. of respondents, n= 870	Percentage (%)
Age: 30-39 yrs	294	33.79
40- 49 yrs	264	30.34
50- 50 yrs	258	29.65
>= 60 yrs	54	6.20
Gender: Male	276	31.72
Female	594	68.28
Religion: Hindu	720	82.76
Islam	102	11.72
Christianity	48	5.52
Type of family:	526	60.46
Nuclear	344	39.54
Joint		
Education: Illiterate	282	32.41
Primary school	239	27.47
High school	145	16.67
HSLC	85	9.77
HS passed	74	8.51
Graduate and above	45	5.17

Discussion:

In the present study, the prevalence of hypertension was found to be 43.45%, with stage 1 22.75% and stage 2 20.68% among the respondents. Among the respondents life time alcohol abstainers were 26.9% and 73.1% were alcohol users. Among the alcohol users, 45.52% were current drinkers and 27.59% were former drinkers. The prevalence of hypertension was highest ,59.09%% among the current drinkers , followed by 47.5% among the former drinkers and least,

12.82% among the life time abstainers. Out of all hypertensive maximum were current drinkers (61.90%). The association of alcohol consumption and hypertension is statistically significant.

Among the current alcohol consumers, 37.12% of the respondents drinks daily, followed by 26.01% who drinks 1-5 days/week. The prevalence of hypertension was highest, 71.42% among those who consume daily, followed by 67.96% among those consuming 1-5 days/ week and least ,25.71% among those consuming alcohol occasionally. Out of the total hypertensive maximum were daily drinkers. The association of hypertension and frequency of alcohol consumption is statistically significant.

IConsistent to our findings , the Nurses' Health Study II and the Women's Health Study, reported , women with greater alcohol intake had a higher risk of hypertension [16].

In the Physicians' Health Study, the predominantly European-American men also had higher risk of hypertension if they drank more than 5 drinks per week, and there was no association with incident hypertension in men who drank less [17].

In observational studies, moderate alcohol consumption has been associated with lower incidence of cardiovascular diseases such as coronary artery disease, stroke, heart failure, and peripheral vascular disease [18].

Observational studies provide inconsistent results, reporting that moderate alcohol consumption is

1) associated with decreased incident hypertension [19],
2) associated with increased incident hypertension [20], or
3) not associated with hypertension at all [21].

The relations may differ by race or gender, with some studies suggesting that alcohol consumption is linearly related to incident hypertension in one race or gender but not others
in the same cohort [22].

A fairly consistent finding is that heavy drinking (usually defined as >2 drinks/day) is associated with increased blood pressure and incident hypertension
[23].

Inconsistent to our findings Corrao et. al (2000)[24] & Reims et. al (2004) [25] reported , teetotalers have higher average blood pressure than those who drink alcohol in small quantities .

Okubo et. al (2001) [26]reported in their study , a nonlinear relationship, especially in women, and some authors have speculated that ingestion of smaller quantities of alcohol may reduce blood pressure.

Xin et. al (2001)[27] reported conversely, that systolic blood pressure falls by 2–4 mmHg with reduction in alcohol intake.

Stranges et. al (2004) [28]concluded from their study that alcohol consumed outside meal times appears to have an effect on blood pressure risk which was independent of the amount .

Malinski et. al (2004)[29] did a closer examination of drinking patterns and also reveals that men consuming two or more drinks per day show little or no association for increased total and CVD mortality, and the detrimental effects of heavy drinking may begin to appear with three or more drinks a day .

Skliros et. al (2012) [30], in recent epidemiological and clinical studies have demonstrated that chronic ethanol consumption (more than three drinks per day, 30 g ethanol) is associated with an increased incidence of hypertension and an increased risk of cardiovascular diseases.

Conclusion The present study clearly depicts the health status of the rural adult population, in terms of non communicable disease. Hypertension being one of the common non communicable diseases is not only afflicting the urban population but also the rural population. Alcohol consumption is an established risk factor for hypertension. Alcohol consumption is in increasing trend in the productive age group of the community specially the tribal community residing the rural areas of Assam. The present study highlights the increasing trend of alcohol use in the rural areas. The prevalence of hypertension is significantly higher among those with alcohol consumption. Increased level of awareness generation is necessary to develop among the rural population to adopt healthy life style and to go for regular health check up. Behavioural change communication is one of key factor that can help people to get sensitized about the ill effects of alcohol consumption.

7. Limitation The present study was a community based cross sectional study . Due to the limitation of time & as it was an one man study so many factors cannot be assed. Alcohol consumption was solely assed based on the interview of the participants. A cohort study design is best suitable for the subject matter being assed, but due to the time constraints community based cross sectional design is being selected.

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