Jr. Anth. Survey of India, 61 : 1 (223-231), 2012

Prevalence of Hypertension among Santal Individuals Addicted to Alcohol

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ABSTRACT

Studies have indicated that increased consumption of alcohol leads to an increase of systolic and diastolic blood pressures. However, such studies on ethnic communities of India are rare. The present study attempts to understand the effects of alcohol consumption (in this case particular country-brewed hard liquor) on systolic and diastolic blood pressures among the Santals in a West Bengal village. The results indicate that this alcohol consumption has a statistically significance effect on systolic blood pressure among Santal male individuals.

INTRODUCTION

Hypertension is often referred to as high blood pressure. An individual is considered to be hypertensitive if he/she possesses systolic blood pressure (SBP)3 140 mm Hg and/or diastolic blood pressure (DBP)3 90mm Hg (Stranges et al., 2004). Chronic hypertension is a “silent” killer causing changes in blood vessels and retina, abnormal thickening of heart muscles, kidney failure, and brain damage. There has been innumerable number of scientific literature on hypertension. It is the leading cause of heart disease in the United States, affecting twenty five percent of the adult American population (Rapport, 1999).

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Hpertension is caused by a number of factors such as genes, age, obesity, alcohol intake, excessive intake of salt and a sedentary lifestyle. Ethnic group can also be another factor as hypertension prevalence has been shown to rise more rapidly with age among Blacks than Whites in the United States (Geronimus et al., 2007). Increased body mass index also further elevated blood pressure (Kastarinen et al., 2007). Multivariate analysis of potential risk factors showed age over 40 years, worker & smokers and stress were independently associated with an increased risk of essential hypertension (El-Shafei et al., 2002). It has also been reported that significant relationship existed between blood pressure, age, obesity and the workplace (Ledesert et al., 1994). Other recent studies are those on hypertension during pregnancy (Carvalho et al., 2006) and relation with diabetes mellitus (Martinez and Latorre, 2006) and coronary heart disease (Cosin-Aguilar et al., 2006). Studies have also focused on the role of various parameters that can serve as predictors of hypertension. The study of Peixoto et al. (2006) on the role of waist circumference and body mass index as predictors of hypertension can be cited here.

Alcoholism is a condition in which an individual loses control over his alcohol intake. This condition is characterized by repeated drinking of alcoholic drinks to such an extent that exceeds customary use or compliance with the social customs of the community and adversely affects the drinker's health and interferes his/her social or economic activities. Broadly alcoholism has four major dimensions: (i) excessive intake of alcoholic drinks (ii) individuals begin to increasing worry over the drinking (iii) loss of control over the process of drinking and the quantity consumed and (iv) the disturbance in functioning in the social world. Consumption of alcohol leads to a number of clinical effects. Alcohol consumption has been shown to be associated with decreased antiretroviral uptake, adherence and viral suppression among HIV patients (Chander et al., 2006). Chronic alcohol consumption also seemed to constitute a strong risk factor for pancreatic necrosis (Papachristou et al., 2006) and liver fibrosis (Jamal et al., 2005). Children exposed to alcohol in the prenatal period suffer from fetal alcohol syndrome and characterized by a distinct pattern of craniofacial malformations, physical and mental retardation (Sant'Anna and Tosello, 2006). It was further observed by Reid et al. (2002) that consumption of alcohol was a demonstrated risk factor for several adverse cognitive outcomes.

Hypertension and alcohol dependence have been linked by epidemiological surveys and clinical observations and there has been a number of studies in this regard. A significant prospective relationship was shown for the first time between heavy drinking and risk of developing high blood pressure by Dyer et al. (1981). The lowering of blood pressure after stopping alcohol consumption and its rise after starting to take alcohol again were good evidences of a causal relationship between the two (Lang et al., 1985). In the United

States where hypertension has been linked to the regular consumption of three or more standard alcoholic drinks a day, Miller et al. (2006) very recently discussed the Accelerating Alcohol Screening-Translating Research into Practice project. This project was designed to improve detection and management of alcohol problems in primary care patients with hypertension. In another review, Miller et al. (2005) pointed out that heavy alcohol consumption (three or more standard drinks per day) was associated with hypertension. Miller et al. (2005) further highlighted the importance of routine evaluation of alcohol consumption using alcohol biomarkers in hypertensive patients. In yet another review, Huntgeburth et al. (2005) discussed the relationship between alcohol consumption and hypertension, and also highlighted the consequences on cardiovascular risk. Indian studies include those of Hazarika et al. (2002), Gupta et al. (1995), Gopinath et al. (1994) and Chadha et al. (1990).

In India, a number of ethnic communities consume alcohol and as a matter of fact, drinking country-brewed liquor forms an integrated part of their social life. The Santals are one such community numbering more than three million in India. They are mostly concentrated in the four states of Jharkhand, Bihar, Orissa and West Bengal The main objective of the present study was to understand the relationship between alcohol consumption and hypertension as characterized by SBP and DBP among the Santals.

Material and Methods

The present study was conducted in a Santal village in the state of West Bengal during the period of January-February 2006. The village is situated under Kumarganj Block of Dakshin Dinajpur district of West Bengal. During the collection of the data, drinking of only one particular form of hard country-brewed alcohol locally called as ‘Cholai’ has been taken into consideration. The conventional data collection methods like interview and observation have been utilized to collect data on the drinking habits. For measuring blood pressure, the method and guideline provided by Pickering et al. (2005) has been followed. The blood pressure has been taken from adult male Santal individuals (n=38). The important points that have been followed at the time of blood pressure measurements were:

- The subject was seated comfortably with the legs uncrossed, with the back supported and upper arm bared without constructive clothing.
- The arm was supported at heart level, and the bladder of the cuff was encircled to at least 80% of the arm circumference.

- The mercury column was deflated at 2-3 mm/s. and the first and last audible sounds should be taken as SBP and DBP.
- Neither the subject nor the observer was talking during taking the measurement.
- For more accurate result, the measurements were taken at early morning from the subject on empty stomach
- The blood pressure was taken three times and the mean recorded.

For the classification of the type of drinkers, a modified classification given by Cahalan (2003) has been adopted and followed in the present study. The drinkers were grouped into two groups based on the basis of frequency of drinking:

a) Light drinker, who drinks once or twice a month.

b) Moderate-heavy drinker, who drinks three or four times in a month to who drink every day or several drinks during the day.

The data was statistically analyzed using Systat (http://www.systat.com/). Descriptive statistics and paired t-test were utilized for the statistical analysis.

Results and Discussion

Female individuals were excluded from the present study as the frequency of drinking country-brewed alcohol was found to be almost negligible among them. Of the total male population of the village (n=145), 38 were classified as drinkers. They were further classified into light drinkers (n=25) and moderate-heavy drinkers (n=l9). Blood pressure was taken from 19 light drinkers and 19 moderate-heavy drinkers, so as to keep the number of drinkers in both these categories identical. The means, standard deviations and ranges of SBP and DBP of these two groups are given in Table 1. The SBP of the moderate-heavy drinker group was 134.20 mm Hg as compared to 118.79 mm Hg in the light drinker group. Similarly, the moderate-heavy drinker group showed elevated DBP (87.21 mm Hg) than the light drinker group (81.47mm Hg). Evidently the mean systolic and diastolic blood pressures of the moderate-heavy drinkers were elevated as compared to those obtained for the light drinkers. To assess the differences between the mean SBP and DBP between the two groups, the paired t-test was utilized. The results of the paired t-test are shown in Table 2. The t-value was statistically significant ($p<O.05$) when the means of the SBP was compared between the light drinkers and the moderate-heavy drinkers ($t=3.55$, d.f.: 18). However, the t-value was not statistically significant ($p>0.05$) when the means of the DBP was compared between the two groups ($t=1.91$, d.f.: 18).

Yoshita et al. (2005) tried to determine the association of alcohol consumption with years-long blood pressure change and concluded that the baseline SBP after multivariate adjustment was significantly higher in drinkers than in non drinkers ($p<0.00l$). Using a multivariate logistic regression model, Hazarika et al. (2002) showed that consumption of country-brewed alcohol intake was found to increase the risk of hypertension. Cushman (2001) has reported that a relationship existed between consumption of three or more alcoholic drinks daily and hypertension, and further observed that reduction in alcohol intake was associated with lowering of blood pressure in randomized clinical trials. It has also been shown by Nakanishi et al. (2001) that there was an increase in the risk for hypertension in a dose-dependent manner as alcohol intake increased in middle-aged Japanese men. Malhotra et al. (1999) reported that one of the various risk factors among hypertensives as compared to normotensives were alcohol consumption. Significant correlations were also reported between SBP and measures of both recent and lifetime alcohol consumption in men by York and Hirsch (1997). Gopinath et al. (1994) also showed that regular alcohol consumption was a significant risk factor for hypertension. A study carried out during a hypertension-screening program in Hungary showed a direct and significant relationship existed between the quantity of alcohol consumed and SBP ($p<0.001$) and DBP ($p<0.05$) (Mohaesi et al., 1991). It was also shown that consumption of alcohol was significantly associated with greater risk of hypertension among men (Laforge et al., 1990). After controlling for other risk factors, these authors further reported significant effects for hypertension among men who on average consumed more than one drink/day.

The results of the present paper show that although alcohol consumption led to an increase in both SBP and DBP, the effect was more pronounced on SBP. The results are in broad agreement with many of the studies already done and discussed above. The nature of this relationship between hypertension and consumption of alcohol still remains unresolved. There are a number of mechanisms by which hypertension is generated while consuming alcohol. Vasoconstriction effects and modification of smooth muscles are some of the well-established factors of alcohol-induced hypertension. Moreover, a reduction of alcohol consumption provokes a significant diminution of hypertension. It has been observed by Kodavali and Townsend (2006) that a reduction in blood pressure of up to an average of 4 mm Hg. Reduction in alcohol consumption was also associated with a significant dose-dependent lowering of mean SBP and DBP (Miller et al., 2005) there is also a dearth of such studies on various ethnic communities in India where consumption of alcohol has found a place in their daily life. Moreover, the present study has dealt with consumption of a particular form of country-brewed alcohol (‘Cholai’) only. There is also consumption of other forms of alcohol whose association with hypertension needs to be investigated.

Table 1: Means, Standard deviations and ranges of SBP and DBP among Light drinkers and Moderate-heavy drinkers in the present study

Category	N	Mean	Standard Deviation	Range
Light drinker: Systolic BP	19	118.79	10.26	100.00-138.00
Moderate-heavy drinker: Systolic BP	19	134.20	15.36	100.00-160.00
Light drinker: Diastolic BP	19	81.47	13.50	60.00-105.00
Moderate-heavy drinker: Diastolic BP	19	87.21	10.23	65.00-105.00

Table 2 Results of Paired t-test between the SBP and DBP of light drinkers and moderate-heavy drinkers

Light drinker vs. Moderate-heavy drinker	t-value	Degree of freedom	Level of significance
SBP	3.55	18	P<0.05
DBP	1.91	18	P>0.05

Acknowledgements

The authors appreciate the help and cooperation of the Dept. of Anthropology, University of North Bengal in conducting this Study.

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