

AN EPIDEMIOLOGICAL STUDY OF HYPERTENSION AND DIABETES WITH SPECIAL REFERENCE TO ALCOHOL AND TOBACCO ADDICTION AND TREATMENT COMPLIANCE IN ABOVE 40 YEARS AGE GROUP IN A SLUM AREA OF CHENNAI

Dr. S. H. Ali

1. Dr Ali. S. H, Assistant Professor, Community Medicine, Rajamuthiah Medical College, Chidambaram

CORRESPONDING AUTHOR-

Dr Syed Hubbe Ali,
Rajah Muthiyah Medical College campus,
Chidambaram.
Email- drsyed_ali@rediffmail.com

ABSTRACT:

Context: India is in a stage of epidemiological transition, facing a dual burden of communicable and non- communicable diseases; and as in developed countries the non- communicable diseases in India are assuming a more menacing proportion. A recent Chennai Corporation survey found that at least one in five people in Chennai's slums had hypertension and more than one in ten had diabetes. **Aims:** To assess the prevalence of hypertension and diabetes in above 40 years age group in a slum area of Chennai and to study the association of these diseases with addiction to alcohol and tobacco. The study also focuses on compliance of patients to treatment for hypertension and diabetes. **Settings and Design:** Urban slum in Chennai, Cross sectional study. **Materials and Methods:** Present study was undertaken in a slum in Chennai in persons above 40 years age group. One slum was selected randomly and the households in the slum were sampled by a systematic random sampling method. A pre-designed and pre-tested questionnaire was used to collect information regarding the socio-demographic profile, past history of hypertension and diabetes, history of addiction to alcohol and tobacco (smoking or chewing) and compliance to treatment for known hypertensive's and diabetics. **Statistical analysis:** The prevalence was expressed in percentage and the Chi square test was used to find association with the factors. **Results:** The prevalence of Hypertension was 39.17% and Diabetes was 15.49%. The overall prevalence of addiction to alcohol, smoking and/or tobacco among study population in males was 74.86% and females 50.23%. In male study population the prevalence of addiction among hypertensive's and diabetics was 93.54% ($p<0.001$) and 96.77% ($p<0.001$) respectively. In female study population the prevalence of addiction among hypertensive's and diabetics was 62.02% ($p<0.005$) and 37.28% ($p<0.05$) respectively. Compliance to treatment was more in females as compared to males. **Conclusion:** There is a rising prevalence of hypertension and diabetes among the urban slum dwellers. Addiction to alcohol and/or tobacco was found to be an important factor contributing to the

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causation of hypertension and diabetes. Compliance to treatment was poor among males as compared to females.

Key Words: Hypertension, Diabetes, Addiction, Treatment Compliance.

INTRODUCTION:

WHO Inter- Health research project has shown that non- communicable disease prevalence rate in developing countries was similar to that in advanced nations 30 years ago. The emergence of this non- communicable disease cluster “The New- World Syndrome” appears to be a result of socio- economic and demographic changes (WHO 1994). The non communicable diseases, which contributed to 29% of DALY loss in 1990, are projected to rise to 57% by AD 2020 (1). Hypertension and Diabetes are becoming an important public health problem worldwide. A recent report on the Global burden of hypertension indicates that nearly 1 billion adults (more than a quarter of the world’s population) had hypertension in 2000, and this is predicted to increase to 1.56 billion by 2025 (2). The World Health Organization and the International Diabetes Federation, among others, have already warned that more than half of new diabetics will be from disadvantaged communities as many of them will not be able to afford cost of treatment.(3). India is in a stage of epidemiological transition, facing a dual burden of communicable and non-communicable diseases; and as in developed countries the non- communicable diseases in India are assuming a more menacing proportion (1). Population-based surveys conducted in limited areas to study risk factors for various diseases and mortality has reported information on tobacco use (4). Alcohol abuse, cigarette smoking and other forms of tobacco use are key risk factors for non-communicable diseases like hypertension and diabetes (5). Since, there are not many studies on significance of addiction on hypertension and diabetes in India, the present study was under taken on epidemiology of hypertension and diabetes with reference to alcohol and tobacco addiction. Also compliance of patients towards treatment of hypertension and diabetes were studied.

MATERIALS AND METHODS:

The present study was a community based, cross sectional study carried out in an urban slum in Chennai among persons aged 40 years and above from December 2011– March 2012. Ethical clearance was obtained. From 10 zones of Chennai, zone five was randomly chosen by a lottery method. There were 66 slums in zone five, from among which one slum was randomly chosen by a lottery method. The selected slum has a population of 11,041. The total number of households was 2122 (source- updated family register of the selected slum). All 2122 houses were surveyed using complete enumeration technique. House to house approach was used for the initial enumeration. During the survey a total of 2650 persons above the age of 40 years were found to be residing in this slum. Out of these, 30% i.e. 794 subjects were included for the study and

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interviewed by using a pretested, formatted, close ended proforma. The first house was selected by random sampling technique. All persons in this household in above 40 years age group were interviewed. The next house was selected by systematic sampling technique by taking every Kth house by below formula

$$K = \frac{\text{Total population above 40 year}}{\text{Sample size desired}} = \frac{2650}{30\% \text{ of total}} = \frac{2650}{30\% \text{ of } 2650} = \frac{2650}{794} = 3.33$$

Thus every third house was selected for the study and all persons above 40 years in a particular house were interviewed till a total of 794 persons were interviewed. Information regarding socio- demographic profile was questioned. The persons were also enquired about the known history of hypertension and diabetes. Also addiction to alcohol and tobacco was enquired. Use of tobacco in any form such as smoking beedi or cigarette and chewing tobacco with betel quid (paan), with or without lime paste, with or without supari, or in the form of gutkha (mawa) was enquired. The duration of addiction was categorized as less than 5 years, 5 to 15 years and more than 15 years. The blood pressure of every individual was checked with a mercury column sphygmomanometer. The blood glucose level of study subject was measured using a glucometer and a random capillary blood was used for measuring blood glucose.

Hypertension was classified as per "Association of Physicians of India"(6). Diabetes was classified as per "Diagnostic values for oral GTT and Clinical classification of Diabetes Mellitus"(7).

RESULTS:

The overall prevalence of hypertension (HTN) in this urban slum was 39.17% (males 49.45% and females 30.37%). The prevalence of diabetes (DM) was 15.49% (males 14.48% and females 16.36%)

Sex	Persons with HTN (n)	Persons with DM (o)	Study Population (p)	Prevalence Rate %	
				HTN n/p x 100	DM o/p x 100
Males	181	53	366	49.45	14.48
Females	130	70	428	30.37	16.36
Total	311	123	794	39.17	15.49

Table 1: Prevalence of Hypertension and Diabetes in study population

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Majority of male study subjects were addicted to smoking, alcohol and tobacco and females were addicted to tobacco chewing. Among males 274 (74.86%) and females 215 (50.23%) were addicted to some form of addiction to alcohol, smoking or tobacco chewing.

Addiction	Males		Females	
	N	Percent %	N	Percent %
Smoking + Alcohol + Tobacco	105	28.69	26	6.07
Smoking + Alcohol	42	11.48	0	0
Alcohol + Tobacco	24	6.56	9	2.10
Smoking + Tobacco	18	4.92	17	3.97
Smoking	34	9.29	0	0
Tobacco	22	6.01	163	38.08
Alcohol	29	7.92	0	0
NIL	92	25.14	213	49.77
Total	366	100	428	100

Table 2: Distribution of addiction among study population.

With reference to duration of addiction, 64.25% were addicted for more than past 15 years.

Duration of addiction years	Smoking + Alcohol + Tobacco		Smoking + Alcohol		Alcohol + Tobacco		Smoking + Tobacco		Smoking		Tobacco		Alcohol		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
<5	16	12.0	0	0	0	0	5	15.38	0	0	1	0.78	0	0	22	5.78
5-15	29	22.14	1	23.80	0	0	7	19.23	1	33.33	3	15.26	0	0	11	29.97
>15	86	65.92	3	76.19	3	103	2	65.38	2	66.67	18	83.96	29	100	24	64.25
Total	131	100	4	100	3	103	3	100	3	100	22	100	29	100	38	100

Table 3: Duration of addiction among study population.

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Among hypertensive's 93.54% males and 62.02% females were having some form of addiction to tobacco and/or alcohol in any form.

	Hypertension		No Hypertension		Total	
	N	%	N	%	N	%
Addicts	169	93.54	105	56.59	274	74.86
Non Addicts	12	6.46	80	43.41	92	25.14
Total	181	100	185	100	366	100

Table 4: Relationship between addiction and hypertension in Males. Chi square= 65.17 at P<0.001 @d.f.=1. (Table value= 10.83)

	Hypertension		No Hypertension		Total	
	N	%	N	%	N	%
Addicts	81	62.02	134	45.09	215	50.23
Non Addicts	49	37.98	164	54.91	213	49.77
Total	130	100	298	100	428	100

Table 5: Relationship between addiction and hypertension in Females. Chi square= 10.89 at P<0.005 @d.f.=1. (Table value= 7.88)

Among diabetics 96.77% males and 37.28% females were having some form of addiction to tobacco and/or alcohol in any form.

	Diabetes		No Diabetes		Total	
	N	%	N	%	N	%
Addicts	51	96.77	223	71.15	274	74.86
Non Addicts	2	3.23	90	28.85	92	25.14
Total	53	100	313	100	366	100

Table 6: Relationship between addiction and diabetes in Males. Chi square= 15.03 at P<0.001 @d.f.=1. (Table value= 10.83)

	Diabetes		No Diabetes		Total	
	N	%	N	%	N	%
Addicts	26	37.28	189	52.77	215	50.23
Non Addicts	44	62.72	169	47.23	213	49.77
Total	70	100	358	100	428	100

Table 7: Relationship between addiction and diabetes in Females. Chi square= 5.74 at P<0.05 @d.f.=1. (Table value= 3.84)

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92% females and 80% males having both Diabetes and Hypertension were taking treatment regularly. Defaulter rate was higher in male diabetics i.e. 42.86%

Disease	Sex	Total Cases	Regular Treatment		Irregular Treatment	
			N	%	N	%
Hypertension	Male	141	87	61.53	54	38.47
	Female	88	57	64.28	31	35.72
Diabetes	Male	27	15	57.14	12	42.86
	Female	40	26	66.00	14	34.00
Hypertension + Diabetes	Male	66	53	80.00	13	20.00
	Female	72	66	92.00	6	8.00

Table 8: Compliance to Treatment

DISCUSSION:

The study was carried out in an urban slum of Chennai, to find out the prevalence of hypertension and diabetes and its association with addiction to alcohol and tobacco (smoking and chewing) in above 40 years age group. The prevalence of hypertension in the study subjects was found to be 39.17% (males 49.45% and females 30.37%). A similar study conducted in Chennai (CURES-52) in 2007, showed the prevalence of hypertension as 20% (males 23.2% and females 17.1% $P < 0.001$) (8). Blood pressure rises with age in both sexes and the rise is greater in those with higher initial blood pressure (9). A study conducted in the urban areas of Chennai during 2000 (age group ≥ 40) reported a higher prevalence of hypertension (54%) among low income group (monthly income $< \text{Rs } 30000/\text{annum}$ and 40% prevalence among high-income group (monthly income $\geq \text{Rs } 60000/\text{annum}$) (10). Hypertension is more common in men as compared to women up to 50 years after which the percentage of females with hypertension increases as compared to males (11) The prevalence of diabetes in the study subjects was found to be 15.49% (males 14.48% and females 16.36%). Another study conducted in Chennai showed the prevalence of diabetes in urban and rural Chennai as 13.5% and 6.9% respectively (12). Studies from urban Chennai reported the prevalence of diabetes at 11.6% in the year 1995 and 14% during 2000 (10). 74.86% males and 50.23% females were having some sort of addiction to alcohol, smoking or tobacco chewing or a combination of these among study population. Among males 28.69% were addicted to alcohol, smoking and tobacco chewing and among females 38.08% were addicted to tobacco chewing. Studies done in Tamil Nadu have shown that the prevalence of tobacco smoking among middle aged (35-69 yrs) men is 38% in urban area and 47% in rural area and among females less than 1% irrespective of their area of residence(13). 64.5% addicts were in habit of addiction for more than past 15 years. Tobacco use increases with increasing age.(13). Among hypertensive's 93.54% males and 62.02% females were having some form of addiction to tobacco and/or alcohol

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in any form. It is well established fact that tobacco smoking is a cause for rise in blood pressure. Nicotine in tobacco causes increased secretion of catecholamine's causing rise in blood pressure (14). Among diabetics 96.77% males and 37.28% females were having some form of addiction to tobacco and/or alcohol in any form. Extensive intake of alcohol can cause increased risk of diabetes by damaging pancreas and liver and by promoting obesity (15). 92% females and 80% males having both Diabetes and Hypertension were taking treatment regularly. Defaulter rate was higher in male diabetics i.e. 42.86%. This was probably due to silent nature of disease and lack of knowledge and awareness about regular treatment and hazards of irregular treatment. Regular treatment is defined as attending 75% of scheduled visits to health facility (49).

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