



## STUDY OF DETERMINANTS OF HYPERTENSION IN URBAN HEALTH CENTRE

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**ABSTRACT** **BACKGROUND:** Hypertension is a chronic condition of concern due to its role in a causation of coronary heart disease, stroke and other vascular complications. It is one of the major risk factors for cardiovascular mortality, which accounts for 20-50 percent of all deaths. In India, the trend is increasing due to changes in lifestyle.

**METHODOLOGY:** The present study is a Descriptive study carried out among patients attending OPD of urban health centre. All (594) patients with an age 20 years and above. were examined.

**RESULTS:** The prevalence of hypertension in urban area was 19.02%. Prevalence of hypertension was significantly more in elderly peoples (40.59%), class I socioeconomic status (42.86%), higher educational status i.e. Post- graduate (37.33%), widowed (34.34%), obese (39.24%) individuals.

**CONCLUSIONS:** The prevalence of hypertension is high in certain high risk groups which can be easily identified and preventive actions can be taken.

**KEYWORDS :** hypertension, urban area**INTRODUCTION:-**

- We live in a rapidly changing environment. Throughout the world, human health is being shaped by the some powerful forces: demographic ageing, rapid urbanization and the globalization of unhealthy lifestyles.
- One of the most striking examples of this shift is the fact that non-communicable diseases such as cardiovascular disease, cancer, diabetes and chronic lung diseases have overtaken infectious diseases as the world's leading cause of mortality<sup>1</sup>.
- One of the key risk factors for cardiovascular disease is hypertension - or raised blood pressure.
- Hypertension is a chronic condition of concern due to its role in a causation of coronary heart disease, stroke and other vascular complications.
- It is the commonest cardiovascular disorder, posing a major public health challenge to population in socioeconomic and epidemiological transition.
- It is one of the major risk factors for cardiovascular mortality, which accounts for 20-50 percent of all deaths<sup>2</sup>.
- Studies in India have shown an increasing trend in the prevalence of HTN among urban adults<sup>3</sup>. In India, between three and six decades, the prevalence of hypertension has increased by about 30 times among urban developers and by about 10 times among the rural inhabitants<sup>4</sup>.

**OBJECTIVES:-**

1. To estimate prevalence of hypertension among people of >20 years attending urban health centre.
2. To study determinants of hypertension in urban area.

**METHODOLOGY:-**

**Study Area:-** The present study has been carried out in OPD of Urban Health Center under Department of Community Medicine, Dr.V.M.Govt. Medical College, Solapur.

**Study design-**Hospital based Descriptive study.

**Period of Study:** The period of study was from 1 June 2018 to 31 June 2018 i.e. 1 months.

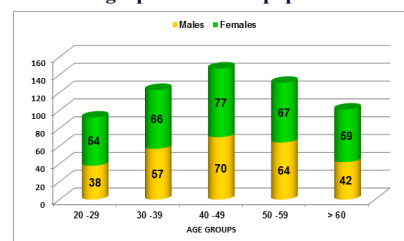
**Sample size<sup>5</sup>:** - Based on 47.9 % prevalence of hypertension<sup>6</sup> in adults in an urban area, the minimum sample size calculated was 384, so minimum sample size for study of hypertension was 384<sup>6</sup>. All (594) individuals >20 years of age group who were attending OPD of Urban Health Center was interviewed.

**Data collection:** All the individuals >20 years who were attending OPD of Urban Health Center were interviewed. Detailed history was taken, clinical examination was done. The hypertension was defined

according to eighth report of Joint National Committee on prevention, detection, evaluation and treatment of high blood pressure<sup>7</sup>. Socioeconomic status was judged using modified B.G. Prasad classification for May 2018<sup>8</sup>, Body Mass Index<sup>1</sup> is calculated by formula  $\text{Weight (kg)} / \text{Height}^2 (\text{m}^2)$ .

**Results:-**

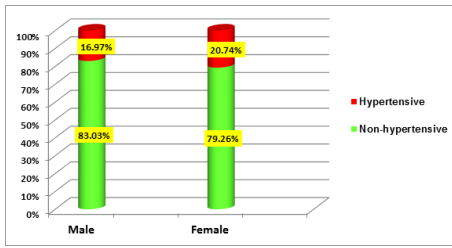
Chart No. 1 shows that amongst 594 study subjects 45.62 % were males & 54.38 % females. In this study maximum i.e. 24.75% of subjects belonged to age group of 40-49 & least i.e. 15.49% of subject belonged to 20-29 years age group. Table No. 1 shows that overall prevalence of hypertension in present study was 19.02%. The prevalence of hypertension was found to be increased gradually with increasing age. The prevalence of hypertension was maximum in age group  $\geq 60$  years (40.59%), followed by in age group 50-59 years (28.24%) while prevalence of hypertension was minimum in age group of 20-29 years (1.09%). The difference was found to be highly significant ( $P < 0.001$ ). Chart No. 2 shows that prevalence of hypertension was slightly higher in females (20.74%) than prevalence of hypertension in males (16.97%). Chart No. 3 shows that prevalence of hypertension was maximum among socioeconomic class I i.e. 42.86% and minimum among socioeconomic class V i.e. 14.20%. The prevalence of hypertension was increased gradually with higher socioeconomic class. The difference was found to be statistically highly significant ( $P < 0.001$ ).

**Chart No. 1 : Demographic Profile of population****Table No. 1:- Age wise prevalence of hypertension**

Age group in years	Total		Total
	Hypertensive (%)	Non-hypertensive (%)	
20-29	01 (01.09)	91 (98.91)	92
30-39	04 (03.25)	119 (96.75)	123
40-49	30 (20.41)	117 (79.59)	147
50-59	37 (28.24)	94 (71.76)	131
$\geq 60$	41 (40.59)	60 (59.41)	101
Total	113 (19.02)	481 (80.98)	594

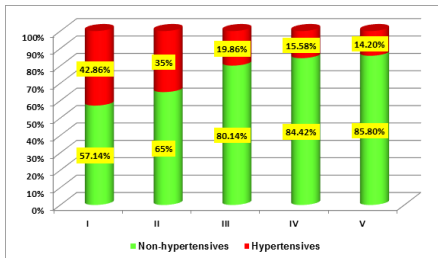
[Chi Square= 77.0, d.f.= 4,  $P < 0.001$ ; highly significant]

**Chart No. 2:- Gender wise prevalence of hypertension**



[Chi Square=1.36, d.f.= 1, P> 0.05; not significant]

**Chart No. 3:- Distribution of study subjects according to socioeconomic status**



[Chi Square=20.9, d.f.= 3, P< 0.001; highly significant]

Table No. 2 shows that the prevalence of hypertension was maximum in individuals with three generation family i.e. 22.67% while prevalence was found to be minimum in individuals with joint family i.e. 9.35%. The difference was found to be statistically significant (P < 0.05). Table No. 3 shows that Prevalence of hypertension was highest among individuals educated up to post graduation (37.33%) and lowest in illiterate individuals (08.51%). The prevalence of hypertension also increased highly significantly with the increase in literacy status (p < 0.001). Table No. 4 shows that prevalence of hypertension was maximum in widowed individuals (34.34 %) and minimum in unmarried (3.61%). The difference was found to be statistically highly significant (P < 0.001). Table No. 5 shows that prevalence of hypertension was minimum in individuals with Body Mass Index less than 18.5 i.e. 7.14%. The prevalence goes on increasing with increase in Body Mass Index and is maximum in individuals with BMI more than 30 (39.24%), The difference was statistically highly significant (P < 0.001). Prevalence of hypertension was more (19.51%) in individuals with salt intake more than 5 gm per day (Table No.6). The difference was not statistically significant (P > 0.05). Chart No. 4 and 5 shows that hypertension was found significantly more among individuals with family history of hypertension (29.17%) and family history of diabetes (32.10%).

**Table No. 2:- Distribution of study subjects according to type of family**

Type of family	Total		Total
	Hypertensive (%)	Non-hypertensive (%)	
Nuclear	52 (19.85)	210 (80.15)	262
Three generation	51 (22.67)	174 (77.33)	225
Joint family	10 (9.35)	97 (90.65)	107
Total	113 (19.02)	481 (80.98)	594

[Chi Square=8.56, d.f.= 2, P< 0.05; significant]

**Table No. 3:- Distribution of study subjects according to literacy status**

Literacy status	Total		Total
	Hypertensive (%)	Non-hypertensive (%)	
Illiterate	04 (08.51)	43 (91.49)	47
Primary education	04 (09.52)	38 (90.48)	42
Secondary Education	13 (12.38)	92 (87.62)	105
S.S.C	18 (17.65)	84 (82.35)	102
H.S.C	16 (18.39)	71 (81.61)	87
Graduate	30 (22.06)	106 (77.94)	136
Post- graduate	28 (37.33)	47 (62.67)	75
Total	113 (19.02)	481 (80.98)	594

[Chi Square=26.1 , d.f.= 6, P< 0.001; highly significant]

**Table No. 4:- Distribution of study subjects according to marital status**

Socioeconomic status	Total		Total
	Hypertensive (%)	Non-hypertensive (%)	
Married*	74 (18.59)	324 (81.41)	398
Unmarried*	03 (03.61)	80 (96.39)	83
Widowed	34 (34.34)	65 (65.66)	99
Divorcee/ Separated	02 (14.29)	12 (85.71)	14
Total	113 (19.02)	481 (80.98)	594

Rows with \* are merged for applying chi square

[Chi Square=24.90, d.f.= 2, P< 0.001; highly significant]

**Table No. 5:- Distribution of study subjects according to Body Mass Index (B.M.I.)**

Body Mass Index	Total		Total
	Hypertensive (%)	Non-hypertensive (%)	
< 18.5	03 (07.14)	39 (92.86)	42
18.5-24.9	27 (09.37)	261 (90.63)	288
25-29.9	52 (28.11)	133 (71.89)	185
≥ 30	31 (39.24)	48 (60.76)	79
Total	113 (19.02)	481 (80.98)	594

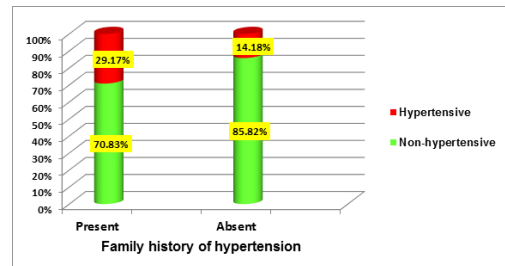
[Chi Square=52.10, d.f.= 3, P< 0.001; highly significant]

**Table No. 6:- Distribution of study subjects according to salt intake**

Salt intake per day	Total		Total
	Hypertensive (%)	Non-hypertensive (%)	
≤ 5 gram	49 (18.42)	217 (81.58)	266
> 5 gram	64 (19.51)	264 (80.49)	328
Total	113 (19.02)	481 (80.98)	594

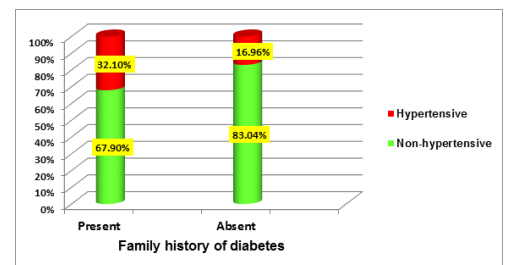
[Chi Square=0.11, d.f.= 1, P> 0.05; not significant]

**Chart No. 4 :- Distribution of study subjects according to family history of hypertension**



[Chi Square=18.90, d.f.= 1, P< 0.001; highly significant]

**Chart No. 5 :- Distribution of study subjects according to family history of diabetes**



[Chi Square=10.40, d.f.= 1, P< 0.05; significant]

**DISCUSSION:-**

In the present study, the overall prevalence of hypertension in study subject was found to be 19.02%. Table No. 1 shows that prevalence of hypertension was found to be increased gradually with increasing age. The prevalence of hypertension was maximum in age group ≥ 60 years (40.59%), followed by in age group 50-59 years (28.24%) while prevalence of hypertension was minimum in age group of 20-29 years (1.09%). The difference was found to be highly significant (P < 0.001).

**Pooja et al<sup>9</sup> [2013]** reported the overall prevalence of hypertension was 38.5% in an Urban Area of Uttarakhand. **Chandwani H et al<sup>10</sup> [2010]** reported prevalence of 24% among adults in the urban area of Jamnagar, Gujarat. **Mandal PK et al<sup>11</sup> [2010]** reported prevalence of hypertension of 19.8% among adult in an urban area of Kolkata. The above findings are comparable with these studies. Similar finding of statistically significant increase in prevalence of hypertension with increasing age was observed in other studies. **Gupta M et al<sup>12</sup> [2012]** found that the percentage in the age group of 20 to 30 years was lowest (15.7%) among hypertensive population whereas this percentage increased as the age advanced. The trend between increasing age and hypertension was found to be statistically significant. **Mahmood S E et al<sup>13</sup> [2011]** found that the proportion of hypertension also showed an increasing trend with age. Prevalence of hypertension was significantly ( $P < 0.05$ ) higher among individuals aged 40 years and above (20.0%) as compared to those aged below 40 years (7.4%).

Chart No. 2 shows that prevalence of hypertension was slightly higher in females (20.74%) than prevalence of hypertension in males (16.97%). However the findings were statistically not significant. Findings opposite to present study was reported by **Reddy SS et al<sup>14</sup> [2005]**. He reported that proportion of hypertension in males was slightly higher (9.6%) compared to that in females (7.6%) but the difference was not statistically significant. **Undhad AM et al<sup>15</sup> [2011]** also found that sex was not significantly associated with prevalence of hypertension. **Mahanta TG et al<sup>16</sup> [2008]** found that association of sex with hypertension was found to be insignificant.

Chart No. 3 shows that prevalence of hypertension was maximum among socioeconomic class I i.e. 42.86% and minimum among socioeconomic class V i.e. 14.20%. The prevalence of hypertension was increased gradually with higher socioeconomic class. The difference was found to be statistically highly significant ( $P < 0.001$ ). Similar findings were observed in study done by **Khadilkar HA et al<sup>17</sup> [2004]**. He found that Prevalence of hypertension was maximum (11.62) % in Class I Upper and minimum (2.76 %) in Class V Lower socioeconomic class. Also he found that the prevalence of hypertension increased significantly with increase in socioeconomic status ( $p < 0.05$ ). Similar significant association between socioeconomic status and prevalence of hypertension found in study done by **Rajasekar VD et al<sup>18</sup> [2012]**. In other studies done by **Mahmood SE et al<sup>19</sup> [2013]** and **Kalavathy MC et al<sup>20</sup>**, insignificant association between prevalence of hypertension and socioeconomic status was found.

Table No. 2 shows that the prevalence of hypertension was maximum in individuals with three generation family i.e. 22.67% while prevalence was found to be minimum in individuals with joint family i.e. 9.35%. The difference was found to be statistically significant ( $P < 0.05$ ). The possible reason for higher prevalence of hypertension among subjects with three generation family could be economical stress (as one or two adult earning with more dependents) and conflicts between mother in law and daughter in law. Similar finding of significant association between type of family and prevalence of hypertension was observed by **Rajasekar VD et al<sup>18</sup> [2012]** Similarly **Midha T et al<sup>21</sup> [2010]** found significant association of isolated systolic hypertension with the type of family ( $p=0.031$ ). But **Maroof KA et al<sup>22</sup> [2007]** found that type of family of the subjects was not significantly associated with prevalence of hypertension.

Table No. 3 shows that Prevalence of hypertension was highest among individuals educated up to post graduation (37.33%) and lowest in illiterate individuals (08.51%). The prevalence of hypertension also increased highly significantly with the increase in literacy status ( $p < 0.001$ ). The reason for higher prevalence of hypertension among highly educated people could be the related stress and tension due to sophisticated job. Similar findings were reported by **Khadilkar HA et al<sup>17</sup> [2004]**. He observed that the prevalence of hypertension also increased significantly with the increase in literacy status as prevalence of hypertension was highest (33.33 %) among postgraduate and least (3.38%) among illiterate. In contrast to our findings, **Manimunda SP et al<sup>23</sup> [2011]** found that increasing trend in the prevalence of hypertension with decreasing educational status ( $\chi^2$  for linear trend = 25.55,  $P < 0.001$ ) was statistically significant. He found that prevalence of hypertension among illiterate subjects was 59.8% and it was 10.2 % among subjects who went to college. **Gupta PC et al<sup>24</sup> [2004]** also observed significant decrease in hypertension with educational status in females ( $P < 0.01$ ), while the trend is not significant in males.

Table No. 4 shows that prevalence of hypertension was maximum in widowed individuals (34.34 %) and minimum in unmarried (3.61%). The difference was found to be statistically highly significant ( $P < 0.001$ ). The possible reason for higher prevalence of hypertension among widowed subjects could be combined effect of tension due to loss of spouse and stress of familial problems on single parent. Similar significant increased the risk of hypertension in subjects not living with spouse was observed by **Hazarika NC et al<sup>25</sup> [2004]**. Also **Mandal PK et al<sup>11</sup> [2010]** found that marital status was significantly associated with hypertension ( $p < 0.011$ ). In contrast to above studies, **Midha T et al<sup>21</sup> [2010]** found no significant association between marital status and hypertension ( $p = 0.213$ ).

Table No. 5 shows that prevalence of hypertension was minimum in individuals with Body Mass Index less than 18.5 i.e. 7.14%. The prevalence goes on increasing with increase in Body Mass Index and is maximum in individuals with BMI more than 30 (39.24%), The difference was statistically highly significant ( $P < 0.001$ ). This shows strong and statistically significant association between obesity and prevalence of hypertension. Similar findings were reported by **Midha T et al<sup>26</sup> [2009]**. She found that, 6.8% of the underweight subjects and 16.7% of the normal subjects (BMI = 18.5-25 kg/m<sup>2</sup>) were hypertensive, as compared to 50.0% of Grade I overweight and 68.4% of Grade II overweight subjects. These differences were statistically significant ( $p < 0.0001$ ). Also **Gothankar JS<sup>27</sup> [2011]** found association of obesity and hypertension statistically significant as out of 22 individuals with BMI  $\geq 25$ , 14 (63.64%) were hypertensives and among 31 individuals with BMI  $< 25$ , 9 (29.03%) were hypertensives. **Sagare SM et al<sup>28</sup> [2011]** found significant association between hypertension and BMI. In his study, 18.79 % of hypertensives were having BMI  $> 25$  and 81.21% of hypertensives were having BMI  $\leq 25$ . Prevalence of hypertension was more (19.51%) in individuals with salt intake more than 5 gm per day (Table No.6). The difference was not statistically significant ( $P > 0.05$ ). Similar insignificant association was observed in studies by **Reddy SS et al<sup>14</sup> [2005]** and **Agrawal R et al<sup>29</sup> [2012]**. In study done by **Reddy SS et al<sup>14</sup> [2005]**, significantly lower prevalence of hypertension was found with excess salt intake. This could be explained by the fact that almost all hypertensives had changed their dietary practices towards low salt intake probably under medical advice. But in contrast to our findings, significant association between prevalence of hypertension and salt intake was observed in studies done by **Prabakaran J et al<sup>30</sup> [2013]** and **Hazarika NC et al<sup>25</sup> [2004]**.

Chart No. 4 and 5 shows that hypertension was found significantly more among individuals with family history of hypertension (29.17%) and family history of diabetes (32.10%). This can be attributed to common genetic background, shared environment and lifestyle habits. Similar findings of significant association were observed by **Singh RB et al<sup>31</sup> [2011]**. In his study, family history of hypertension was significantly greater among subjects with prehypertension and hypertension when compared with those with normal blood pressure ( $p < 0.01$ ). He found that, 1.7% of normotensive females, 9.8% hypertensive females, 3% of normotensive males and 9.8% hypertensive males have family history of hypertension. Also **Kamlesh Kumar et al<sup>32</sup> [2013]** found that family history of elevated BP is one of the strongest risk factors for the future development of hypertension in individuals. **Chandra SK et al<sup>33</sup> [2011]** and **Pooja et al<sup>9</sup> [2013]** found insignificant association of family history of hypertension in contrast to our finding. Similar significant association with family history of diabetes was observed by **Mandal PK et al<sup>11</sup> [2010]**. In his study, family history of diabetes was present in 75.9% of hypertensives and 24.1% of normotensives. Family history of diabetes was absent in 13.9% hypertensives and 86.1% of normotensive. Prevalence of hypertension was high among the persons who had family history of diabetes (75.9%). Family history of diabetes was significantly associated with hypertension ( $p < 0.001$ ).

## CONCLUSION

- The overall prevalence of hypertension in study was 19.02%.
- Prevalence of hypertension was maximum in  $\geq 60$  years (40.59%) & minimum in 20-29 years (1.09%).
- Prevalence of hypertension was higher in females (20.74%) than males (16.97%).
- Prevalence of hypertension goes on increasing with socioeconomic status, lowest in class V (14.20%) & highest in class I (42.86%).
- Hypertension is found more prevalent in individuals belonging to

three generation family (22.67%) and least in individuals from joint family (9.35%).

- Prevalence of hypertension was highest among individuals educated up to postgraduate (37.33%) & minimum in illiterate individuals (8.51%).
- The prevalence of hypertension was maximum in widowed individuals (34.34%), minimum in unmarried (3.61 %).
- Only 7.14% individuals amongst those with BMI <18.5 were Hypertensive, while 39.24% of those having BMI of  $\geq 30$  were Hypertensive.

#### RECOMMENDATIONS:-

- (1) 'High risk' screening programmes should be implemented, especially targeting at individuals at risk of developing hypertension like
  - elderly people,
  - diabetic individuals,
  - smokers,
  - alcoholic,
  - individuals with family history of hypertension etc.
- (2) Awareness campaign through good quality Information Education and Communication (I.E.C) activities should be carried out to sensitize the hidden hypertensives to get themselves examined and get detected as hypertensives.
- (3) People with higher socio-economic status, high educational status, smokers and living in families with distorted relations should be kept under surveillance for early detection of hypertension.

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