

Original article

Current status of the ‘rule of halves’ of hypertension: a survey among the residents of slum resettlement colony from east Delhi.

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Abstract

Background: Despite the high prevalence; prevention, detection, treatment, and control of hypertension is still suboptimal and unsatisfactory. The utility of ‘Rule of halves’ of hypertension rule has often been questioned.

Objective: To find out the current status of the validity of the rule of halves of hypertension in 20-59 years population in a slum-resettlement of east Delhi.

Methods: The present study was carried out in the field practice area of the department of Community Medicine, UCMS, Delhi from August 2010 to February 2012. Three hundred and ten (310) subjects aged 20-59 years were selected through multistage systematic random sample. Blood pressure of all the subjects was measured according to JNC VII recommendations. Among the hypertensive-subjects with prior diagnosis of hypertension / high BP were considered as ‘aware’; those with current antihypertensive drug therapy as ‘treated’; and subjects showing SBP<140, DBP<90, and taking antihypertensive medication as ‘controlled’. SPSS ver 17 was used for analysis. Fischer’s exact test was used.

Results: The total prevalence of hypertension according to JNC VII was 17.4%. About 26 (48.1%) of hypertensive subjects were aware of their hypertensive status. Of the hypertensive subjects only 21 (38.9%) were on treatment and the

difference among males and females on treatment was statistically significant. Of those on treatment only 10 (18.5%) subjects had their blood pressure controlled. Out of total 21 (38.9%) who received treatment, 14 (25.9%) were treated irregularly and remaining 7 (13%) regularly.

Conclusion: Detection and control of hypertension in the population of slum resettlement colony of Delhi is unsatisfactory and the ‘rule of halves’ for hypertension seems to be holding true in this population.

Key-words: rule of halves, hypertension, slum area.

Introduction:

It is now established that non-communicable diseases especially cardiovascular diseases (CVD) are major causes of death and disability in low income countries including India.¹ Over 80% of CVD deaths occur in low- and middle-income countries as their populations are more exposed to risk factors, and have less access to preventive efforts.² Hypertension has been reported as seventh contributor to premature death in developing countries.³ High blood pressure (BP) is one of the most important risk factors for CVD, and it has been shown that the reduction of highly or moderately elevated BP levels results in a decrease in stroke and myocardial infarction rates.^{4,5}

Despite the high prevalence; prevention, detection, treatment, and control of hypertension is still suboptimal and unsatisfactory not only in well-developed⁶ countries but also in developing countries like India.³ With a growing epidemic of non-communicable diseases in developing countries, particularly India, data on prevalence, awareness and control of these diseases are of great importance.

'Rule of halves' states that 'half of hypertensive patients are not known to health services (i.e. remain undiagnosed), half of those with known hypertension do not receive any treatment and half of those who are treated, do not achieve adequate control.'⁷ The utility of this rule has often been questioned.⁸ Therefore the objective of the present study was to find out the current status of the validity of the rule of halves of hypertension in 20-59 years population in a slum-resettlement of east Delhi.

Material and methods:

The present community based cross-sectional study was carried out in Nand Nagri, a slum resettlement of East Delhi which comes under field practice area of the department of Community Medicine, University College of Medical Sciences (UCMS), Delhi from August 2010 to February 2012. It has a population of over 50,000 and mostly falling in the category of low socio-economic status.

The published population-based data showed prevalence of hypertension among 20-59 years subjects from Delhi's JJ clusters/resettlement colonies to be 27.5%.⁹ Adequate sample size for random sample computed to be 306 at 95% confidence level, at 'p' – 0.275 with absolute precision ('d') of 0.05. After rounding off, over 310 subjects aged 20-59 years were selected through multistage systematic random sample. One sub block was randomly selected from each of the five blocks of the study area. Sampling unit was a household, a household was randomly selected from first 20

households (sampling interval for 5%). Thereafter, starting from that household, every 20th household was selected. All the 20-59 years subjects, residing in the selected household for 6 months or more, were included in the study. If there were no eligible subject in the selected household – or the house was closed for 3 consecutive visits, it was replaced by a contiguous household without disturbing the allocation of next 20th sampling unit.

Blood pressure of all the subjects was measured according to JNC VII / American Heart Association (AHA) recommendations. JNC guidelines¹⁰ were followed for defining awareness, treatment and control of hypertension. Among the hypertensive's - subjects with prior diagnosis of hypertension/high BP were considered as 'aware'; those with current antihypertensive drug therapy as 'treated'; and subjects showing SBP<140, DBP<90, and taking antihypertensive medication as 'controlled'. Relevant socio-demographic data of the individuals was also recorded. Ethical committee approved the study. Informed consent was obtained from the study participants.

The collected data was entered in Microsoft Excel. Coding of the variables was done. Statistical Package for Social Sciences, version 17 was used for analysis. Interpretation of the collected data was done by using descriptive statistics like percentages and means. Fischer's exact test was used.

Results:

The total prevalence of hypertension according to JNC VII was 17.4%. About 26 (48.1%) of hypertensive subjects were aware of their hypertensive status. Of the hypertensive subjects only 21 (38.9%) were on treatment and the difference among males and females on treatment was statistically significant. Of those on treatment only 10 (18.5%) subjects had their blood pressure controlled. Out of total 21 (38.9%) who received treatment, 14 (25.9%) were treated irregularly and remaining 7 (13%)

regularly. Among irregular treatment receivers, proportion of females was noticeably high (42.8%) as compared to males (7.7%) though the difference was not statistically significant. (Table 1) (Figure 1)

About 15 (36.6%) subjects in the age group 50-59 years were hypertensive. While 8 (5.8%) subjects of 20-29 age group were hypertensive ($p=0.000$). Awareness was found in 10 (66.7%) subjects in age group 50-59 years and 1 (12.5%) subjects in 20-29 years age group. About 9 (60.0%) subjects in 50-59 years age group were taking treatment as compared to 0 (0.0%) subjects in 20-29 years age group. About 4 (26.7%) subjects each in the age group 50-59 years and 40-49 years had their blood pressure controlled. (Table 2)

Discussion

The rule of halves of hypertension was put forth way back in 1990 based on the findings of a cross-sectional community based survey conducted in Scotland.³ Various authors across the globe have often raised an issue regarding the validity of this rule from time to time. However studies from Sweden¹¹ and Italy¹² have confirmed that rule of halves is still valid in their population. This is in contrast to the study by De Henauw S¹³ who reported that the rule of halves is no longer valid in Belgian adult population.

Another report from Finland⁸ which analysed 14 years (1983-1997) publications on hypertension reported that the rule of halves is no longer valid in industrialized countries but rule might be valid for developing countries. In our study, we found that the rates of awareness, treatment and control were 48.1%, 38.9% and 18.5% respectively.

Not surprisingly, the rates of awareness and treatment were much lower in the developing countries as compared to the developed countries. This can be explained by the fact that the price of the antihypertensive medication can be extremely high relative to local income

thus making it unaffordable to most hypertensive subjects. This comes in agreement with Strasser T who pointed out the cost difference of antihypertensive drug treatment among various countries.¹⁴

In the present study we observed that the prevalence of hypertension was more among males as compared to females. This result is in cohort with other studies from Greece¹⁵ and Canada.¹⁶ This finding can be attributed to the fact that male gender has relatively more access to the health care services. Due to this selective access to medical examinations, men get more frequently screened than women. This observation is in contrast to the study by Tazi MA et al from Morocco¹⁷ (30.2% for men vs 37.0% for women).

It was observed in the present study that females received more (42.8%) irregular treatment as compared to males (7.7%). Several reports on status of gender analysis on utilisation of health care services from various parts of our country have shown that females usually have less access to health care as compared to male counterparts.¹⁸

Regarding gender differences in the areas of awareness, treatment and control rates, women achieve better awareness, treatment and control rates than men. This study also confirms the results concluded by other studies from France and Israel.^{19,20}

It was found in this study that study subjects in the age group of 50-59 years had maximum prevalence of hypertension than any other age group. The prevalence was 5.7%, 19.3%, 31.9% and 36.6% in age groups 20-29, 30-39, 40-49 and 50-59 yrs age group, respectively. The progressive increase of hypertension prevalence with age is a typical finding in all the related studies.^{15,21}

It was seen that the levels of awareness and treatment increased many fold from the younger to the older age group. A probable explanation for this rise in awareness could be that young subjects had never measured their BP before. As far

as treatment is concerned, this difference could imply that young people usually assume that suffering from 'hypertension' is a disease of older age.

The reasons for the failure to control high BP levels adequately are complex to understand. Doctor's perceptions of BP control are more optimistic than reality. Majority of physicians blame poor patient's compliance as the main cause for treatment failure, while most patients claim to be compliant and blame the lack of efficacy and side effects.²²

In the view of low levels of awareness, treatment and control presented in the present study it can be concluded that the detection and control of hypertension in the population of slum resettlement colony of Delhi is unsatisfactory and the 'rule of halves' for hypertension seems to be holding true in this population.

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Table 1: Sex wise distribution of burden of hypertension.

Gender	No.	HT	Aware	Treated (total)	Treated (irregular)	Treated (regular)	Under Control
N= HT by JNC VII							
Male	146	26 (17.8)	8 (30.8)	4 (15.4)	2 (7.7)	2 (7.7)	2(7.7)
Female	164	28 (17.1)	18 (64.3)	17 (60.7)	12 (42.8)	5 (17.8)	8 (28.6)
Total	310	54 (17.4)	26 (48.1)	21(38.9)	14 (25.9)	7 (13.0)	10 (18.5)
p (χ^2)		0.991 (ns)	0.014 (s)	0.020 *(s)	0.061 *(ns)	1.000 *(ns)	0.458 *(ns)

Figures in parenthesis indicate percentage, *Fischer’s exact test used.

Table 2: Age wise distribution of the burden of hypertension

Age	No.	HT	Aware	Treated (total)	Treated (irregular)	Treated (regular)	Under Control
20-29	139	8 (5.8)	1(12.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
30-39	83	16 (19.3)	7 (43.8)	6 (37.5)	6 (37.5)	0 (0.0)	2 (12.5)
40-49	47	15 (31.9)	8 (53.3)	6 (40.0)	2 (13.3)	4 (26.7)	4 (26.7)
50-59	41	15 (36.6)	10 (66.7)	9 (60.0)	6 (40.0)	3 (30.0)	4 (26.7)
Total	310	54 (17.4)	26 (48.1)	21 (38.9)	14 (25.9)	7 (13.0)	10 (18.5)
p (χ^2)		0.000 (s)	0.096 *(ns)	0.291 *(ns)	0.056 *(ns)	0.144 *(ns)	0.923 *(ns)

Figures in parenthesis indicate percentage, *Fischer’s exact test used.

