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A CROSS SECTIONAL STUDY TO ASSESS PHARMACOTHERAPEUTIC ADHERENCE AMONG HYPERTENSIVE PATIENTS IN TERTIARY CARE HOSPITAL

Richa Gaur[1], Dr. Pooja Agrawal[1]*, Virendra Kushwaha[1], Saurabh Agrawal[2] and Amit Kumar[1]

[1]Department of Pharmacology, G.S.V. M. Medical College, Kanpur, Uttar Pradesh, India.
[2]Department of Medicine, G.S.V. M. Medical College, Kanpur, Uttar Pradesh, India.

***Corresponding Author: Dr. Pooja Agrawal**
Department of Pharmacology, G.S.V. M. Medical College, Kanpur, Uttar Pradesh, India.

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ABSTRACT
Background: Effective prevention of cardiovascular events in people with hypertension requires most appropriate control of blood pressure. Despite come closer in management, poor adherence to antihypertensive medications is often reported as the major reason attenuating treatment efficacy. The objective of the study was to determine current antihypertensive medication adherence in India. **Material and Methods:** Hospital based cross-sectional study design was conducted from April 2017 to June 2018. The data was collected by interviewing hypertensive patients receiving antihypertensive medications using Morisky's four item scale questionnaire. The data were analyzed with chi square test. **Results:** From the 76 patients of hypertension, when asked about adherence to their medications: 73 (96.50%) of them did not forget to take the drugs, 64 (84.56%) of patients reported that they had been being careful in taking their medications, 54 (70.49%), 67 (88.71%) patients did not stop medications when they felt better and when they felt worse while taking medications respectively. **Conclusions:** This study revealed a moderate level of adherence among the participants.

KEYWORDS: Hypertension, medication adherence, Morisky's scale.

INTRODUCTION
According to the WHO (2003) adherence to treatment is "the extent to which a patient's behavior: taking medication, following a diet, or making healthy lifestyle changes, corresponds with agreed-upon recommendations from a health-care provider".

Hypertension is an overwhelming global challenge, which ranks third as a means of reduction in disability-adjusted life-years. Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. This accounts for 57 million disability adjusted life years (DALYS) or 3.7% of total DALYS. Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to be doubled by the year 2020. It affects approximately one billion people worldwide. Annually, it causes 7.1 million (or one-third of) global preventable premature deaths. Due to the fact that hypertension is one of the most important modifiable risk factors for cardiovascular diseases. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease (CHD) deaths in India.[1] Therefore, access to treatment with antihypertensive medication and compliance with treatment are key factors in the control of hypertension. Hypertension, the leading cause of mortality is poorly controlled worldwide. The failure to control hypertension takes an unacceptable toll on patients and their families. In addition to the personal cost, to the individual patient, uncontrolled hypertension creates huge, avoidable economic burdens when viewed in terms of the general population.[2]

Hypertension is known as abnormally high systolic or diastolic blood pressure levels. It means continual systolic blood pressure (SBP) equal to or greater than 140 mmHg and/or continual diastolic blood pressure (DBP) equal to or greater than 90 mmHg. This increasing of (SBP) and (DBP) is well distinguished as an important risk factor for brain stroke, coronary heart disease (CHD), End stage kidney disease (ESKD) and surprising dying.[3]

There is a lack of understanding of which patient groups are at greatest risk of low adherence, how barriers to medication-taking behavior influence low adherence, and what interventions are most effective in overcoming barriers and improving adherence rates in different patient populations.[4]

MATERIAL AND METHODS
Study Setting
Study was conducted by department of pharmacology in collaboration with the department of internal medicine at

a tertiary-care teaching hospital over a period of 15 months commencing from April 2017 to June 2018.

Study design - A cross-sectional, observational study.

Source of Data
The patients who attended the outpatient clinic of L.L.R. Hospital, G.S.V.M. Medical College, Kanpur, U.P. diagnosed with hypertension were included in this study.

Selection of study subject
Patients were included after evaluating for inclusion and exclusion criteria. The written informed consent was taken from each patient before enrollment in the study.

The study was started after getting the ethical clearance from institutional ethics committee.

Inclusion and exclusion criteria
Inclusion criteria

- Subjects who were on prescription medications for hypertension.
- Subjects of age above 18 years were included.
- Subjects of taking medication for more than 1 month were included.

Exclusion criteria

- Subjects of age below 18 years were excluded.
- New diagnosed patients were excluded.
- Patients who were very ill and not able to answer the question were excluded from the study.
- Study subjects who were taking other forms of medications (Ayurvedic and Homeopathic)
- Subjects with hearing/cognitive impairment were excluded.

Methods
This study was a community based, cross sectional, observational study. 76 hypertensive patients were enrolled in our study.

The selected patients were interviewed regarding their socio-demographic characteristics, income, duration of drug intake and reasons for nonadherence to medicine by using a preformed questionnaire. The study subjects were grouped into the socioeconomic classes modified kuppuswamy scale for 2018 for urban population and modified B.G. Prasad scale for rural population. The questions were translated and explained to the patients in Hindi language.

Before assessment of adherence in patients, we excluded the patients suffer from depression, anxiety, stress as per DASS scale. Adherence was assessed through the specific four question patient questionnaire related the Morisky's scale.

Statistical Analysis
The data were analyzed with chi square test and statistical significance set at $P<0.05$.

RESULT
The present study was conducted at internal medicine department and department of pharmacology in G.S.V.M. Medical College, Kanpur.

Socio-demographic variables in hypertensive patients –
Total of 76 hypertensive patients were involved in this study. The response rate was 100%. Among the total of 76 respondents, 54 (71.05%) were males and 50 (28.95%) were females. In males mean age was 55.8+8.1 years and in females mean age was 52.7+8.6 years. Majority of patients were of age group 41-60 years i.e. 64.47%, patients of age group >60 years i.e. 30.26% and patients of age group 18-40 years i.e. 5.26%. Large proportion of patients were urban 66 (86.84%) with residence. Among the urban population, as per kuppuswamy classification, majority of patients i.e. 45.45% belongs to Socio- economic Class IV. 37.88% belongs to Socio- economic Class III and 16.67% belongs to Socio- economic Class II. In rural population as per B.G. Prasad classification equal number of patients belongs to Socio- economic class II and Class I.

Nearly half i.e. 43.42% of the patients had been diagnosed with hypertension within the duration of 5 years, 38.16% of the patients had been diagnosed with hypertension within the duration of 6-10 years and 18.42% of the patients had been diagnosed with hypertension with the duration of more than 10years.

Table 1: Morisky's instrument: Question wise percentage of Medication adherence.

S. N.	Four-question patient questionnaire (Morisky's instrument)	No. of patients who said 'No'(n=76)	Percentage (%)
1	Did you ever forget to take your medication?	73	96.50 %
2	Were you careless at times about taking your medication?	64	84.56 %
3	When you felt better, did you sometimes stop taking your medication?	54	70.49 %
4	Sometimes, if you felt worse when you took your medicine did you stop taking it?	67	88.71 %
The number of patients who said 'No' to all four questions were considered adherent to the prescribed anti-hypertensive treatment		34	44.74 %

Table 2: Morisky's Scale to ascertain Adherence.

Morisky's scale			
Nonadherence	**Adherence**	**Chi square value**	**p value**
42 (55.26%)	34 (44.74%)	0.84	>0.05

Note 1 P<0.05 significant
Note 2 Data analyzed with chi square test

Table-3: Patients distribution according to Adherence and Nonadherence level in different variables among Hypertensive patients.

Variables		Non adherence (n=42)	Non adherence %	Adherence (n=34)	Adherence %	Total (n=76)	Chi square value	p value
Gender	Male	28	51.85 %	26	48.15 %	54	0.8781	0.1744
	Female	14	63.64 %	8	36.36 %	22		
Age Group	18-40 years	3	75 %	1	25 %	4	0.7411	0.6904
	41-60 years	26	53.06 %	23	46.94 %	49		
	>60 years	13	56.52 %	10	43.48 %	23		
Residence	Urban	35	53.03 %	31	46.97 %	66	1.012	0.1583
	Rural	7	70 %	3	30 %	10		
Duration of Disease	<5years	16	48.48 %	17	51.51 %	33	1.177	0.5553
	6-10years	18	62.07 %	11	37.93 %	29		
	>10years	8	57.14 %	6	42.86 %	14		
Kuppuswamy Scale (Urban)	Class II (upper middle)	4	36.36 %	7	63.64 %	11	12.39	0.0020
	Class III (lower middle)	8	32 %	17	68 %	25		
	Class IV (upper lower)	23	76.67 %	7	23.33 %	30		
B G Prasad Scale(Rural)	Class I	3	60 %	2	40 %	5	0.4762	0.2451
	Class II	4	80 %	1	20 %	5		

Note 1 P<0.05 significant
Note 2 Data analyzed with chi square test

Table 4: Reasons of pharmacotherapeutic nonadherence among hypertensive patients.

S. N.	Four-question patient questionnaire (Morisky's instrument)	No. of patients who said 'Yes'	Percentage (%)
1	Did you ever forget to take your medication?	34	13.52%
2	Were you careless at times about taking your medication?	33	13.09%
3	When you felt better, did you sometimes stop taking your medication?	73	28.86%
4	Sometimes, if you felt worse when you took your medicine did you stop taking it?	36	14.34%

The number of patients who said 'Yes' to one or more than one of four questions were considered nonadherent to the prescribed treatment.

DISCUSSION

The prevalence of pharmacotherapeutic adherence to antihypertensive medications in hypertensive patients in our study was 44.74%. This finding is line with the previous study of Suzanne *et al* (44.1%)[5] in Hong Kong**.** In comparison to this finding, higher adherence was reported by Chythra R. Rao *et al.*[6] reported 82.2% adherence in hypertensive patients in Coastal Population of Southern India (Tamilnadu). Lower percentage of pharmacotherapeutic adherence was reported by A Kamran, *et al.*[7] (24%) in Iran when compared to above studies. In our study hospital was in closest to the patients which could be one of the reason for adherence and the methods employed in assessing the adherence to medication and the health care delivery system in different areas could partly explain the differing rates of compliance.

The prevalence of adherence to medications in males (48.15%) in comparison to females (36.36%) was good but that was not statistically significant. This finding is line with the previous study of Tong X *et al.*[8] Mostly females are less educated in comparison to males, they have limited knowledge towards their disease, medications and complications related to discontinuation of drugs leads to their being careless.

These hypertensive patients had higher adherence in age group 41-60 years and in >60 years were reported. This finding is line with the most of previous studies A Kamran *et al.*[7] in Ardabil city (Iran) reported higher

adherence among people above 60 years of age and in 30-39 years. Social support system among the families to take full responsibility for routine medications for the elderly is contributory to good medication adherence.

In our study hypertensive patients with pharmacotherapeutic adherence with duration of hypertension <5years (51.51%), 6-10 years (37.93%), >10 years (42.86%) were observed. During the early stage (0-5 years) of the disease patients tend to be more committed to their disease, but their commitment does not last long (6-10years) since they adapt the load and deterioration continues while patients with longer duration (>10years) of disease have gained more experience with disease, established a better physician-patient relationship and had greater trust on physicians' advice. In addition, they might become more knowledgeable about their own health condition and the appropriate management of disease control.

In our study urban patients (46.97%) were more adherent to medications in respect to rural patients (30%) but the result was not statistically significant. This finding is line with the previous study of Majeed H M *et al* (Baghdad).[3] This is because those in rural residences are more likely to give low attention to their medication being more distant from health care setting and are less likely to seek health information compared to urban residents.

In hypertensive patients class III (68%) and class II(63.64%), patients as per modified kuppuswamy classification of socioeconomic status were more pharmacotherapeutic adherent in comparison to Class IV (23.33%). As the patients in lower middle class were stic to the medications prescribed by physician and they have faith on physician's prescription but the patients in upper middle class population are well educated so they alter the medications continuation.

CONCLUSION

In our study according to the Morisky's instrument only 44.74% of the patients were adherent while 55.26% of the patients were non adherent among the total of 76 hypertensive patients, that was statistically insignificant ($p>0.05$).

Among urban population, our study shows that pharmacotherapeutic adherence was 68%**,** 63% among study participants of hypertensive patients in Class III (lower middle class) Class II(upper middle class) respectively of Kuppuswamy scale of socioeconomic status shows more pharmacotherapeutic adherence compared to class IV (Lower middle) i.e. 23.33%, that was statistically significant ($p<0.05$).

In our study, the major reasons found for medication non-adherence were they stopped/missed the medication when he or she felt better followed by they stopped/missed the medication when he or she felt worse while taking medicines followed by forgetfulness and carelessness.

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Declarations

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Conflict of interest: None declared.

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