

Compliance to prescribed medication among patients in a tertiary care hospital using Morisky-Green test

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Received: 07 December 2015

Accepted: 21 December 2015

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ABSTRACT

Background: Compliance to medication is an important factor in the success of any treatment. It also reduces the health care cost. The objective of the study was to examine compliance of patients to treatment and investigate reasons for such compliance and to quantify non adherence to medications and raise awareness about such factors.

Methods: A prospective cross sectional questionnaire based study was conducted in 300 patients during three month period in 2013. The inclusion criteria was patients aged >18 years of both sexes and on treatment for diseases like asthma, hypertension, diabetes and coronary artery disease. Compliance was assessed using Morisky-Green test. Data was analysed by SPSS 19 and Chi square test was used to analyse the contingency tables and $P \leq 0.05$ was considered significant.

Results: The study revealed a compliance of 40.7%. There was statistically significant association between compliance and younger age, lower level of education, low socio-economic status, acute disease and presence of comorbidity. The common causes for non-compliance were forgetfulness and side effects of drugs.

Conclusions: More than half of the study subjects were non-compliant. Hence a conscious effort is needed to educate the patients regarding their disease and the importance of compliance to treatment.

Keywords: Compliance, Medication, Morisky-Green test

INTRODUCTION

Non-compliance to treatment is a major hindrance to the effective delivery of health care worldwide. The World Health Organization in 2003 estimated that only about 50% of patients with chronic diseases in developed countries are compliant. The adherence rates for preventative therapies are even lower, and are about 28% in developing countries.¹ WHO defined compliance as, "the extent to which a patient takes medication, follows a diet, and/or executes lifestyle changes as per the recommendations of a health care provider."^{1,2} Compliance involves taking the prescribed medications, attending follow-up appointments and following the recommended lifestyle modifications.³⁻⁵

Non-compliance affects patient health, and the society as a whole as it causes complications like unsuccessful treatment of chronic diseases, untreated psychiatric illness, formation of resistant infections etc.¹ Non-compliance is the most important basis of treatment failure. The consequences of non-compliance increase the financial costs of public health services dramatically.^{6,7} Low rates of compliance to treatment for asthma, diabetes, and hypertension contribute substantially to the human and economic burden.¹

Very few studies have been done to understand factors influencing non-adherence to treatment even though poor compliance is a well-recognized problem in daily practice.⁸ Most of the studies have been conducted in developed countries. Very few studies have been done in

India.⁹ Furthermore, criteria to assess non-adherence are often arbitrary and not linked to clinical outcomes.

The present study was conducted based on the following objectives:

1. To study the compliance of patients to treatment and investigate factors determining such compliance.
2. To quantify non adherence to medications and raise awareness of such factors.

METHODS

A prospective cross-sectional study was conducted on 300 patients attending Pushpagiri Institute of Medical sciences and research centre, Tiruvalla, Kerala. The study was done for a period of 3 months from June 2013 to august 2013.

Patients were selected based on the following criteria:

1. Patients aged above 18 years of both sexes.
2. Patients known to be on medications due to various diseases such as Coronary Artery Disease, Diabetes, Asthma, hypertension etc.

The purpose of the study was explained to each patient. The patients who agreed to be a part of the study and gave a written informed consent were selected. The study was approved by the Institutional ethics committee.

Data was obtained from patients by a detailed structured questionnaire which was filled for each patient by the researcher.

The questionnaire consisted of - :

1. General information in which patient was classified into: Old/Young, Male/Female, Acute /Chronic disease, socio economic status-low/intermediate/high, and education level <10th std. or >10 std.
2. Specific information regarding compliance - Morisky-Green test was used for evaluating patient's compliance to medications; the Morisky-Green test consists of the following questions:
 - a) Have you ever forgotten to take medicine?
 - b) Are you sometimes negligent with regard to your medicine hours?
 - c) Do you skip your medicines when you are feeling well?
 - d) When you feel badly due to the medicine, do you skip it?

According to the protocol of the Morisky-Green test, patients were considered compliant to the treatment when they scored the maximum score of 4 points, and patients were considered non-compliant when they scored 3 points or less.^{3,10,11}

3. Patients who were non-compliant to treatment were evaluated in detail and the reasons for non-compliance such as forgetfulness/wasn't reminded to take medication, disbelief that drug is necessary or is helping, fear of addiction, experienced actual side effects, belief that medication would have a negative impact on performance of daily activities , desire to save money/poverty, confused by instructions, overwhelmed by number of drugs prescribed, difficulty in opening medication container and difficulty in swallowing medication were determined.

Data was analysed by SPSS 19. Chi-square test was used in the analysis of contingency tables. $P \leq 0.05$ was considered significant.

RESULTS

Table 1: Number of individuals compliant and noncompliant.

	Number (%)	Mean age (S.D.)
Compliant	122 (40.7)	46.75 (13.6)
Non-compliant	178 (59.3)	59.87(19.8)

Among the 300 patients studied, 122 (4.7%) were found to be compliant to the medications prescribed. The rest 178 (59.3%) were non-compliant. The mean age of patients who were non-compliant was 59.87 years (SD 19.8) and that of those who were compliant was 46.75 years (SD 13.6) which was lower than the non-compliant group (Table 1).

Out of 300 patients, 193(64.3%) were females and 107 (35.7%) were males. Among the 193 female patients, 110 (56.9%) were non-compliant and 83 (43%) were compliant. Among the 107 male patients, 68 (63.5%) were non-compliant and 39 (36.4%) were compliant. The gender distributions among the compliant and non-compliant groups were not significantly different (Table 2).

33 patients had education level lower than 10th standard and 267 patients had education level higher than 10th standard. Among the 33 patients with education level lower than 10th standard, 4 (12.1%) patients were non-compliant and 29 (87.8%) were compliant. Out of the 267 patients who had education level higher than 10th standard, 174 (65.2%) were non-compliant and 93 (34.8%) were compliant. This difference was statistically significant ($P < 0.0001$) as compliance was better in patients with education level lower than 10th standard. (Table 2)

219 (73%) study subjects had intermediate socioeconomic status, 65 (21.7%) low socioeconomic status and 16 (5.3%) high socioeconomic status. Compliance was found to be statistically significant

among patients who had low socioeconomic status ($P < 0.001$) (Table 2).

significantly more in patients having acute disease ($P < 0.0001$) (Table 3).

53 (17.7%) patients out of 300 had acute disease and 247 (82.3%) had chronic disease. Compliance was

Table 2: Compliance rate by Morisky Green test according to socio-demographic factors.

	Compliant (%) N = 122	Non-compliant (%) N = 178	Total (%) N = 300	Chi square	P value
Gender					
Male	39 (36.4)	68 (63.5)	107 (100)	1.22	0.26
Female	83 (43)	110 (56.9)	193 (100)		
Level of education					
<10 std	29 (87.8)	4 (12.1)	33 (100)	34.25	<0.0001
>10 std	93 (34.8)	174 (65.2)	267 (100)		
Socio-economic status					
Low	39 (60)	26 (40)	65 (100)	13.6	< 0.001
Intermediate	79 (36.1)	140 (63.9)	219(100)		
High	4 (25)	12(75)	16(100)		

Table 3: Compliance in acute and chronic disease.

	Compliant (%) N = 122	Non-compliant (%) N = 178	Total (%) N = 300	Chi square	P value
Acute disease	35 (66)	18 (33.9)	53 (100)	17.17	<0.0001
Chronic disease	87 (35.2)	160 (64.8)	247 (100)		

Table 4: Compliance among patients suffering from various diseases.

	Compliant	Non-compliant	Total	% non-compliant
Asthma	22	20	42	47.61
CAD	21	81	102	79.4
DM	55	50	105	47.61
HTN	16	13	29	44.8
DM, HTN	1	1	2	50
DM, CAD	2	8	10	80
HTN, CAD	5	3	8	37.5
HTN, Asthma	0	1	1	100
CAD, HTN, DM	0	1	1	100
Total	122	178	300	59.33

14% of the patients were suffering from Asthma, 34% from Coronary artery disease, 35% from diabetes, 9.7% from hypertension and remaining 7.3% had a combination of above diseases (Table 4).

The reasons for non-compliance were analysed and presented in Table 5. 98% of the non-compliance was due to forgetfulness. 61.2% of the patients did not inform the doctor about having stopped the medication. 44.4% of these patients restarted medication on their own once the unusual effects due to medicines had gone. 56% of the

people knew they had done the wrong thing by skipping medication. 63% of the non-compliant people were not aware of the effects of non-compliance.

DISCUSSION

Compliance to treatment is a relatively new area of research and not much study has been done in this field, especially in developing countries like India. This was a prospective cross sectional study done on 300 patients in a tertiary health centre among adults above 18 years of

age of both sexes. The participants in the study were patients on treatment for diabetes mellitus, asthma, hypertension and coronary artery disease. A direct interview by researcher was adopted in the study to increase the accuracy of data collected in comparison to self-completed questionnaires. Morisky-Green test was used for estimation of compliance of subjects to treatment.

Table 5: Reasons for indiscipline.

Forgetfulness/Wasn't reminded to take medication	98%
Experiencing actual side effects	59.6%
Belief that medication would have a negative impact on performance of daily activities	36%
Fear of addiction	14%
Disbelief that drug is necessary or is helping	10%
Confused by instructions	2%
Financial reasons	1%
Overwhelmed by number of drugs prescribed	1%
Difficulty opening medication container	1%
Difficulty swallowing medication	0.5%

In the present study, there were more female participants than males. The younger patients were more compliant to medication than older patients. This is in agreement with a study done in India and in contrast to a study by Linn et al.^{9,12} The reason for non-compliance in older patients may be due to forgetfulness. About 40.7% of patients were compliant to their treatment in our study. This is similar to a study done in Hong Kong, lower than other studies done in India, Uganda, Iraq and Palestine and higher than studies done in Mexico and Saudi Arabia.^{3,6,13-17}

There was no significant difference in compliance due to gender in our study. Similar results were found in other studies.^{2,5,18,19} Many studies have reported higher compliance in females.²⁰⁻²³ Few studies have shown higher compliance in males.¹⁴

In the present study, compliance was better in patients with lower education level (<10th std). This is similar to other studies.^{3,9,19,24} But some studies reported better compliance in subjects with higher level of education and some studies reported no relation between compliance and level of education.^{6,20,22} Patients with lower level of educational may have more faith in the doctor's advice and hence may be more compliant.

Compliance was higher in patients with low socio-economic status in our study. This is in agreement with another Indian study.⁹ No such association was reported in other studies.^{2,25}

Compliance was significantly higher in acute disease than in chronic disease in this study has found in other studies done in India and Poland.^{6,26} This is in contrast to the findings of other studies.^{2,3,27} Patients with two or more diseases had lower compliance than patients with single disease in our study. This is in contrast to findings of other studies.^{3,28}

The patients who were non-compliant to medication were interviewed in detail regarding the causes for non-compliance. Majority of the patients reported forgetfulness as the reason. Others stopped the medication when they experienced side effects or when they felt better. Some believed that it may affect their daily activities adversely.

CONCLUSION

Our study found that more than half of study subjects are non-compliant to their treatment. Hence a concerted effort is required to educate the patients regarding their disease and the treatment and to monitor the same so that their compliance can be improved.

ACKNOWLEDGEMENTS

We thank the staff of department of pharmacology of Pushpagiri Institute of medical sciences and research centre, Thiruvalla for their help and support.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Manasa MR, Preethy JK, Sachin ID. Compliance to prescribed medication among patients in a tertiary care hospital using Morisky-Green test. *Int J Basic Clin Pharmacol* 2016;5:21-5.