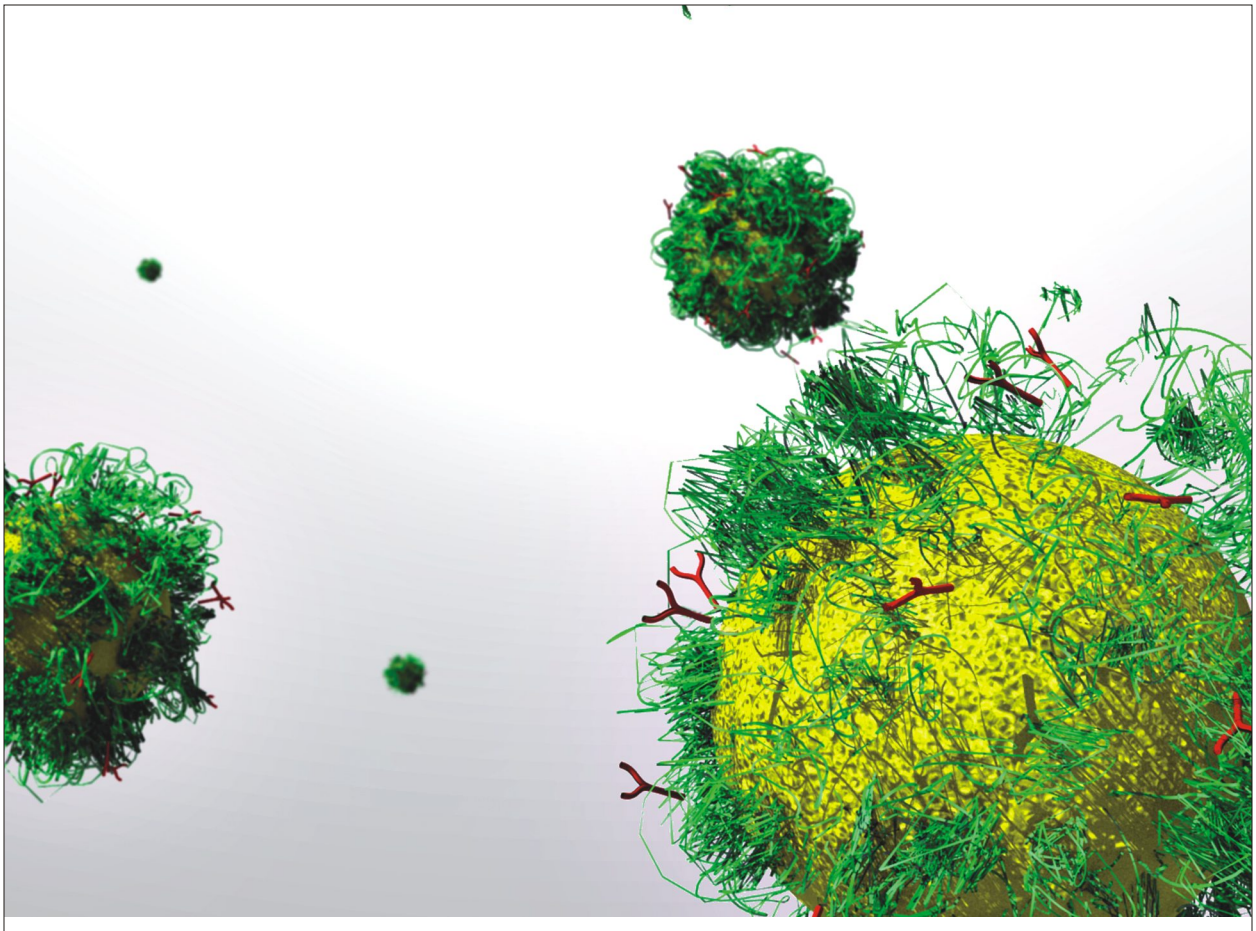

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Analyzing the Pattern of Prescription Noncompliance in Patients of Cardiac and Diabetic Clinic of a Tertiary Care Hospital

[3]Suranjana Banik, [1]Debasis Ray and [2]Shishir Kumar
[1]Department of Pharmacology,
[2]Department of Community Medicine,
[3]Agartala Government Medical College, Agartala, India

Corresponding Author: Suranjana Banik, Agartala Governtment Medical College, Agartala, India

ABSTRACT

To ascertain the prevalence and find possible causes of patient non-compliance to prescription medication in patients suffering from chronic diseases like Diabetes and Cardiac diseases attending in tertiary centre of the state. A total of 400 patients attending Cardiac and Diabetic clinic of AGMC and GBP Hospital and who were prescribed medications and other advices for at least for last one month or more were selected randomly and were interviewed as per preformatted questionnaire and were labeled as compliant or non-compliant as per their answers and possible reason/reasons of non compliance were enquired and data was analyzed statistically. As per this study, 286 (71.5%) were non-compliant and 114 (28.5%) were compliant. Various factors or causes exist behind noncompliance. Out of total 286 noncompliant patients, 205 patients (71.7%) cited forgetfulness as the reason of noncompliance. Non-compliance showed statistically significant relation with socioeconomic background of the patient ($p<0.01$), 193 (67.5%) out of 286 non-complaints said that they failed to purchase the drug due to economic reason. This study suggested forgetfulness and economic insufficiency as the main reason behind non-compliance. So drug supply to the patients at affordable prices, rational drug prescription should be encouraged. Besides reminder systems, counseling and role of physicians to motivate the non-compliant patients can reduce non-compliance and associated morbidity and mortality.

Key words: Non-compliance, forgetfulness, poor socioeconomic condition, rational drug therapy

INTRODUCTION

Noncompliance with therapy is a significant problem, particularly when the disease process is chronic and therapeutic regimens are employed for prolonged period (Singh *et al*., 1996). Medication compliance has received more attention in recent years; it is not a new problem (Blandford *et al*., 1999). Over the past 25 years literally thousands of articles have been published on the issue of medication compliance from various angles providing new information. But we still have yet to outline an optimal approach that ensures high compliance level. It is because medication non-compliance is a global healthcare problem, which is more costly and serious than a number of major illnesses (Wertheimer and Santella, 2003). Noncompliance is typically cited as occurring in from 50 to 75% of patients. More than 125000 Americans die each year due to prescription medication non-compliance, twice the number killed in automobile accidents (Wertheimer and Santella, 2003).

More than 17000 patients who were prescribed beta blockers after a myocardial infarction and had health insurance and prescription drug coverage, only 45% were adherent to beta blockers by 1 year after discharge; the biggest decrease in adherence occurred between 30 and 90 days (Albert, 2008). A WHO study estimates that only 50% of patients suffering from chronic diseases in developed countries follow treatment recommendations (WHO, 2003). The Wall Street Journal Online's Health Industry Edition reported that nearly 2/3rd (64%) report that they have simple forgotten to take their medication. Adherence differed according to drug class, age, ethnicity and island of residence. Overall adherence to oral hypoglycemic agents was low at 61.4%. Relative to sulfonylurea, the odds ratio of adherence was highest for metformin, followed by thiazolidinedione and lowest for α-glucosidase inhibitors. Relative to the age subset 55 to 64 years, adherence increased with older patients, reaching a peak at age 74, then decreased for patients aged 85 and older (Lee and Taira, 2005). It has been generally acknowledged for years that nonadherene rates for chronic illness regimens and for lifestyle changes are ~50%. As a group, patients with diabetes are especially prone to substantial regimen adherence problems. In general, research has shown that the diabetes regimen is multidimensional and adherence to one regimen component may be unrelated to adherence in other regimen areas (Delamater, 2006).

The reason for noncompliance varies from place to place and from one individual to the other. Tripura being one of the hilly North Eastern states of India, there is diversity in all aspects- in the population distribution, socioeconomic status, educational status, customs, beliefs, health care infrastructure, disease distribution pattern etc., which in one way or the other, often influence medication compliance and more so in patients with chronic illness. So the proposed study has been performed on the cardiac and diabetic patients in the state with an objective of estimating the status of non-compliance in the patients and finding the possible reasons of non-compliance and exploring possible solutions. The study can also help in analyzing adherence with respect to taking daily medication for the ailments, exploring role of the patient, pharmacist and the physician with respect to compliance. It will thus provide valuable information with regards to the medication compliance pattern prevailing in the state and open new ways for ensuring better Drug adherence among patients.

METHODS

This was a hospital based cross sectional study in cardiac and diabetic clinic of Agartala Govt. Medical College and G.B.P. Hospital, a tertiary care teaching hospital of the Tripura state. All study-related documents were approved by the Institutional Ethics Committee. A total of 400 patients were selected randomly from the Diabetic and Cardiac Clinic of AGMC and GBP Hospital. Inclusion criteria was, existing old recorded willing cases attending in the Diabetic and Cardiac Clinic of AGMC and GBP Hospital who were prescribed medications and other advices at least for last one month or more, irrespective of age, sex, caste, education, socioeconomic background were selected randomly. They were interrogated as per formatted closed questionnaire with open ended responses to find the pattern and causes related to noncompliance and data was recorded and analyzed statistically. Patients who have been prescribed medication for less than 1 month and those who refused to give consent were excluded from this study. Sample size of 400 patients attending diabetic and cardiac clinic of AGMC and GBP Hospital was calculated keeping confidence interval = 95% and allowable error = 10% of Prevalence (50%) (Wertheimer and Santella, 2003).

RESULTS

Out of 400 subjects recruited in this study, 286 (71.5%) were noncompliant and 114 (28.5%) were compliant. Table 1 shows the comparison of age, sex distribution and socio-demographic feature rates in compliant and noncompliant.

Out of Total 400 study subjects, 281 patients took 1-5 doses, 119 took 6 or more doses, per day and showed 69.4 and 76.5% noncompliance, respectively.

The distribution of number of medications/drugs and doses per day with reference to noncompliance and compliance has been shown in Table 2.

Table 3 shows the various factors or causes and the coexistence of different factors that exist behind the noncompliance. Out of total 286 noncompliant patients, 205 patients (71.7%) cited forgetfulness as the reason of noncompliance, 193 (67.5%) said that they failed to purchase the drug due to economic reason.

Table 1: Comparison of the sex distribution and socio-demographic feature rates in compliant and noncompliant

Variables (n)	Compliant (n = 114) N (%)	Noncompliant (n = 286) N (%)
Age distribution		
<= 39 years (70)	21 (30.0)	49 (70.0)
40-59 years (240)	67 (27.9)	173 (72.1)
>= 60 years (90)	26 (28.9)	64 (71.1)
Total	114 (28.5)	286 (71.5)
Sex distribution		
Female (203)	62 (30.5)	141 (69.5)
Male (197)	52 (26.4)	145 (73.6)
Total	114 (28.5)	286 (71.5)
Educational status		
Illiterate (71)	15 (21.1)	56 (78.9)
Primary (217)	66 (30.4)	151 (69.6)
Class X pass and above (112)	33 (29.5)	79 (70.5)
Total	114 (28.5)	286 (71.5)
Economic status Fig. 1**		
BPL (17)	1 (5.9)	16 (94.1)
Poor (87)	14 (16.1)	73 (83.9)
Lower middle class (243)	82 (33.7)	161 (66.3)
Middle class (53)	17 (32.1)	36 (67.9)
Total	114 (28.5)	286 (71.5)
Caste distribution		
General (255)	71 (27.8)	184 (72.2)
SC, ST and OBC (145)	43 (29.7)	102 (70.3)
Total	114 (28.5)	286 (71.5)
Religion distribution		
Hindu (390)	109 (27.9)	281 (72.1)
Muslim (10)	5 (50.0)	5 (50.0)
Total	114 (28.5)	286 (71.5)
Occupational status		
Govt. Service (42)	14 (33.3)	28 (66.7)
Business (66)	18 (27.3)	48 (72.7)
House wife (176)	55 (31.3)	121 (68.7)
Farmer (12)	2 (16.7)	10 (83.3)
Others (104)	25 (24.0)	79 (76.0)
Total (400)	114 (28.5)	286 (71.5)

** ($p<0.01$) Pearson's chi square, value: 14.454[a], df: 3, asymp

Table 2: Comparison of the No. of drugs and daily dose frequency of medication in compliant and noncompliant

Variables (n)	Compliant (n = 114) N (%)	Noncompliant (n = 286) N (%)
No. of drugs/medication		
1 to 3/day (257)	81 (31.5)	176 (68.5)
More than 4/day (143)	33 (23.1)	110 (76.9)
Total (400)	114 (28.5)	286 (71.5)
No. of daily dose		
1 to 5/day (281)	86 (30.6)	195 (69.4)
6 and above/day (119)	28 (23.5)	91 (76.5)
Total (400)	114 (28.5)	286 (71.5)

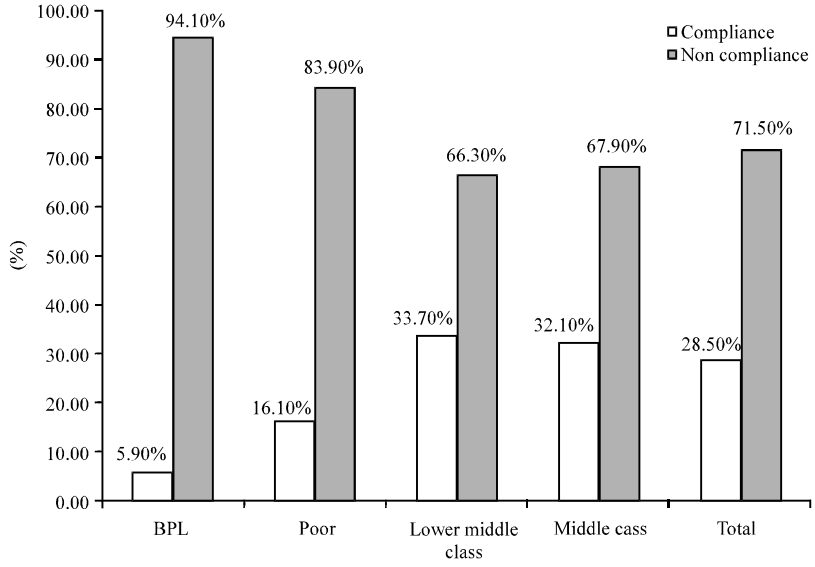

Fig. 1: Comparison of compliance and noncompliance among the patients of different socioeconomic group

DISCUSSION

This study provides important information about the prevalence of prescription medication noncompliance among the cardiac and diabetes patients from the state Tripura.

Diabetes and Cardiac problems are two chronic illnesses which require long term medication. Diabetes alone has taken 109000 lives during the year 2004 (Venkataraman *et al*., 2009) and cardiac problems are also progressively increasing and Noncompliance to prescribed regimen is a major factor affecting chronic illnesses.

In this study it was found that 71.5% were noncompliant and 28.5% patients were compliant to prescribed medication, which is comparable to other studies (Wertheimer and Santella, 2003; Cramer *et al*., 1989).

According to the study noncompliance rate showed no significant relation among the different age groups, educational qualification of the patients statistically.

The noncompliance rate was found to bear significant relationship with the socioeconomic condition of the patients ($p<0.01$) [Pearson's Chi Square, value =14.454[a], df = 3, asymp]. Majority of the noncompliant patients (67.5%) cited poor economic conditions as the main reason for discontinuation of medication, nonadherence to therapy which is comparable to other studies (Interactive, 2005; BW, 2006; Vimalavathini *et al*., 2008).

Table 3: Comparison of the different reasons of noncompliance among the noncompliant patients (n = 286) (Fig. 2)

Variables	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
R1	205	27	26	120	124	57	48	40	35	40	56	6
R2		36	12	21	21	15	32	5	9	9	6	1
R3			37	24	24	16	30	13	10	7	5	2
R4				190	189	75	43	47	39	42	33	6
R5					193	77	44	46	39	42	34	5
R6						88	29	23	23	18	16	2
R7							66	20	17	15	10	3
R8								59	41	29	16	2
R9									54	27	17	1
R10										54	20	3
R11											66	2
R12												8

Variables	Reasons of noncompliance	N (%)
R1	Forgetfulness	205 (71.7)
R2	Symptoms went away	36 (12.6)
R3	Drugs not effective	37 (12.9)
R4	Wanted to save money	190 (66.4)
R5	Failed to purchase due to economic reason	193 (67.5)
R6	Difficulty in getting the prescription filled	88 (30.8)
R7	Necessity not felt by patient	66 (23.1)
R8	Frightening side effects	59 (20.6)
R9	Drugs disabled daily works	54 (18.9)
R10	Unpleasant taste and smell of drug/Difficulty in swallowing	54 (18.9)
R11	Confusion due to many drugs (R11)	66 (23.1)
R12	No enough confidence on doctor	8 (2.8)

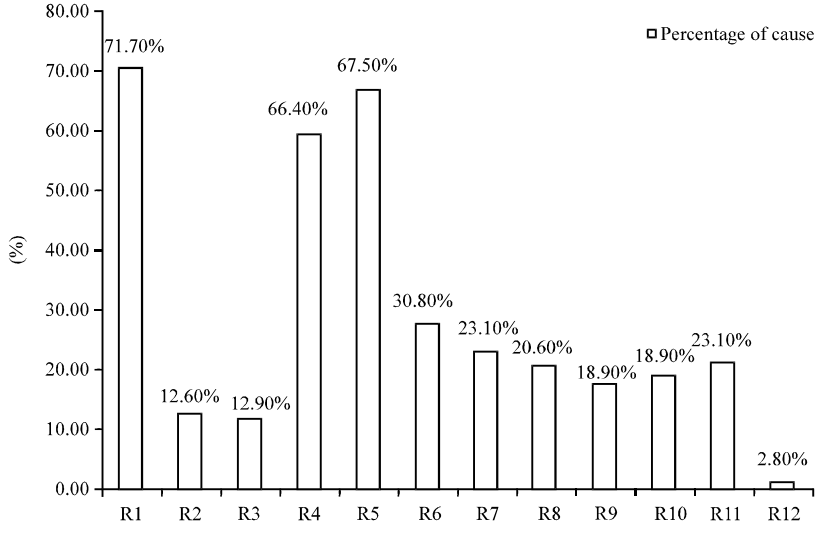

Fig. 2: Comparison of the reasons of noncompliance among noncompliant patient (n=286)

It has been found that patients receiving multiple drug regimens are showing more noncompliance, 76.9% noncompliance has been seen in patients receiving four or more medications per day. This shows that patients find it difficult to maintain multiple drug regimens. Studies have

been found which depicted multiple drug regimen as a complex one and likely for causing forgetfulness and thus nonadherence (Interactive, 2005; Leupkar, 1971; Schectman *et al*., 2002).

Among other causes of noncompliance, one is that, patients stop the drug on their own if they feel better and think they don't need the drug. Mostly seen in patients taking antihypertensive medication as they often don't feel any adverse physical effects (Leupkar, 1971).

Unavailability, difficult to purchase drug on their own, side effects to drugs and drugs that disable patients to do daily activities are also important reasons for discontinuation of therapy. Unpleasant taste, smell, dosage form has been also found to be responsible for noncompliance. Some patients showed noncompliance to the prescribed regimen or they stopped the drug as they had no enough confidence on the doctor. Similar factors responsible for noncompliance have also been cited in a study (Interactive, 2005).

There was no significant difference in the sex distribution, occupational status, educational status, religion or caste in compliant and noncompliant subjects and it is similar to a study (Yahya *et al*., 2006).

I order to better understand the results found, it is imperative to reproduce this study with larger samples and different characteristics. The results indicate the need of performing further studies that can also evaluate socio-cultural aspects, behaviour patterns, beliefs of patients relate to noncompliance.

The study can be confirmed with future studies which may include estimation of compliance rate before and after providing certain facilities to patients. For 'short term treatments' counseling, writing instructions about taking medicines, reminder packaging (e.g., calendar packs, dosettes) can be used. For 'long term treatments', supporting group discussions, simplification of regimens, reminders, cuing medications to daily events, reinforcements and rewards, involvement of family members and self monitoring with regular physician review may be important ways to ensure compliance.

In conclusion it may be recommended that drugs should be made available to the patients at affordable prices with simple dosing schedule and easily available drugs should be prescribed and unnecessary drugs should be avoided. Even though it is a complex matter, it is still crucial for health care providers to understand compliance triggers and variables. The cost of trauma is too great without compliance with therapy.

CONCLUSION

High degree of noncompliance has been found to be prevalent among the study population which may be one of the most important contributing factors for treatment failure or development of complications. Poor economic condition of the patient is the most important factor as identified in the study, for the existing problem of noncompliance in the state. Most of them find it difficult to purchase the drugs. Even if they purchase, they can't afford all the drugs. Either they stop the Drug or take the drug in fewer amounts so as to save money, leading to noncompliance. Forgetfulness has contributed to a large percentage in noncompliance causes.

So, the study shows that the main barrier that the patients have to face is with regards to the purchase of the drugs. Thus a better supply of drugs to the patients at affordable price is likely to improve the condition of medication compliance to prescribed regimen.

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