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Reasons for Non-Adherence in Bronchial Asthma

KEYWORDS: Non-compliance, Bronchial Asthma, Non-adherence

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ABSTRACT *In order to evaluate adherence to treatment and reasons for non-adherence in patients with Bronchial Asthma coming to a tertiary care hospital in Pune, a prospective study of 100 adult Asthma cases over a duration of 18 months with a follow-up period of 6 months was undertaken. There were 52 males and 48 females. 73% were non-adherent and 27% were adherent. Males (84.61%) were non-adherent as compared to females (60.41%), the most common reason being that they felt better on treatment and underestimated the severity of asthma (50.68%). Other reasons were forgetfulness/complacency toward treatment, distance of the hospital being too far, drugs being expensive, awkward regimes and side effects. 81.25% of the 88.09% patients who were diagnosed and put on treatment outside had wrong techniques. Adherence remains a major problem in the management of asthma. To improve adherence, there is a need for education of both patients and general practitioners.*

Introduction:
Asthma is a global health concern with millions of people affected worldwide. The prevalence of asthma in India is about 2% with a burden of about 17 million asthmatic patients (as cited in Agarwal et al., 2015). It affects individuals of all age groups (GINA 2015 Update) especially children. It leaves a social and economical burden on the general population in terms of reduced quality of life, number of days of school and work lost and increased health care costs (Adherence to long-term therapies. Evidence for action. Retrieved from url: http://www.who.int/chp/knowledge/publications/adherence_full_report.pdf?ua=1). Asthma if left uncontrolled can be fatal (GINA 2012 Update)

There is very limited data on asthma epidemiology from the developing world, including India (Aggarwal et al., 2006). In existing studies, factors like age, sex, socio-economic status, educational level and the presence of various addictions in relation to adherence were analyzed with conflicting results. Also not many studies probed into the specific reasons for non-adherence to treatment of Bronchial Asthma.

Hence, this study was undertaken to know the reasons for non-adherence with the hope that better adherence will lead to better outcome.

Subjects and Methods:
Study Design:
A prospective study was undertaken to evaluate the adherence to treatment in patients with Bronchial Asthma and the reasons for non-adherence. A total of 100 cases diagnosed to have bronchial asthma between October 2013 to April 2015 were included in the study. An informed, written, bilingual consent was obtained before starting the study.

Selection of Subjects:
Inclusion Criteria:
All cases of Bronchial Asthma coming to our hospital previously diagnosed outside or diagnosed on arrival irrespective of their treatment status.

Exclusion Criteria:
Pediatric cases (below the age of 18 years).

Alternate causes of recurrent wheeze. These included:

- Chronic Rhino-Sinusitis
- Gastro Esophageal Reflux
- Recurrent Viral Lower Respiratory Tract Infections
- Foreign Body Aspiration
- Immune Deficiency
- Congenital Heart Disease
- Vocal Cord Dysfunction
- Other forms of Obstructive Lung Disease, particularly COPD
- Non-Obstructive forms of Lung Disease (e.g. Diffuse Parenchymal Lung Disease)
- Non-Respiratory causes of symptoms (e.g. Left Ventricular Failure)

Patients who were unable or unwilling to come for follow-up.

Methodology of Study:
100 cases of Bronchial Asthma who were previously diagnosed outside or diagnosed on arrival to our hospital were included in this study.

The duration of this study was 18 months from October 2013 to April 2015.

Collection of data for this study was started after the ap-

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proval of the Ethics Committee.

All patients were given an idea about this study and an informed consent was obtained.

A good rapport was developed with all the patients and the detailed information which was required for this study was obtained from the patients with the help of proformas and questionnaires as per the Global Initiatives for Asthma (GINA 2012 Update).

Every patient was followed up during their course of treatment for a period of six months.

Analysis of Data:
The type of data was quantitative and qualitative. The information collected from the patients was summarized into tables and graphs and the collected data were analyzed. The help of a statistician was taken whenever required. Tests of significance i.e. the Chi-square test and the Fisher's exact test, were used wherever applicable.

Results:
This study was performed to evaluate the adherence to treatment of bronchial asthma and to elicit the reasons for their non-adherence. Patients who were non-adherent to treatment were put forward questionnaires regarding their reasons for non-adherence. Patients who failed to follow up were contacted via telephone and the same questionnaire was used.

It was found that 27% patients were adherent to the prescribed treatment and 73% patients were non-adherent. Table 1 depicts the distribution of patients according to sex. p-value is 0.006 (<0.05) which is significant (Chi-square test was used). Table 2 depicts the distribution of the patients according to age group.

It was also noted that out of the total number of patients included in the study, 81 belonged to the urban sector and 19 to the rural sector. Out of the urban population, 23 (28.39%) patients were adherent to treatment and 58 (71.6%) were not adherent. The rural sector did not show much difference in the adherence as compared to the urban sector. Out of the 19 patients in the rural sector, only 4 (21.05%) were compliant to the treatment, and the remaining 15 (78.94%) were non-compliant. p-value was 0.516 (>0.05) which was not significant.

To analyze the relation of socioeconomic status of the patients with adherence to treatment, it was noted that all the patients in this study fell into the Upper, Upper Middle and Lower Middle classes of the Modified Kuppuswamy's scale. Out of the 24 patients that were in the upper class category, 6 (25%) patients were adherent to the treatment and 18 (75%) patients were not adherent to the given treatment; out of the 49 patients that belonged to the upper middle class category, 13 (26.53%) patients were adherent and the remaining 36 (73.46%) were non-adherent; out of the 27 patients that fell into the lower middle class strata, 8 (29.63%) patients were compliant to the treatment and 19 (70.37%) patients were non-compliant. There were no patients who fell in the upper lower and lower strata of the modified Kuppuswamy's scale. p-value was 0.928 (>0.05). Result was not significant.

Table 3 compares the level of education and the rates of adherence. p-value was 0.167 (>0.05) which was not significant.

In this study population, it has been noted that 34 patients were either addicted to alcohol or tobacco (smoked or chewed). Out of the 34, only 1 (2.94%) patient was adherent to the given treatment. This patient was a smoker. The rest 33 (97.06%) patients were non-adherent. It has also been depicted that out of the 66 patients who did not have any substance abuse, 26 (39.4%) patients were compliant and 40 (60.61%) patients were non-compliant.
p-value is <0.001 (<0.05) which is significant.

Distance of commute between the hospital and the patients' residences did not play a major role in adherence to treatment in our study. p-value was 0.628 (>0.05). It was noted that out of the 76 patients that live in a radius up to 9 kms from the hospital, 20 (26.32%) of them were adherent to treatment, whereas 56 (73.69%) of them were non-adherent. There were a total of 6 patients that lived in the radius of 10-29 kms from the hospital. Out of which, 3 (50%) patients were adherent and 3 (50%) patients were non-adherent. Only 1 patient lived in the range of 30-49 kms from the hospital, and he had not adhered to the given treatment. In the radius of ≥50 kms, there were 17 patients in total. 4 patients (23.52%) patients were adherent and 13 (76.47%) patients were not adherent to treatment.

In this study, daily expenditure borne by the patient in commuting between the hospital and their residences also did not play a significant role in adherence to treatment. p-value calculated was 0.619 (>0.05). There were a total of 60 patients who had their own means of commute and hence no expenditure. Out of these 60, 16 (26.67%) patients were adherent to treatment whereas 44 (73.33%) patients were non-adherent. In the daily expenditure range of Rs. 1-50, there were a total of 19 patients. 5 (26.31%) patients were adherent and 14 (73.68%) patients were not adherent to the given treatment. Only 7 patients fell into the category of the daily expenditure range of Rs. 51-100. Out of which 2 (28.57%) patients were compliant with the given treatment and 5 (71.43%) patients were not compliant. In the category of Rs. 101-150 as the daily expenditure range, there were a total of 11 patients, in which 2 (18.18%) patients were adherent to their treatment, and 9 (81.82%) patients were not adherent. There were 3 patients who spent >Rs.150 daily for commuting to our hospital. 2 (66.67%) patients were adherent to treatment and 1 (33.33%) were not adherent to the given treatment.

Discussion:
A prospective study was undertaken in a tertiary care hospital, Pune to evaluate the adherence to treatment in patients with bronchial asthma and the reasons for non-adherence.

Adherence rates:
In this study, it has been observed that 27% of the patients were adherent to the treatment prescribed for bronchial asthma and 73% patients were non-adherent. International literature suggests that only 50% patients were adherent to treatment whereas Indian literature states a non-adherence rate of more than 60% as evident by studies conducted by Gillissen A et al. (2007), Rifaat N et al. (2013) and Gaude et al. (2014).

Asthma adherence in relation to sex:
It has been noted in this study that females (39.58%) were more adherent to therapy than males (15.38%) which was statistically significant (p value <0.006). This was also found in a study by Sundberg R et al. (2010). in which 57.3% females were adherent as compared to 46.2% males being

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adherent. Gaude GS (2011) in another study demonstrated that 56.6% males were not adherent to treatment as compared to 43.3% females. However in a study by Rifaat N et al. (2013) it was found that there was no correlation between adherence and sex and the test was not significant.

Adherence rates in relation to age:
In this study, it was found out there was not much correlation between adherence and age of the patients. However it was noted that middle aged and elderly patients had lower adherence rates. The test was not statistically significant. In the studies by Rifaat N et al. (2013) and Haskard KB et al. (2008) it was found that older patients were more adherent with their treatment. In a study by Tavasoli S et al. (2006) it was found that there was no correlation between compliance and age.

Demographic status and adherence:
In this study it was noted that the demographic status played no significant role in the adherence to treatment prescribed. Rifaat N et al. (2013) also found that there was no significance when it came to the demographic status (urban or rural population) and adherence to treatment.

Adherence rates in relation to socioeconomic status:
In the current study, it was observed that there was no correlation between treatment adherence and socioeconomic status. In a study by Tavasoli S et al. (2006) it was seen that there was no correlation between employment status and compliance. However, in a study conducted by Gaude et al. (2014) it was found that socioeconomic status played a major role in adherence to the treatment.

Adherence rates in relation to educational status:
In this study, it has been observed that graduates and post graduates had a higher level of non-adherence (83.33% and 73.68%, respectively) to the prescribed treatment. Patients who had completed their education till primary (100%) and secondary (76.47%) school also had high levels of non-adherence. The observations were however not significant. This was in sharp contrast to other studies like that of Gaude et al. (2014) in which he found that higher education (post graduation) had 100% compliance. Graduates had 78% compliance, patients with secondary education had a default rate of 60%, those with primary education a higher default rate of 71.4% and illiterates had a default rate of 100%. This sharp contrast was probably due to the fact that the educated patients had busy work schedules and even twice daily regimens were not suitable for them. Also when they felt better, they reduced and stopped their treatment altogether without the consultation of a physician (intelligent non-adherence). The uneducated patients had more trust in the physicians' advice. In a study by Tavasoli S et al. (2006) it was observed that the patients' literacy level had a positive outcome on the compliance to treatment. However, in a study by Rifaat N et al. (2013) it was observed that educational status did not play much of a role in the adherence to treatment. They found out that 48.4% patients with a university degree were non-adherent and 51.6% patients were adherent to treatment (p value 0.66).

Addictions and adherence to treatment:
In the current study it was found that patients having some sort of substance abuse had more chances of defaulting from their given treatment. Only 2.94% patients with substance abuse were adherent to the prescribed treatment for bronchial asthma. In a study by Haskard KB et al. (2008) it was observed that binge drinking and being a smoker affected adherence rates. Binge drinking significantly predicted medication non-adherence among California adults with symptomatic asthma (OR = .63, 95% CI = .45-.89). Being a current smoker also predicted non-adherence (OR<1, p <0.05).

Specific reasons for non-adherence:
There are not many studies depicting the specific reasons for non-adherence to treatment of bronchial asthma. Findings of our study as compared with few other studies are summarized in the table below:

Other reasons elicited in this study were:

- Had side effects to the given drugs (1.36%)
- Distance of commute between the hospital and place of residence being too far (19.17%)
- Steroid phobia (2.74%)
- Misunderstood technique (28.76%)
- Inappropriate expectations (1.36%)
- Cultural and social issues like family support (2.74%)
- Religious issues (2.74%)
- Discontinued treatment/ follow up as they wanted to return back to their native place (2.74%)

Other reasons elicited in other studies were:

- Ill-attitude towards health condition. Gaude et al. (2014) (8%), Gaude GS (2011) (8%)
- Distant pharmacies. Gaude et al. (2014) (5%), Gaude GS (2011) (5%)
- No appreciable result from taking medication. Apter AJ et al. (1998) (6%)
- Influenced by wrong advice by relatives or friends. Panicker R et al. (2012) (73%)
- Believed that tablets were less dangerous than inhalers. Panicker R et al. (2012) (51.6%)

Conclusion:
The rate of non-adherence in our study was 73% which was much higher than other Indian studies. The reasons were multi-factorial. Females (39.58%) were more adherent. People who had substance abuse also tended to become non-adherent (97.05%). From the above, it is clear that adherence remains a common problem in asthma management. There is a need for more Indian studies with a larger sample size to identify reasons for non-adherence, which will help in better outcome while managing asthma patients.

Table 1: Distribution of patients according to sex

	ADHERENT	%	NON-ADHERENT	%	TOTAL
MALE	8	15.38	44	84.61	52
FEMALE	19	39.58	29	60.41	48
TOTAL	27	27	73	73	100

Table 2: Distribution of patients according to age group

AGE GROUP	ADHERENT	%	NON-ADHERENT	%	TOTAL
18-30	9	22.5	31	77.5	40
31-40	12	37.5	20	62.5	32
41-50	5	31.25	11	68.75	16
51-60	0	0	3	100	3
>60	1	11.11	8	88.89	9
TOTAL	27	27	73	73	100

p-value was 0.410 (>0.05)

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Table 3: Level of education and adherence

EDUCATIONAL STATUS	ADHERENT	%	NON-ADHERENT	%	TOTAL
ILLITERATE	7	43.75	9	56.25	16
PRIMARY	0	0	7	100	7
SECONDARY	4	23.52	13	76.47	17
HIGHER SECONDARY	7	41.18	10	58.82	17
GRADUATE	4	16.67	20	83.33	24
POST GRADUATE	5	26.32	14	73.68	19
TOTAL	27	27	73	73	100

Table 4: Specific Reasons for Non-Compliance#

REASONS	NO. OF PATIENTS	PERCENTAGE
Felt better	65	89.04
Underestimated the severity	60	82.19
Misunderstand technique	21	28.76
Forgetfulness/ complacent	16	21.92
Distance too far	14	19.17
Difficulty in using the device	12	16.43
Treatment expensive	8	10.95
Fear of side effects	3	4.11
Awkward regime	3	4.11
Disliked the medication	3	4.11
Steroid phobia	2	2.74
Cultural issues	2	2.74
Religious issues	2	2.74
Have side effects	1	1.36
Inappropriate expectations	1	1.36
Angry about illness	1	1.36
Others*	2	2.74

Many patients had more than one reason for non-compliance

*Others were patients who wanted to discontinue follow up as they wanted to return back to their native place

Table 5: Various studies demonstrating specific reasons for non-adherence

REASONS FOR NON-ADHERENCE	CURRENT STUDY (%)	OTHER STUDIES (%)
Fear about side-effects	4.11	Gaude et al[8] (18) Gaude GS[10] (18) Panicker R et al[13] (82)
Feeling Better	89.04	Gaude et al[8] (13) Gaude GS[10] (13)
Underestimate severity of the condition	82.19	Gaude et al[8] (12) Gaude GS[10] (12) Panicker R et al[13] (52) Apter AJ et al[14] (12)
Forgetfulness/Complacency	21.92	Gaude et al[8] (10) Gaude GS[10] (10) Apter AJ et al[14] (40)
Angry about the condition	1.36	Gaude et al[8] (6) Gaude GS[10] (16)
Cost of therapy	10.95	Gaude et al[8] (12) Gaude GS[10] (12)
Difficulty with inhaler devices	16.43	Gaude et al[8] (12) Gaude GS[10] (12) Apter AJ et al[14] (4)
Awkward regimes	4.11	Gaude et al[8] (6) Gaude GS[10] (6) Apter AJ et al[14] (30)
Dislike for medications	4.11	Gaude et al[8] (6) Gaude GS[10] (6)

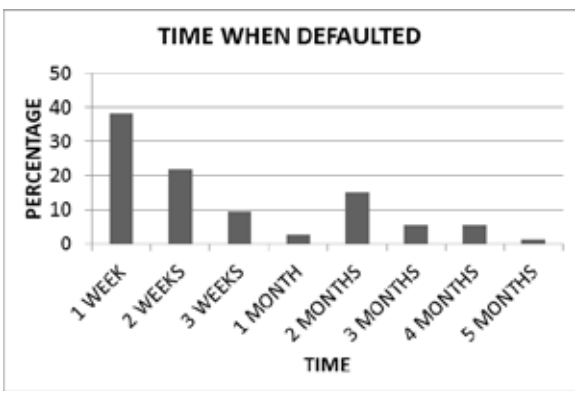

Figure 1: Time when defaulted

References:

1. Adherence to long-term therapies. Evidence for action. Available from url: http://www.who.int/chp/knowledge/publications/adherence_full_report.pdf?ua=1.
2. Agarwal R, Dhooria S, Aggarwal AN, Maturu VN, Sehgal IS, Muthu V, *et al*. Guidelines for diagnosis and management of bronchial asthma: Joint ICS/NCCP (I) recommendations. Lung India 2015;32:3-42.
3. Aggarwal AN, Chaudhry K, Chhabra SK, D'Souza GA, Gupta D, Jindal SK, Katiyar SK, Kumar R, Shah B and Vijayan VK. Prevalence and Risk Factors for Bronchial Asthma in Indian Adults: A Multicentre Study for Asthma Epidemiology Study Group. The Indian Journal of Chest Diseases & Allied Sciences 2006;48:13-14.
4. Apter AJ, Reisine ST, Affleck G, Barrows E, ZuWallack RL. Adherence with twice-daily dosing of inhaled steroids. Socioeconomic and health-belief differences. Am J Respir Crit Care Med 1998;157:1810-7.
5. Gaude G, Hattiholi J, Chaudhury A. Poor Compliance to Inhaler Therapy in Bronchial Asthma Patients –A Prospective Study in General Population. Sci J Clin Med Vol. 3, No. 1, 2014, pp. 4-9. doi: 10.11648/j.sjcm.20140301.12.
6. Gaude GS. Factors Affecting Non-adherence in Bronchial Asthma and Impact of Health Education. Indian J Allergy Asthma Immunol 2011; 25(1) : 1-8.
7. Gillissen A, Büsch K, Juergens U. [Adherence to therapy in bronchial asthma]. [Article in German]. Dtsch Med Wochenschr. 2007 Jun 8;132(23):1281-6.
8. Global Initiatives for Asthma. Global Strategy for Asthma Management and Prevention 2012 (Update). Available from http://www.ginasthma.org.
9. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention 2015 (Update). Available from http://www.ginasthma.org.
10. Haskard KB, Banta JE, Williams SL, Haviland MG, DiMatteo MR, Przekop P, et al. Binge drinking, poor mental health, and adherence to treatment among California adults with asthma. J Asthma. 2008 Jun;45(5):369-76.

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11. Panicker R, Arifhodzic N, Al-Ahmed M, Huda S. Perceptions and factors affecting poor adherence to inhaled steroids among bronchial asthma patients in Kuwait. European Respiratory Journal Sep 2012;40(Suppl 56).
12. Rifaat N, Abdel-Hady E, Hasan AA. The golden factor in adherence to inhaled corticosteroids in asthma patients. EJCT. 2013;62:371-6.
13. Sundberg R, Torén K, Franklin KA, Gislason T, Omenaas E, Svanes C, et al. Asthma in men and women: treatment adherence, anxiety, and quality of sleep. Respir Med. 2010 Mar;104(3):337-44.
14. Tavasoli S, Heidarnazhad H, Kazemnejad A. Factors affecting patients' compliance to metered-dose inhaler drugs in two asthma clinics in Tehran, Iran. Iran J Allergy Asthma Immunol Dec. 2006;5(4):187-193.