

Factors Associated with Asthma Patients Dropping Out from Outpatient Clinic Follow-up

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Asthma requires long-term self-management with regular physician support and surveillance. However, most studies of patients who drop out from treatment or follow-up of their condition have focused on psychiatric and pediatric patients, and there have been relatively few studies on patients with asthma. Patients who drop out may not receive adequate medical care, and place themselves at risk of unnecessary morbidity and mortality. The purpose of this study was to determine the percentage of asthma patients who drop out during follow-up, and the reasons and predictive factors for this dropping out. The medical records of 168 patients with asthma, who had attended a chest special clinic from 1989 to 2002 at our hospital, were analyzed. A telephone survey was performed to determine the reasons for dropping out. The overall dropout rate was 58.9% of the 168 patients attending the clinic during the study period, and a high percentage (46.5%) of these drop-outs occurred during the first 6 months. The three most common reasons for dropping out were symptom improvement, inconvenient consultation, and patient decision to use other hospitals. The predictive factors for dropout were female gender and the presence of coexisting chronic diseases. According to the patient-generated complaints, some strategies to ensure patient education, and intervention to ease the inconvenience of follow-up, might be helpful. Early detection and intervention for patients at high risk of dropout might improve the management efficiency of patients with asthma. (*Thorac Med* 2003; 18: 474-480)

Key words: Asthma, Dropping out, outpatient clinic

Introduction

Patients who do not attend scheduled appointments, commonly called “non-attendance” or “drop-out” patients, represent important problems in many medical outpatient clinics. Previous studies have reported dropout rates in the range of 3 to 42% [1-10]. There is concern that patients who drop out from scheduled follow-up may not receive adequate

medical care, and may suffer from unnecessary morbidity and mortality. Missed appointments also reduce the efficiency of medical care. Previous research on dropouts has focused mostly on the problems of psychiatric and pediatric patients [1], and relatively few studies have been carried out with patients with medically chronic diseases, such as hypertension [5-6] and asthma [11].

Asthma, one of the most commonly encoun-

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tered diseases in outpatient clinics, is a chronic inflammatory disorder of the airways with recurrent exacerbation, which requires long-term care. The prevalence of asthma has considerably increased over the last two decades and imposes a substantial burden on patients, their families and society. Surprisingly, a literature review of the past 25 years revealed few studies on the problem of patient dropout during treatment at asthma clinics [11]. Woodward's study at a nurse-run asthma clinic found that the reasons for the high dropout rate of 52.6% were multifactorial. However, no independent factor predictive of dropout was found.

The purpose of this study was to determine the dropout rate of patients with asthma at a special chest clinic, the reason that they were lost to follow-up, and the factors associated with dropping out. Early detection of asthma patients at high risk of dropping out might improve the efficiency of health care by enabling health professionals to provide targeted interventions aimed at the patient-generated complaints.

Patients and Methods

Subjects

From January 1989 to Oct 2002, the appointment records of 175 subjects with asthma, aged at least 15 years old, who had attended a special chest clinic at the National Cheng Kung University Hospital, a tertiary referral medical center in southern Taiwan, were investigated. A total of 168 of these subjects were eventually included in the study, and their appointment records were investigated retrospectively. Six subjects were excluded due to death, and one patient was excluded due to adequate control of asthma, which was defined as no attack during an outpatient clinic follow-up period longer than one year.

Subjects who had not attended scheduled appointments for 6 months or more were defined as the dropout group. Subjects in the dropout group were contacted by telephone survey to investigate the reasons for non-attendance. Subjects were asked to consider 12 possible reasons for dropping out,

and were allowed to choose any number of these reasons and given the chance to indicate additional reasons. Attempts were made to contact subjects in the dropout group at different times, and on different days if the initial attempt at contact was unsuccessful. A non-responding subject was defined as a subject who could not be contacted during at least 10 attempts.

The clinical variables recorded at the initial clinic visit included age, gender, pulmonary function test, family history, and the presence of coexisting chronic diseases (hypertension, diabetics, chronic liver disease, and chronic renal insufficiency). The variables recorded at the last clinic visit included the number of oral medications and the number of different inhalation devices (meter-dose-inhaler, turbuhaler and accuhaler) prescribed. Spirometry and lung volumes (helium dilution method) were performed with a rolling seal spirometer, following the standard methods suggested by the American Thoracic Society [12].

Data analysis

The data gathered in this research were analyzed using SPSS 10.0 for Windows. Analytical methods used included descriptive statistics: percentage and average; and inferential statistics: t-test, chi-square test, and linear regression. The significant level was set at a p value less than 0.05.

Results

The 168 subjects recruited for participation in the study included 84 males (50%) and 84 females (50%). The mean age of the subjects at the time of their initial clinic visit was 44.52 years old (44.52 ± 16.16) (Table 1 and Table 2).

There were 99 subjects who met the criteria for classification as dropouts. Sixty-nine subjects who completed follow-up were included as the attendance group. Therefore, the dropout rate in this series of patients was 58.93%. Among the subjects in the dropout group, 34 could not be reached: 9 subjects had no current telephone number, 2 had unlisted numbers and 15 had incorrect telephone

Table 1. Demographic and clinical data of all subjects (numerical variables) (N=168)

Numerical variables	Mean	SD
Age at first OPD visit (yr)	44.52	16.16
Duration of follow-up (months)	41.29	43.18
Number of times of follow-up	30.22	32.90
FEV ₁ (L/sec)	1.93	0.77
FEV ₁ % predicted	67.17	20.42
FEV ₁ /FVC, %	64.38	15.17
Number of oral medications	4.64	2.06

FVC: forced vital capacity

FEV₁: forced expiratory volume in one second

numbers on their charts, 7 were non-responders, and one had died. The expired subject had died after a 6-month absence from scheduled appointments, and the family would not reveal the cause of his death, so we still assigned him to the dropout group. Forty-six percent of subjects in the dropout group were lost to follow-up within 6 months of the first visit. The demographic and clinical data of the two groups are shown in Table 3.

Sixty-five of the 99 subjects contacted completed the telephone interview. Thirty-nine subjects (60.0%) indicated one reason, 20 subjects (30.77%) two reasons, and 6 subjects (9.23%) indicated three reasons for dropping out. The most common reason for dropout was symptom improvement (64.6%), followed by inconvenient consultation (33.8%), the decision by the subject to use another hospital (24.6%), and fear of medication side effects (7.7%). The reasons for dropping out are shown in Table 4.

There were significant differences between the dropout group and the attendance group in gender, age at the time of the first OPD visit for treatment of asthma, duration of follow-up, number of times of follow-up, pulmonary function test, and presence of coexisting chronic diseases (Table 5). There were significantly more female ($p < 0.01$) and younger ($p = 0.001$) subjects in the dropout group than in the attendance group. The presence of coexisting chronic diseases was more common in the attendance group ($p < 0.001$). Subjects in the dropout group had better initial pulmonary function

Table 2. Demographic and clinical data of all patients (categorical variables) (N=168)

Categorical variables	N	%
Gender		
Male	84	50
Female	84	50
Coexisting chronic disease		
No	114	67.9
Yes	54	32.1
Number of different inhalation devices		
0	2	1.2
1	30	17.9
2	126	75
3	10	6

test results ($p = 0.023$). Family history, number of different inhalation devices, and number of oral medications were similar in the two groups.

Statistical analysis showed that gender, age, pulmonary function test results, and the presence of coexisting chronic diseases were significantly correlated with dropping out. Using dropout as a dependent variable in linear regression, gender and the presence of coexisting chronic disease explained 11.5% of the variance in the stepwise regression model.

Discussion

The chronicity and increased prevalence of asthma require that patients become active partners with health professionals in the regular follow-up, surveillance, and treatment of their condition. Unfortunately, patients with asthma are prone to lapse in compliance or even drop out when the condition is mild or asymptomatic [13]. Nevertheless, the consequences of stopping treatment may be delayed. This study was designed to determine the dropout rate in asthma clinics, the reasons, and the factors predictive of dropout, in order to improve the management of patients with asthma.

The results showed that 99 out of 168 patients with asthma dropped out of scheduled follow up,

Table 3. Comparison of clinical characteristics of the dropout group and the attendance group

Variables	Dropout group	Attendance group	Statistical value	P value
Age at first OPD visit (yr)	41.17±16.08	49.33±15.15	t=-3.31	0.001
Duration of follow-up (months)	21.00±27.06	70.39±45.44	t=-8.08	< 0.001
Number of times of follow-up	16.74±20.45	49.57±37.56	t=-6.61	< 0.001
FEV ₁ (L/sec)	2.03±0.79	1.78±0.71	t=2.17	0.032
FEV ₁ % predicted	70.17±19.61	62.91±20.93	t=2.29	0.023
FEV ₁ /FVC, %	66.04±14.82	62.01±15.45	t=1.70	0.091
Number of oral medications	4.39±2.04	4.99±2.06	$\chi^2=10.16$	0.426
Number of different inhalation devices			$\chi^2=4.888$	0.180
0	1(50%)	1(50%)		
1	23(23.2%)	7(10.1%)		
2	70(70.7%)	56(81.2%)		
3	5(50%)	5(50%)		
Gender			$\chi^2=7.11$	0.008
Male	41(41.4%)	43(62.3%)		
Female	58(58.6%)	26(37.7%)		
Coexisting chronic diseases			$\chi^2=15.76$	0.000
No	79(79.80%)	35(50.72%)		
Yes	20(20.20%)	34(49.28%)		
Family history			$\chi^2=3.345$	0.067
Negative	73(73.7%)	59(85.5%)		
Positive	26(26.3%)	10(14.5%)		

FVC: forced vital capacity

FEV₁: forced expiratory volume in one second**Table 4.** Reasons for dropping out (n=65)

Reasons	Count	% Of cases
Symptom improvement	42	64.6
Inconvenient consultation		
Hospital factor	8	12.3
Patient factor	14	21.5
Fear of drug side effects	5	7.7
Patient decision to use another clinic	16	24.6
Financial constraints	1	1.5
Control of symptoms with herbs	4	6.2
Poor response to treatment	3	4.6
Medication side effects	3	4.6
Dr/staff problem	1	1.5
Total responses	97	149.2

Multiple answers were allowed

Inconvenient consultation (hospital factor): waiting too long, difficult to register

Inconvenient consultation (patient factor): moved, too busy, too far

Table 5. Stepwise linear regression of the dropout rate (N=168) with gender and coexisting chronic disease

Variables	B value	Beta	R ²	F value
Coexisting chronic disease	.292	.277	.115	10.665*
Gender	-.151	-.153		
Constant	1.545			

* p < 0.001

representing a dropout rate of 58.9%. This result is similar to that of a study by Woodward, in which a dropout rate of 52.6% was reported [11]. Studies of other chronic diseases have reported dropout rates between 3 and 42% [1-10], which is much less than in the present study. This suggests that many patients with asthma lack adequate medical care, and deserve more attention from professionals.

In this study, a high percentage of dropouts (46.5%) occurred within 6 months of the first visit. Similar findings have been reported in patients receiving care at diabetic clinics, with dropout rates of 33% and 54.5% within 6 months from the first attendance [14-15]. These findings suggest the need for comprehensive patient education in the first 6 months of clinic attendance for those patients who are at high risk of dropping out.

This study found that the reasons for dropping out were multifactorial. The predominant reason was symptom improvement, followed by inconvenient consultation. This result is somewhat different from the findings of Woodward [11], in which forgetting, difficulty getting time off work, and considering the visits not necessary were reported as the main reasons for dropping out. One possible explanation for this discrepancy is that Asian subjects may have a greater desire to rationalize their behaviors rather than admitting their own forgetfulness.

Because the reasons for dropping out vary widely, successful interventions may need to address a variety of factors and be tailored to the individual patient. Potentially helpful interaction between patients and healthcare providers should include educational efforts regarding the disease and the importance of continuing care. In addition, health professionals could provide alternatives to patients which might increase compliance, such as discussing convenient times for clinical visits, checking that the registration number of the patient who is just visiting the doctor in the clinics on the website before visiting the hospital, or referring some patients to nearby clinics, and discussing potential financial problems.

In this study, we excluded the variables of duration and number of follow-up visits because they are confounding variables to the factors associated with dropping out. There were significant differences between the dropout group and the attendance group in gender, age at the time of the first OPD visit, initial pulmonary function test results, and presence of coexisting chronic diseases. Although these variables may have affected the vari-

ance in the assessment of the dropout rate, their statistical significance partly disappeared in the stepwise analysis.

Stepwise analysis indicated that female gender and presence of coexisting chronic disease were the most predictive variables for dropping out. Degoulet *et al.* similarly had found that there was a lower dropout rate in patients with hypertension if they had a coexisting disease such as asthma or stroke [6]. The effect of gender on the dropout rate has varied among patients with different diseases [1-4, 6-9, 11, 13, 16]. Female gender was significantly associated with dropping out in this study. This result may be explained by the fact that the average age of female subjects in this study was 40 years old. Women of this age in Taiwan are often faced with heavy family responsibilities, which may increase their tendency to drop out from follow-up at asthma clinics.

In conclusion, a high percentage of patients with asthma drop out from follow-up at outpatient clinics, indicating that their asthma management is far from satisfactory. These data suggest the need for strategies to increase the attendance rate. The high percentage (46.5%) of dropouts during the first 6 months in this study indicates the importance of intervention to prevent dropping out during this period. Previous studies have found that intervention aimed toward patient-generated complaints was useful in reducing the dropout rate [5]. This suggests that the reinforcement of comprehensive education programs and strategies to reduce waiting time, such as informing patients about the timing of visits or checking the registration number of patients that has been assessed on the website, may improve the attendance rate. Recognizing patients who are at high risk of dropping out as early as the first visit may have important practical consequences. Awareness of factors affecting the dropout rate should help focus the attention of physicians toward this problem, and help in changing their approach to patients, which might result in improved care. Although not modifiable, female gender and the presence of coexisting chronic diseases were the most predictive factors of dropping out. This

may have been due to the nature of the subjects attending our clinic. Further research is needed in various settings to extend our understanding of the risk factors for dropping out from follow-up among asthma patients treated at outpatient clinics. In addition, more research is needed into the morbidity and mortality levels among the dropout patients.

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門診氣喘病人中輟原因之探討

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氣喘病人的照顧，需要病人本身的自我照顧以及規則地由醫師追蹤監測。然而，關於病人自行中輟門診追蹤的研究報告，大都集中在精神科及兒科，僅有少數報告針對氣喘病人。這些自行中輟門診追蹤的病人，可能無法接受必須的醫療照顧並承受一些原先可避免的發病以及死亡。這篇研究的目的即是在探討門診氣喘病人的中輟率、原因以及預測因子。所以我們回顧研究 168 位從 1978 至 2002 年間，曾在本院某一固定胸腔科門診治療過的氣喘病人的病歷資料。並對自行中輟之病人以電話訪談的方式，了解其中輟原因。結果顯示中輟率為 58.9%，且有相當高比率 (46.5%) 的病人是在前六個月中輟追蹤。中輟最常見的三個原因分別是症狀改善、看診不便以及轉至其他醫院追蹤。中輟的預測因子為女性及同時有其他慢性病存在。我們相信針對病人所提出的原因，來對應施行的改善方案，如加強衛教及提供一些避免看診不便的方法是有用的。而早期辨識出可能中輟的病人應可以降低中輟率增進對氣喘病人的照護。(胸腔醫學 2003; 18: 474-480)

關鍵詞：氣喘，中輟，門診

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