

Once-Per-Day Inhaled Corticosteroids: A Method to Improve Compliance and Asthma Control

Authors J. L. Jarry, PhD; R. B. Coombs, PhD; A. H. Rattray; F. G. De Maio, BA (Hons); A. Santhiapillai, PhD
Affiliation Health Promotion Research, Inc, Toronto, Ontario, Canada

ABSTRACT

Background: Inhaled corticosteroids (ICS) are considered the first-line anti-inflammatory treatment for asthma. However, compliance with ICS is poor, grows worse over treatment duration, and is generally overestimated by patients and physicians. Previous research has demonstrated that simplifying the treatment regimen usually improves compliance. This study investigated the expected compliance improvement from once-per-day ICS treatment.

Methods: Study 1 was a representative mail survey of a stratified random sample of 127 Canadian general practitioners and family physicians (69% response rate). Study 2 was a telephone survey of 224 Canadian patients with asthma on ICS therapy.

Results: Physician self-reported ICS prescribing practices deviated from Canadian asthma control guidelines, and ICS tended to be underprescribed. Physicians estimated that once-daily ICS would improve compliance by 34% compared with current ICS therapies having a multidose daily regimen. Patients reported their noncompliance was high, and only 16% met Canadian criteria of asthma control. Eighty-seven percent of patients reported preferring once-daily dosing, and 66% expressed that their compliance would improve with this dosage regimen. Multivariate modelling showed that poor current compliance predicted a preference for a once-daily ICS.

Conclusion: Once-daily ICS treatment in Canada is seen by both patients and physicians as a means to improve compliance and asthma control.

Introduction

- Compliance with inhaled corticosteroid (ICS) therapy is poor.¹⁻²¹
- Compliance with twice-daily ICS is better than compliance with ICS 4 times daily.²²
- Research in other chronic illnesses has shown that once-daily formulations improve compliance and therapeutic coverage.²³⁻³⁵
- Compliance of patients with asthma would likely improve with a once-daily formulation.
- Patient access to once-daily ICS will depend on physicians' readiness to prescribe this formulation.
- The goal of these studies was to assess physicians' and patients' perceptions of the compliance advantages of once-daily ICS.

Methods

- Study 1 was a representative mail/fax/telephone survey of a stratified random sample of 250 Canadian primary care physicians.
- Study 2 was a telephone survey of 224 Canadian patients with asthma on ICS therapy.

Results

Physician Survey

- Of the 250 physicians randomly selected from a database of all Canadian general practitioners and family physicians (N = 26,714), 183 met the inclusion criteria for this study.
- The final sample of 127 physicians represents a 69% response rate among those who were eligible.
- The physicians' province of practice, their language, and their gender distribution were adequately representative of Canadian physicians.³⁶
- ICS tended to be underprescribed, with 59.3% of patients with mild asthma and 10.6% of patients with moderate asthma receiving only a short-acting bronchodilator.
- Physicians felt that 34% more patients would be compliant with a once-daily ICS treatment regimen, compared with current therapies of 2 or more doses per day.
- Most were favourable towards prescribing a once-daily ICS for mild to moderate, and for severe asthma (Figure 1).
- Significantly more physicians felt that a once-daily ICS could be as efficacious as a twice-daily ICS for mild to moderate, than for severe asthma ($t_{(118)} = 7.58, P < .001$; Figure 1).
- Physicians felt that highly noncompliant patients with severe asthma would benefit significantly more from a once-daily ICS than highly noncompliant patients with mild to moderate asthma ($t_{(119)} = 3.55, P < .001$; Figure 1).
- A stepwise multiple regression with 13 potentially relevant predictors retained only the extent of belief in the efficacy of once-daily ICS for the treatment of mild to moderate asthma as a significant predictor of readiness to prescribe a once-daily ICS for mild to moderate asthma ($F_{(1,105)} = 18.64, P < .001$; Figure 2).
- Readiness to prescribe a once-daily ICS for severe asthma was significantly predicted only by the belief in the efficacy of a once-daily ICS for severe asthma ($F_{(1,102)} = 52.26, P < .001$).

Patient Survey

- The distribution by province, the age, and the gender distribution of the patient sample were similar to that of Canadians with asthma in general (60% females).^{3, 37-40}
- The level of symptom control and use of short-acting β_2 -agonists for the purpose of rescue can be found in Table 1.

- Only 16.1% of the respondents met criteria for adequate control according to the 6 control criteria outlined in the Canadian Consensus Guidelines (1999).⁴¹
- Only 47.7% of patients took their ICS exactly as prescribed every day of the month.
- A once-daily dose formulation was preferred by 86.5% of the respondents versus 13.4% who preferred 2 or more daily doses ($\chi^2_{(1)} = 121.15, P < .001$).
- 66.1% thought that they would be more likely to take their medication as prescribed if they were supposed to take it only once per day.
- Poor compliance over the last month and high knowledge of correct ICS use and mode of action predicted preference for a once-daily ICS ($\chi^2_{(2)} = 6.50, P < .05$).
- Only lower self-assessed compliance over the last 3 months predicted projected compliance improvement with a once-daily ICS ($F_{(1,205)} = 5.51, P < .05$; Figure 3).

Figure 1. Physician Perceptions of Once-Daily ICS Therapy

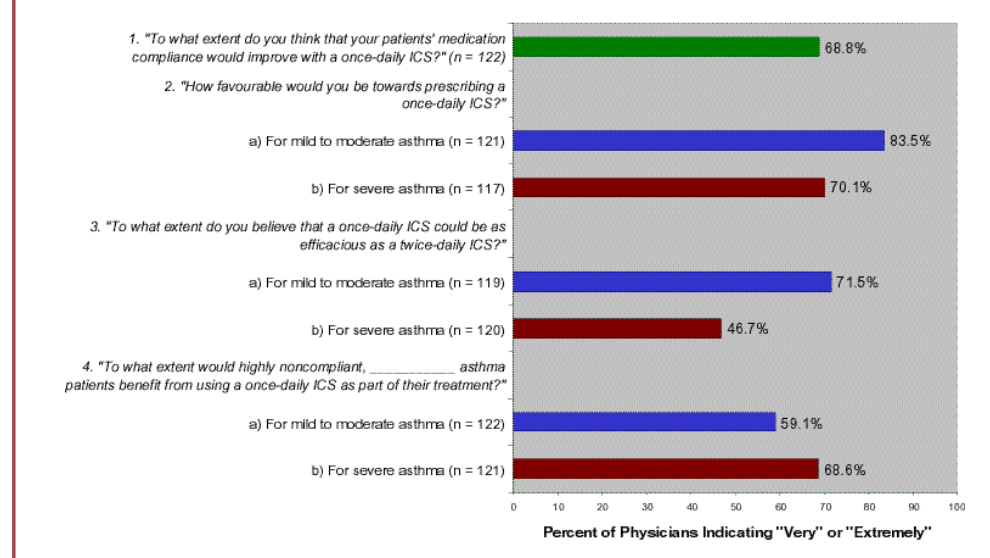
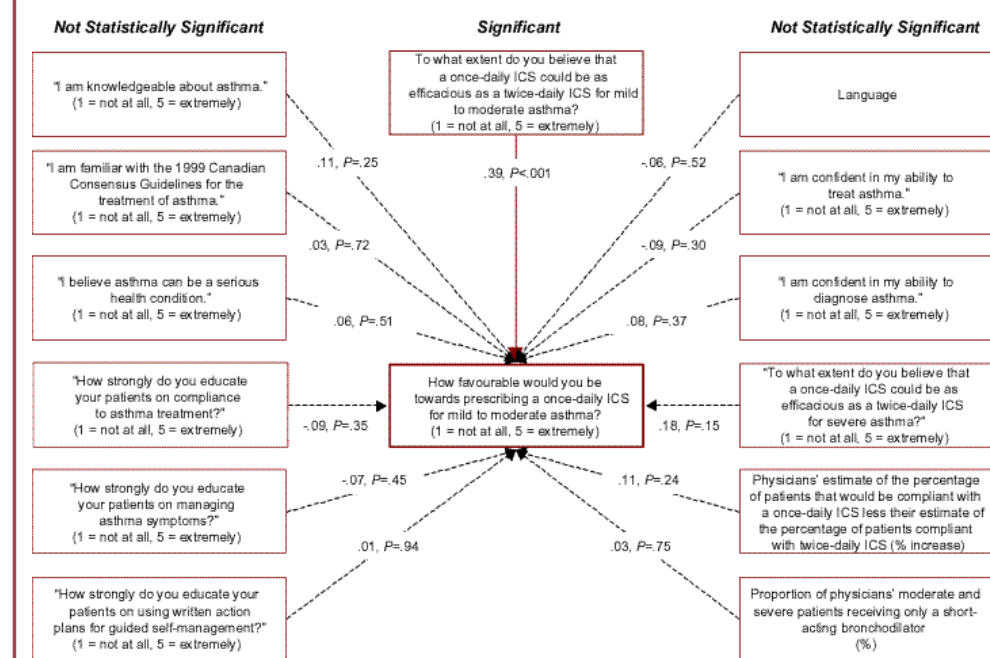


Figure 2. Predictors of Physicians' Readiness to Prescribe a Once-Daily ICS for Mild to Moderate Asthma



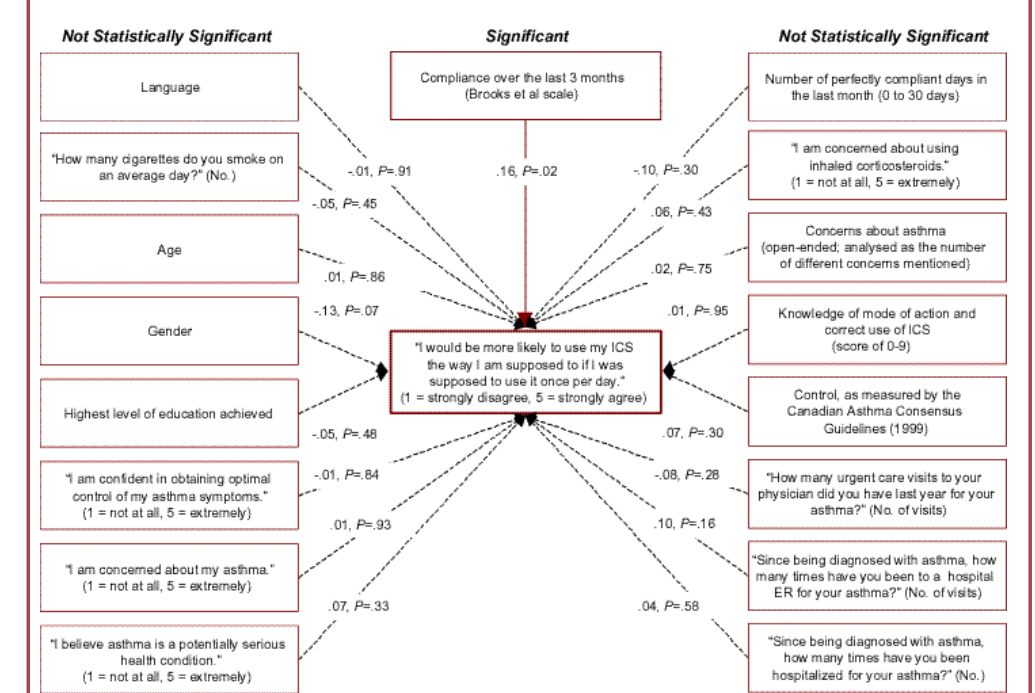
Only the belief in the efficacy of a once-daily ICS for mild to moderate asthma predicted readiness to prescribe a once-daily ICS ($R^2 = .14, F_{(1,105)} = 18.64, P < .001$). Values refer to β values and level of significance associated with each variable initially entered into the model.

Table 1. Patient Control of Asthma Symptoms, Use of Rescue Medication, and Perceptions of Once-Daily ICS Therapy

Symptoms	% Respondents	No. Days or Nights		Indications of Adequate Asthma Control		
		Mean	SD	% of respondents meeting all criteria for control	16.1 %	
Daytime symptoms (≥ 4 /wk)	37.5 %	3.5	2.8	Dose-Per-Day Preference and Expected Improvement in Compliance with a Once-Daily ICS		
Nighttime awakenings (≥ 1 /wk)	37.1 %	1.2	2	Dose-per-day preference	N	%
Limited phys activity/past 3 mo	55.4 %	—	—	Once per day	193	86.5
Missed school, work, social engagement/past 3 mo	30.8 %	—	—	Two or more times per day	30	13.4
Severe flare-up/past mo	53.1 %	3.1	6.1	Strongly disagree	9	4.2
Rescue Medication Use				Disagree	25	11.7
				No opinion	38	17.8
				Agree	41	19.2
Short-acting β_2 -agonist for rescue* (≥ 4 doses/wk)	37.5 %	5.4	8.6	Strongly agree	100	46.9

* In the calculation of the number of doses per week of short-acting bronchodilators for the purpose of rescue, those who had reported using a medication other than a short-acting β_2 -agonist for rescue were considered to have used no doses of β_2 -agonist in the previous week.

Figure 3. Predictors of Projected Compliance Improvement



Only poor compliance over the last 3 months (measured by the Brooks et al scale) explained unique variance ($R^2 = .16, F_{(1,205)} = 5.51, P < .005$). Values refer to β values and level of significance associated with each variable initially entered into the model.

CONCLUSIONS

- The results of these 2 surveys showed that patients and physicians perceive a once-daily ICS as a significant aid to compliance.
- Physicians are prepared to prescribe a once-daily ICS provided that its efficacy be proven.
- Patients who are struggling with poor compliance may also be aware that a simplified regimen would favourably influence their medication compliance.
- This dosage formulation is promising given the important role of noncompliance in asthma morbidity and mortality.