Review: self management education improves outcomes in children and adolescents with asthma

Wolf FM, Guevara JP, Grum CM, et al. ***Educational interventions for asthma in children.*** *Cochrane Database Syst Rev 2003;(1):CD000326 (latest version 2 Aug 2002).*

QUESTION: Do self management educational interventions improve lung function and decrease morbidity and healthcare use in children and adolescents with asthma?

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Data sources

Studies were identified by searching the Cochrane Airways Group's and Cochrane Schizophrenia Group's Special Registers of Controlled Trials and reviewing bibliographies of relevant articles.

Study selection

Studies were selected if they were randomised controlled trials (RCTs) or controlled clinical trials (CCTs) comparing an educational intervention designed to teach ≥1 self management strategy related to prevention, attack management, or social skills with usual care; measured objective outcomes; and patients were children or adolescents (2–18 y).

Data extraction

Data were extracted on sample size, patient demographic characteristics, details of the intervention, setting, study quality, and outcomes (lung function, morbidity and functional status, self perception, and healthcare use).

Main results

26 RCTs and 6 CCTs met the selection criteria (3706 children and adolescents). The self management educational programmes evaluated in individual trials differed by type of session (group, individual, or both), intensity (single session, 2 sessions, or ≥3 sessions), self management strategy (peak flow or symptom based strategy), and length of the intervention (mean 3.8 mo, range 1–12). Whereas all trials focused on asthma prevention measures (eg, identification and avoidance of asthma triggers) and/or attack management plans (eg, use of an asthma action plan), 13 trials incorporated social skills development into the educational strategy.

Meta-analyses of RCTs were done using a fixed effects model. Improvements in lung function and measures of self efficacy were greater in the self management group than in the usual care group (table). The mean number of days absent from school and mean number of visits to the emergency department were lower in the self management group than in the usual care group (table). The groups did not differ for days of restricted activity, nights disturbed by asthma, asthma severity scores, number of exacerbations, or visits to a general practitioner (table).

Conclusion

Self management educational interventions improve lung function and decrease some measures of morbidity and healthcare use in children and adolescents with asthma.

*Self management educational interventions v usual care in children and adolescents with asthma**

Outcomes at 1–12 months	Number of RCTs (n)	Standardised mean difference (95% CI)
Lung function	2 (106)	0.59 (0.20 to 0.99)
Self efficacy scale	5 (256)	0.33 (0.08 to 0.58)
Days absent from school	12 (1388)	–0.13 (–0.23 to –0.02)
Emergency department visits	9 (932)	–0.23 (–0.36 to –0.09)
Days of restricted activity	4 (290)	–0.20 (–0.43 to 0.04)†
Nights disturbed by asthma	2 (139)	–0.11 (–0.45 to 0.23)†
Asthma severity scale	3 (170)	–0.05 (–0.35 to 0.26)†
Number of exacerbations	3 (249)	–0.12 (–0.37 to 0.13)†
General practitioner visits	6 (619)	–0.15 (–0.31 to 0.01)†

*RCTs = randomised controlled trials. CI defined in glossary.
†Not statistically significant.

COMMENTARY

Evidence suggests that the global prevalence of asthma is increasing by as much as 50% every 10–15 years.[1] Usually, asthma can be controlled so that an individual experiences minimal symptoms (cough, wheeze, shortness of breath) and few disruptions in usual daily activities. As a result, the goal of asthma care guidelines internationally is to achieve minimal experience of symptoms and disruption because of asthma while using the least amount of medication.[1–4] Typically, core elements of asthma practice guidelines include confirming the diagnosis, providing appropriate medications, using environmental control strategies to minimise or avoid exposure to triggers, and providing asthma education and support for self management.[1–4]

Previous work by Gibson *et al* established that adults with asthma who receive self management education, RMR, and a written action plan show important improvements in asthma outcomes, such as use of healthcare services (emergency department visits and unscheduled doctor visits), days lost from work, nocturnal asthma, indirect costs, and quality of life.[5] Furthermore, Gibson *et al*'s work highlighted the fact that less intensive education programmes are not as beneficial,[5–6] specifically programmes that provide only patient information. The reviews by Wolf *et al* and Powell and Gibson extend our current understanding of key aspects of asthma care, education, and self management.

The review by Powell and Gibson suggests that optimal asthma control in adults, through the adjustment of medications, can be achieved equally well using either a written action plan or RMR. Furthermore, the action plan can be based on symptom experience alone or peak flow measurements plus symptoms. This finding is important because it shows that patients have the ability to self adjust medications according to a written plan developed in conjunction with asthma care providers. Thus, individuals who prefer to be more actively involved in their own care can adjust medications as a stepped course of action without seeking medical assistance.

An action plan is a written set of instructions that helps patients to self monitor the level of asthma control through symptom experience and/or peak flow measurements and outlines steps to maintain or regain asthma control. The action plan sets individual parameters for monitoring asthma control and steps to respond to the level of asthma control, such as increasing the dose of inhaled corticosteroid, starting an oral glucocorticoid, or seeking medical attention. The importance of action plans or self management plans for achieving optimal control is acknowledged in asthma care guidelines.[1–4]

The review by Wolf *et al* shows that the benefits of asthma self management programmes also apply to children and adolescents. All of the studies included in this review provided action plans and education on asthma prevention and management of worsening asthma.

Continued on next page

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Review: regular medical review is not better than written self management plans for optimising asthma control

Powell H, Gibson PG. ***Options for self-management education for adults with asthma.*** *Cochrane Database Syst Rev 2003;(1):CD004107 (latest version 12 Mar 2002).*

QUESTIONS: Is regular medical review (RMR) better than written self management plans for optimising asthma control in adults with asthma who use inhaled corticosteroids? Do health outcomes differ for written self management plans based on peak expiratory flow self management (PFSM) and those based on symptom self monitoring (SSM)?

Data sources

Studies were identified by searching the Cochrane Airways Group Special Register of Controlled Trials (which comprises results of searching Medline, EMBASE/Excerpta Medica, and CINAHL), and reviewing bibliographies of relevant articles.

Study selection

Studies were selected if they were randomised controlled trials (RCTs) of ≥2 self management asthma education interventions in adult patients with asthma who were >16 years of age, and reported relevant health outcomes.

Data extraction

2 reviewers independently extracted data on sample size, demographic characteristics, details of the intervention, setting, study quality, and outcomes. Outcomes included forced expiratory volume in 1 second (FEV_1), peak expiratory flow, hospital admissions, emergency department visits, unscheduled doctor visits, days lost from work or school, and use of rescue medications.

Main results

15 RCTs (2460 patients) met the selection criteria. Meta-analyses were done using a fixed effects model. Primary comparisons included optimal self management with RMR (6 RCTs) comparing 2 interventions that optimised asthma control using dose adjustment of inhaled corticosteroids either by active RMR or an individualised written self management plan where dose adjustment was based on PFSM or SSM. Meta-analysis of 3 RCTs (n=707) showed that the groups did not differ for FEV_1 or peak expiratory flow (table). The groups did not differ for hospital admissions for asthma (4 RCTs), emergency department visits (1 RCT), unscheduled doctor visits (3 RCTs), days off work or school (2 RCTs), nocturnal asthma (3 RCTs), or disrupted days (1 RCT).

The other primary comparison was PFSM with SSM (6 RCTs). Meta-analysis showed that the groups did not differ for hospital admissions (4 RCTs, n=412), emergency department visits (5 RCTs, n=512) (table), unscheduled doctor visits, days lost from work, or corticosteroid use.

Conclusions

Regular medical review is not better than written self management plans in adults with asthma who use inhaled corticosteroids. Self management plans based on peak expiratory flow self management did not differ from those based on symptom self monitoring, for optimising asthma control.

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*Peak expiratory flow self management (PFSM) v regular medical review (RMR) or symptom self management (SSM)**

Outcomes at ≥6 months	Number of trials	Comparison	Standardised mean difference (95% CI)		
Mean forced expiratory volume in 1 second (ml)	3	PFSM *v* RMR	0.01 (–0.14 to 0.15)†		
Mean peak expiratory flow (ml)	3	PFSM *v* RMR	0.06 (–0.09 to 0.21)†		
			Weighted event rates	**RRI (CI)**	**NNH**
Hospital admissions (patients)	4	PFSM *v* SSM	4% *v* 3%	17% (–56 to 12)	Not significant
				RRR (CI)	**NNT**
Emergency department visits (patients)	5	PFSM *v* SSM	15% *v* 16%	9% (–35 to 39)	Not significant

*Abbreviations defined in glossary; RRI, RRR, NNH, NNT and CI calculated from data in article.
†Not statistically significant

COMMENTARY—*continued from previous page*

In summary, these reviews establish the importance of the recommendations of asthma care guidelines. Patients with asthma should receive self management education and a written action plan, based on symptoms or peak expiratory flow, which is tailored to individual needs. After determining a patient's ability to follow an action plan and readiness to learn, nurses need to ensure that each patient has an action plan that is understood and used appropriately, and that the recommended medications are used with appropriate techniques. Asthma education should be regarded as a process, rather than a single event, with ongoing reassessment and reinforcement at each encounter.

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1 New Zealand Guidelines Group. The diagnosis and treatment of adult asthma. September 2002. http://www.nzgg.org.nz/library/gl_complete/asthma/full_text_guideline.pdf
2 National Asthma Education and Prevention Program. *Guidelines for the diagnosis and management of asthma.* National Institute of Health Publication No. 97-4051, 1998. http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.pdf
3 Scottish Intercollegiate Guidelines Network and The British Thoracic Society. British guidelines on the management of asthma. *Thorax* 2003;**58**:S1–94.
4 Boulet LP, Becker A, Berube D, *et al.* Canadian asthma consensus report, 1999. *CMAJ* 1999;**161**:S1–61.
5 Gibson PG, Powell H, Coughlan J, *et al.* Self-management education and regular practitioner review for adults with asthma. *Cochrane Database Syst Rev* 2003(1):CD001117.
6 Gibson PG, Coughlan J, Wilson AJ, *et al.* The effects of limited (information only) asthma education on health outcomes of adults with asthma. *Cochrane Database Syst Rev* 2000(2):CD001005.

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