Efficacy of interventions to improve adherence to inhaled corticosteroids in adult asthmatics: impact of using components of the chronic care model

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CRD summary
The authors concluded the evidence supported the use of chronic care model components as a framework for the design and implementation of interventions to improve adherence to inhaled corticosteroids among adults with asthma. The authors’ conclusions reflect the evidence presented but the variation between studies means the reliability of the conclusions is uncertain.

Authors' objectives
To assess the efficacy of interventions to improve adherence to inhaled corticosteroids among adults with asthma and whether the use of chronic care model components resulted in greater treatment adherence.

Searching
MEDLINE and PsycINFO were searched up to August 2010 for studies published in English. Search terms were reported. Reference lists of identified articles and reviews were searched and experts in the field were contacted for additional studies.

Study selection
Studies that assessed the effectiveness of an intervention that included asthma controller medication (such as inhaled corticosteroid medication) for adults with asthma were eligible for inclusion. Adherence to inhaled corticosteroid treatment was the outcome of interest.

In the included studies, the number of chronic care management components varied between studies. Most studies included one component (self-management or delivery system design); the remainder included two components (self-management and delivery system design) or four components (self-management plus decision support, delivery system design, and clinical information systems). The duration of the interventions varied from one 30 minute session to more than 12 hours. Most of the participants had moderate to severe asthma. Participants age ranged from 35 to 50 years (where reported). The proportion of women ranged from 52% to 73%. Measurements of adherence were self-reporting, pharmacy refill rates, general practitioner audits, or medication monitoring devices.

Two reviewers independently selected studies for inclusion.

Assessment of study quality
Study quality was assessed using the Downs and Black checklist. Studies were assigned a quality rating based on the final score: high (16 or more); moderate (8 to 16); and low (less than 8).

It appeared that two authors independently assessed study quality.

Data extraction
Data were extracted on adherence for intervention and control groups and standardized to allow calculation of effect sizes, together with 95% confidence intervals. Interventions were categorised based on chronic care model components including self-management, decision support, delivery system design, and clinical information system. Data were extracted and analysed at 12 months where the studies conducted follow-up of more than 12 months.

Two reviewers independently extracted data.

Methods of synthesis
Combined effect size and 95% confidence intervals were calculated according to the number of chronic care model components included in the interventions using methods by Wilson and Lipsey. Heterogeneity was assessed using $I^2$. Effect sizes were categorised as small (<0.20), medium (0.20 to <0.50), large (0.50 to <0.80), or very large (0.80 or
Results of the review
Eighteen RCTs (RCTs) were included in the review. The number of participants was unclear but was more than 2,450 (range 25 to 612). All the trials were categorised as good or moderate quality. Follow-up ranged from one week to two years. Participant retention rates during the follow-up periods ranged from 74% to 98%.

A greater number of chronic care model components within interventions was associated with stronger effects on inhaled corticosteroid adherence: interventions with one component (self-management skills or decision support) had a medium effect (ES 0.29, 95% CI 0.16 to 0.42; 13 comparisons); interventions with two components (self-management skills and delivery system design or decision support) had a large effect (ES 0.53, 95% CI 0.40 to 0.66; five comparisons); and interventions with four components had a very large effect (ES 0.83, 95% CI 0.69 to 0.98; three comparisons). There was significant heterogeneity ($I^2=84\%$) for the analysis of trials with four components.

Authors’ conclusions
The findings supported the use of chronic care model components as a framework for the design and implementation of interventions to improve adherence to inhaled corticosteroids among adults with asthma.

CRD commentary
The review question was clear with broadly defined inclusion criteria. Several relevant sources were searched, but the exclusion of studies not in English may mean that some studies were missed. Appropriate methods were used to reduce reviewer error and bias throughout the review process.

Study quality was assessed using an appropriate tool. The overall quality for each study was reported, but the quality results reported did not match the categories stated in the review methods. Studies were included in a meta-analysis where data were sufficient, but statistical heterogeneity and variation between studies was not explored.

The authors’ conclusions reflect the evidence presented but variation between studies means the reliability of the conclusions is uncertain.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that further research was required to understand the mechanisms explaining the beneficial effects of multi-component programmes.

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