

Evidence briefing on adherence to treatment for respiratory diseases

- Prevalence of respiratory diseases (primarily asthma and COPD) in the NHS Airedale, Bradford and Leeds region is above the national average. Hospital admissions and associated resource use has risen substantially.
- There is evidence that risk of admission for asthma can be almost three times higher for people of South Asian background. Anecdotal evidence from local clinicians also suggests that some patients from minority ethnic populations (particularly those of South Asian heritage) are reluctant to use inhalers for cultural reasons.
- Given that the ethnic minority population is above the national average, understanding and addressing this issue could contribute to improved management and outcomes for respiratory disease locally.
- There is some albeit limited evidence that culture-specific asthma education programmes for minority populations can improve some outcomes. However, the small number of trials included and the fact that only one was from a UK setting make the relevance of the findings uncertain.
- The evidence for interventions to improve medication adherence in asthma and/or COPD is fairly extensive but only a few trials have reported improvements in both adherence and treatment outcomes. NICE guidance on medication adherence states that the evidence is inconclusive and interventions should only be used in response to a specific need.
- There is a substantial amount of existing evidence that could be used to inform decision-making in this area. Interpretation of the evidence is made more difficult by the complexity and intensity of many of the interventions and uncertainty about the generalisability of findings to the local population.
- This briefing has been produced for background purposes rather than to inform a specific decision. We would be happy to undertake a more detailed assessment to support implementation of a specific intervention as required.

This evidence briefing has been produced by the Centre for Reviews and Dissemination (CRD). Full details of methods are available on request (paul.wilson@york.ac.uk or duncan.chambers@york.ac.uk)

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Background

Data from the Bradford Public Health Observatory indicate that prevalence of chronic obstructive pulmonary disease (COPD) and asthma in Bradford is in line with the average for Yorkshire and Humberside but above the national average for England (1.8 vs. 1.5% for COPD and 6.1% vs. 5.7% for asthma in 2008–9). While prevalence is relatively stable, patient numbers with the conditions are rising in line with increases in population. As a result, prescriptions for inhaled corticosteroids and the amount spent on them have also risen. There is only a weak correlation between increased spending on inhaled corticosteroids and reduced hospital admissions for asthma.

Hospital admissions for COPD in Bradford are below regional but above national averages. Admissions for asthma are above both the regional and national average. Between 2005–6 and 2009–10, spending on admissions for COPD increased by 19% to £2.4 million and spending on admissions for asthma rose by 31% to £843,000. These data suggest that there is scope to improve management to reduce admissions, particularly for asthma.

Anecdotal reports from local clinicians suggest that some patients from black and minority ethnic populations (particularly those of South Asian heritage) are reluctant to use inhalers for cultural reasons. Given that the ethnic minority population in Bradford is above the national average, understanding and addressing this issue could contribute to improved management of respiratory disease locally and hence to improved outcomes and better use of resources.

This briefing provides a short overview of evidence around:

- ethnicity and asthma (the sources we found focused specifically on asthma rather than COPD)
- interventions to improve medication adherence
- interventions to improve management of asthma or COPD in ethnic minority populations.

We have provided some assessment of the quality of the evidence and its relevance to the population and setting of Bradford and Airedale. This briefing has been produced for background purposes rather than to inform a specific decision. We would be happy to produce a more detailed briefing if and when a particular intervention is being considered for implementation.

Methods

This briefing is based primarily on existing sources of synthesised and quality-assessed evidence, primarily systematic reviews and national guidelines.

We initially searched for relevant research evidence in the following sources:

- DARE (Database of Abstracts of Reviews of Effects) for quality-assessed systematic reviews
- Cochrane Database of Systematic Reviews (CDSR)
- NHS EED for quality-assessed economic evaluations
- Health Technology Assessment (HTA) database.

We also screened the NICE guidelines on medicines adherence¹ and COPD² and the British guideline on management of asthma.³

We did not search systematically for evidence on barriers and facilitators of adherence to treatment for respiratory conditions in black and minority ethnic populations. Some relevant evidence was found using the above sources and limited searches of PubMed, including the 'related citations' function.

Evidence base for asthma and ethnicity

There is an extensive literature on this topic and a systematic treatment of it is outside the scope of this service. A systematic review of studies from the UK⁴ reported that South Asian children had a lower frequency of symptoms suggestive of asthma compared with black or white children. A similar pattern was found for asthma diagnosed by a clinician (no relevant studies for adults were found). However, the risk of hospital admission for asthma was almost three times higher in South Asian people (adults and children combined) compared with white people (odds ratio 2.9, 95% confidence interval 2.4 to 3.4).

A non-systematic review focused on the UK setting identified a number of factors that might explain the unequal impact of ethnicity on asthma outcomes.⁵ These included health beliefs, attitudes and behaviours; cross-cultural communication and health literacy; quality of care; and socio-economic status. Health beliefs of minority ethnic groups that could affect adherence to treatment included lack of familiarity with the idea of preventative treatment, associated with the belief that asthma is an acute rather than a chronic condition; coping with exacerbations using family support rather than by increasing medication dosage; and a greater tendency to use complementary and alternative medicine interventions. Similar points were made in a systematic scoping review by Poureslami et al.⁶ Although this review focused specifically on Canada, many of the issues are common between Canada and the UK.

A specific issue around use of inhalers is the use of alcohol as a component of the propellant, which can make Muslim patients in particular reluctant to use them. A study in 2008 found that the majority of CFC-free inhalers contain alcohol although alcohol-free alternatives are available for both rescue and preventative treatments.⁷

Evidence base for effectiveness

The evidence base for effectiveness of interventions that might be considered to address this issue covers three main areas: interventions to increase adherence to prescribed medications; interventions specifically related to problems with inhalers; and educational interventions to improve management (including self-management).

In interpreting the evidence it should be noted that there is evidence from systematic reviews that patients from ethnic minority groups (for example South Asian patients⁸) tend to be under-represented in clinical trials generally. For asthma trials specifically, a recent systematic review found that published trial reports do not consistently report on the ethnicity of trial participants and consequently the generalisability of the findings may be difficult to assess.⁹

Interventions to improve medication adherence

Cochrane review

A Cochrane review of interventions to improve medication adherence¹⁰ included 12 studies in patients with asthma or COPD. Only randomised trials with at least 6 months of follow-up were included. Trials had to assess both adherence and treatment outcomes. Three trials reported a positive effect of the intervention on both adherence and treatment outcomes, while three others found positive effects for adherence only.

These trials represent the best available evidence on interventions to improve adherence but the evidence synthesis presented was poor, comprising only a narrative description of each trial. Other information was presented in tables and appendices but few details of patients and settings were reported, making it difficult to assess the generalisability of the findings. Other limitations were small samples in many trials (limiting the trials' ability to detect any differences that may

exist) and the complexity/intensity of the interventions used in some trials (which makes it difficult to distinguish the essential components and is likely to limit the use of the intervention outside research settings).

NICE guidance

The NICE guidance on medicines adherence¹ drew on and updated the Cochrane review. The results were synthesised by type of intervention rather than by indication which makes the relevance of the results to people with asthma or COPD difficult to assess. In general terms, the guideline stated that evidence to support interventions to increase medication adherence is inconclusive and interventions should only be used when a specific need is identified.

Interventions for difficulties with inhalers

The British guideline on asthma management and the NICE COPD guidance both address difficulties with inhalers. The asthma guideline stresses the need for training and cites evidence that teaching technique can increase the percentage of patients using inhalers correctly.³ The guidance also recommends (as good practice) reassessment of inhaler technique as part of a structured clinical review and stresses the need to find alternatives for those patients who have difficulties with inhaler technique.

The NICE COPD guidance² states that few patients are unable to master inhalers (with a spacer device if needed). The choice of device for those patients unable to use inhalers should be determined by patient choice and local cost. Nebulisers also have limitations and should not be thought of as a 'panacea' for those unable to use inhalers.

Interventions to improve asthma management in minority populations

Cochrane review

A Cochrane review by Bailey et al. compared culture-specific asthma education programmes for children or adults with generic education programmes or usual care.¹¹ Only randomised trials were eligible for inclusion. Four trials with 617 participants were included. One trial recruited adults only, two children only and one included both children and adults (11–59 years). Only this last trial¹² was conducted in the UK; 344 participants from a South Asian background were recruited. Results for children and adults were not reported separately.

The primary outcome of the systematic review was asthma exacerbations during follow-up. The UK study found no statistically significant difference between the culture-specific and usual care groups for hospitalisation, requirement for additional steroids or emergency department visits. The other adult study did not report numerical data for this outcome, so meta-analysis was not possible.

The trials involving children reported a range of exacerbation-related outcomes, which again prevented meta-analysis. One trial found that the culture-specific intervention reduced hospitalisations during the 6 months following the intervention by 68% (risk ratio 0.32, 95% confidence interval 0.15 to 0.70). This trial involved Puerto Rican children so the results are unlikely to be generalisable to the population of Bradford.

Results were reported for a variety of other outcomes. In the two adult studies, the culture specific programme was associated with a small but statistically significant increase in asthma quality of life scores. Children's asthma knowledge scores were also significantly increased in the intervention group in one trial.

In summary this was a well-conducted systematic review and provides evidence that culture-specific educational interventions can improve some asthma outcomes. However, the small number of trials included and the fact that only one was from a UK setting make the relevance of

the findings uncertain.

Asthma guideline

The British guideline on asthma management cites evidence that education of primary care clinicians can improve diagnosis, prescribing, education and continuity of care for ethnic minority children (section 8.1.4).³ The same guideline notes that self-management programmes may be less effective for members of minority groups but that there is a lack of research on appropriate interventions (section 9.1.2).

Evidence base for cost-effectiveness

Searches of NHS EED using combinations of search terms related to asthma/COPD, adherence/compliance and inhalers produced varying results depending on the exact search terms. None of the economic evaluations found was obviously related to the issue of improving adherence to treatment with inhaled medication in ethnic minority patients. A fuller assessment of this evidence could be performed to inform a specific decision.

The NICE guideline of medicines adherence includes a review of evidence on cost-effectiveness based on an update of a 2005 systematic review by Elliott et al.¹³ The Elliott et al. review included some studies on asthma but has not been assessed in detail due to lack of access to the original paper. The main finding of the review was that methodological and reporting limitations of the studies made it difficult to draw firm conclusions about the cost-effectiveness of interventions to improve medication adherence.

The British asthma guideline and the NICE COPD guideline do not appear to contain any relevant economic evidence.

Implications for NHS Airedale, Bradford and Leeds

General

There is a substantial amount of existing evidence that could be used to inform decision-making in this area. Interpretation of the evidence is made more difficult by the complexity and intensity of many of the interventions and uncertainty about the generalisability of findings to the local population. A further complicating factor is that the issue can be framed in various different ways. This briefing considers issues around treatment adherence and self-management in ethnic minority populations. If the question had been expressed in terms of the need to reduce unnecessary hospital admissions, a different range of evidence would be relevant. We would be happy to undertake a more detailed assessment to support implementation of a specific intervention as required.

Implementation

It is difficult to assess implementation issues in the absence of a specific intervention being considered by NHS Airedale, Bradford and Leeds. Further information on use of metered-dose inhalers containing alcohol could be useful in informing whether and how to address this issue (for example, by providing information and/or facilitating use of alternatives).

Health equity

Given the evidence that asthma outcomes tend to be worse in ethnic minority populations,⁴ any intervention to improve management would be expected to have a positive effect on health equity. COPD is associated with social disadvantage,¹⁴ so again any improvements in management should improve health equity.

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