Review: long acting β_2 agonists and inhaled corticosteroids reduce exacerbations in chronic obstructive pulmonary disease

Sin DD, McAlister FA, Man SF, *et al.* Contemporary management of chronic obstructive pulmonary disease: scientific review. *JAMA* 2003;**290**:2301–12.

Q What are the effects of common treatments for chronic obstructive pulmonary disease (COPD) on patient outcomes?

METHODS

Data sources: Medline (1980 to 1 May 2002), Cochrane Database of Systematic Reviews, bibliographies of published articles, and experts.

Study selection and assessment: English language randomised controlled trials (RCTs) with ≥ 3 months of follow up in adults with COPD that assessed long acting (LA) β_2 agonists (β_2 As); LA inhaled anticholinergics (tiotropium); combined short acting (SA) β_2 As and SA anticholinergics; inhaled corticosteroids; combined inhaled corticosteroids and LA β_2 As; pulmonary rehabilitation (with ≥ 6 wks follow up); long term nocturnal non-invasive mechanical ventilation; domiciliary O_2 therapy; or disease management. Analysis was restricted to RCTs with blinded ascertainment of outcomes (only drug interventions where placebo was possible)*, ($>90\%$)* follow up data, and well balanced baseline characteristics in treatment and control groups.

Outcomes: COPD exacerbations and mortality.

*Information provided by author.

MAIN RESULTS

The results are summarised in the table.

CONCLUSION

Long acting (LA) β_2 agonists (β_2 As) and inhaled corticosteroids, with and without LA β_2 As, reduce exacerbations but not mortality in patients with chronic obstructive pulmonary disease

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Sources of funding: Canadian Institutes of Health Research and Alberta Heritage Foundation for Medical Research.

A modified version of this abstract appears in *ACP Journal Club* and *Evidence-Based Medicine*.

Commentary

The review by Sin *et al* contributes to the knowledge base on pharmacological and non-pharmacological management of COPD by going beyond evaluation of physiological endpoints, such as FEV₁, to include patient centred outcomes, such as health related quality of life (HRQOL), exacerbations, and mortality. However, the search strategy was limited to English language studies, which could have had an impact on the findings.

COPD is a progressively debilitating condition that requires multimodal interventions to optimise health and functioning. Traditionally, SA β_2 As and anticholinergic medications, alone or in combination, have been used for symptomatic relief of COPD. Recently, LA bronchodilators were introduced to achieve improvements in lung function for longer time periods. LA β_2 As and anticholinergic medications, along with inhaled corticosteroids, improve HRQOL and reduce exacerbations in patients with moderate to severe COPD. Pulmonary rehabilitation, which may include exercise training, education, and behaviour modification, also improves HRQOL in such patients. Home oxygen prolongs survival but only in patients with resting hypoxia.

Disease management or self management programmes provide patients with the knowledge, skills, and support needed to manage their illness and aim to improve overall functioning. Although commonly acknowledged as an essential component of COPD care,¹ efficacy of such programmes remains unclear, and more research is needed to evaluate effects on health outcomes. On the other hand, smoking cessation is the only measure that has been shown to slow decline in lung function and disease progression.² Therefore, patients with COPD who smoke must have access to resources to help them to quit.

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1 O'Donnell DE, Aaron S, Bourbeau J, *et al.* *Can Respir J* 2003;**10**(Suppl A):11A–65A.

2 Anthonisen NR, Connett JE, Kiley JP, *et al.* *JAMA* 1994;**272**:1497–505.

Summary of efficacy data for interventions for chronic obstructive pulmonary disease*

Comparisons	RRR/RI (95% CI)	
	Exacerbation	Mortality
LA β_2 A v placebo	RRR 21% (10 to 31)	RRR 24% (–48 to 61)†
Tiotropium v placebo	RRR 26% (11 to 38)	NA
Tiotropium v LA β_2 A	RRR 7% (–8 to 20)†	NA
Tiotropium v ipratropium	RRR 22% (5 to 37)	NA
SA β_2 A + anticholinergic v SA β_2 A	RRR 32% (9 to 49)	RRI 18% (–66 to 308)†
SA β_2 A + anticholinergic v ipratropium	RRI 4% (–35 to 68)†	RRI 256% (–41 to 2053)†
Inhaled corticosteroids v placebo	RRR 24% (20 to 28)	RRR 22% (–5 to 42)†
Inhaled corticosteroids + LA β_2 A v placebo	RRR 30% (22 to 38)	RRR 48% (–34 to 80)†
Inhaled corticosteroids + LA β_2 A v LA β_2 A	RRR 20% (10 to 29)	NA
Inhaled corticosteroids + LA β_2 A v inhaled corticosteroids	RRR 10% (–2 to 20)†	NA
Pulmonary rehabilitation v usual care, placebo, or education	NA	RRR 10% (–24 to 35)†
Supplemental O_2 v usual care (patients with resting PaO ₂ <60 mm Hg sea level)	NA	RRR 39% (18 to 54)
Supplemental O_2 v usual care (patients with resting PaO ₂ $\geq$ 60 mm Hg sea level)	NA	RRI 16% (–15 to 58)†
Disease management v usual care	NA	RRR 37% (–4 to 62)†

*LA β_2 A = long acting β_2 agonist; SA β_2 A = short acting β_2 agonist; NA = not assessed. Other abbreviations defined in glossary; RRR, RRI, and CI calculated from data in article.

†Not significant.