Initiating beta-blockers in patients with asthma

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Beta-blockers are widely prescribed in primary care for the management of cardiovascular disease. Beta-blockers are used in people with acute coronary syndrome and to prevent secondary coronary events. They also reduce death in people with chronic heart failure and are recommended first line for the management of angina and as rate control in managing cardiac arrhythmias.1 Although beta-blockers have fallen out of favour for the management of hypertension, they still play a role in younger people intolerant of renin-angiotensin system inhibitors and in those with resistant hypertension. Meanwhile, noncardiovascular uses of beta-blockers include the management of anxiety, migraine and thyrotoxicosis (propranolol) and the management of pre-eclampsia (labetalol).

Safety concerns in asthma

For decades beta-blockers have been avoided in asthma because they may trigger exacerbations in susceptible people. The nonselective beta-blocker propranolol was first introduced into clinical practice in the 1960s shortly followed by reports of asthma exacerbations in selected patients.2 So why do beta-blockers affect people with asthma? Airway calibre in people with asthma partly depends upon the body’s sympathetic drive to control airway smooth muscle tone. This mechanism underpins the rationale for using inhaled short-acting beta-agonists (SABAs) such as salbutamol for the acute relief of asthma symptoms. Beta-blockers block this sympathetic drive resulting in bronchoconstriction.

Life-threatening events have mainly resulted from unintended exposure to nonselective beta-blockers in patients with poorly controlled asthma.3 These effects have led to the development of cardioselective beta-blockers such as atenolol and bisoprolol in an attempt to spare the pulmonary adverse effects in people with asthma.

Current perspective

For years safety concerns have led to guidelines recommending that beta-blockers should be contraindicated in asthmatic patients, often resulting in beta-blockers being withheld from people with asthma who have strong clinical indications for their use. Indeed, a history of reversible airways disease is the main reason why people with acute coronary syndrome do not receive beta-blocker therapy despite their potential benefits.4 In contrast, despite safety concerns and guideline recommendations around 2.5 per cent of adults with asthma are actually prescribed beta-blockers in primary care as a result of co-morbidity, many of whom receive repeat prescriptions.5 Given the increasing prevalence of multimorbidity, these circumstances are likely to occur more often, which raises questions about the actual risk posed from beta-blockers in asthma and whether it is reasonable to prescribe beta-blockers to some people.

Risk from initial exposure

The greatest risk from beta-blockers in people with asthma follows initial exposure, which a recent meta-analysis has helped to quantify.6 Cardioselective beta-blockers mainly given at moderate to high doses on average caused a 7 per cent fall in forced expiratory volume in 1 second (FEV1) and no significant increase in respiratory symptoms in randomised blinded placebo-controlled trials. In comparison nonselective beta-blockers, consisting mainly of propranolol, on average caused a 10 per cent fall in FEV1 and respiratory symptoms in approximately 1 in 13 patients. Both classes of beta-blockers had a tendency to cause falls in FEV1 of greater than 20 per cent in around one in eight asthmatic patients, with a dose-response relationship demonstrated for cardioselective beta-blockers.

Given that beta-blockers have opposing effects to SABAs, this review also addressed an important safety concern relating to the effectiveness of SABAs following acute beta-blocker exposure. Although cardioselective beta-blockers blunted SABA response by around 10 per cent, lung function values typically still increased well beyond baseline. In contrast, nonselective beta-blockers blocked the effectiveness of SABAs to a much greater degree.

Implications for clinical practice

Most prescribing interventions carry some risk and prescribing beta-blockers to people with asthma is no exception. However, risk from beta-blockers in asthma should be balanced against the potential benefits, which are greatest to people with cardiovascular disease. Cardioselective beta-blockers may trigger exacerbations in people with asthma if initiated at high enough doses when cardioselectivity may be lost. In general however, risk from initiating cardioselective beta-blockers in people with controlled asthma is likely to be low when using a highly cardioselective beta-blocker, such as bisoprolol, commenced at low dose and gradually up titrated depending upon tolerability, because SABAs still appear to be effective should any respiratory symptoms develop.

Although some people with asthma may tolerate acute exposure to nonselective beta-blockers, risk is greater and...
rescue therapy is less effective suggesting their risk probably outweighs any potential benefits for existing clinical indications and should be avoided. What is certain is that by better quantifying the risks of drugs such as beta-blockers in asthma, prescribers should be better placed to judge their risks versus benefits among individual patients.

References

Declaration of interests
None to declare.

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