QIPP Detail Aid Support Document

Providing support for quality in prescribing

SALBUTAMOL - DOES IT REALLY NEED TO BE NEBULISED?

WHAT IS THE PROBLEM?

Salbutamol delivered by nebuliser is often used long term in patients with moderate-severe COPD. It is more expensive than inhalers and maintenance of the equipment adds to the overall cost. Only about 10% of a dose of salbutamol is delivered to the airways using this method, comparable with doses delivered using an inhaler with a spacer.

Doses of salbutamol given by nebuliser are much larger than those delivered by inhaler because it is a relatively inefficient method of delivery. Drug is wasted during exhalation and in the apparatus intended for delivery of the drug.[1] For this reason, the amount delivered from a 2.5mg nebulised dose for example is around 250micrograms.

In the last year over 52,000 prescriptions for salbutamol nebules were issued in the East Midlands at a cost of £363,000. If half of patients had used their hand held inhalers instead, over £180,000 would have been available to spend on other treatments. Based on one county's figures, there are around 2000 patients per million population using nebulisers (not all for COPD), at an estimated annual cost of about £100,000 for maintenance and consumables.

These figures relate to the year to June 2015. It is probably an underestimate of actual use, as hospitals provide initial supplies and often support servicing and provision of consumables associated with nebulisers.

Patients who use nebulised salbutamol also need to be provided with hand-held inhalers and spacers, in case of breakdown of the nebuliser and for use when they are away from home. Nebulised salbutamol is often therefore an add-on to use of hand-held inhalers.

The figures of 2000 nebulisers per million are an estimate based on provision in Leicestershire, however it is unclear what proportion of these have COPD and are nebulising salbutamol.

WHAT IS THE EVIDENCE?

Salbutamol given by nebuliser is often used in patients with more severe forms of COPD and may be preferred by some who claim that it relieves breathlessness. There is little objective evidence to support this. One trial in patients with COPD found that relief of breathlessness lasted on average less than 45 minutes and may have been related to a cooling effect on the face.

The trial cited here[2] involved patients with severe COPD who were given salbutamol delivered by nebuliser or from an MDI with spacer device. Although the nebulised treatment provided better relief of breathlessness 5 minutes after nebulisation, there was no difference between the two when measured again after 45 minutes, suggesting that the initial observed difference was due to factors unrelated to bronchodilatation and likely due to the moistening effect of the nebulised solution on the airways. Another study compared bronchodilatation with salbutamol delivered by either nebuliser or MDI plus spacer in patients admitted to hospital during an exacerbation of COPD.[3] It found similar degrees of reversibility with nebulised salbutamol or delivered from an MDI with large volume spacer. Improvement in mean FEV1 was slightly better with the nebulised treatment (16.7 percent vs 13.4 percent), but this was not statistically significant.

NICE guidance for COPD advises that in most cases, bronchodilator therapy is best delivered using a hand-held inhaler device. Spacers can often be helpful in ensuring effective delivery of the dose as they reduce the need for co-ordination of actuation and inhalation of the aerosol.

Using the correct inhalation device is important and it is generally agreed that a metered dose inhaler (MDI) with spacer is better and more effectively used than MDI alone in many patients. NICE guidance[4] is that 'most patients – whatever their age – are able to acquire and maintain adequate inhaler technique given adequate instruction. The exception to this is that those with significant cognitive impairment'. NICE guidance suggests repeated single actuations of the inhaler, each followed by inhalation. Tidal breathing can be used as it is as effective as single breaths.

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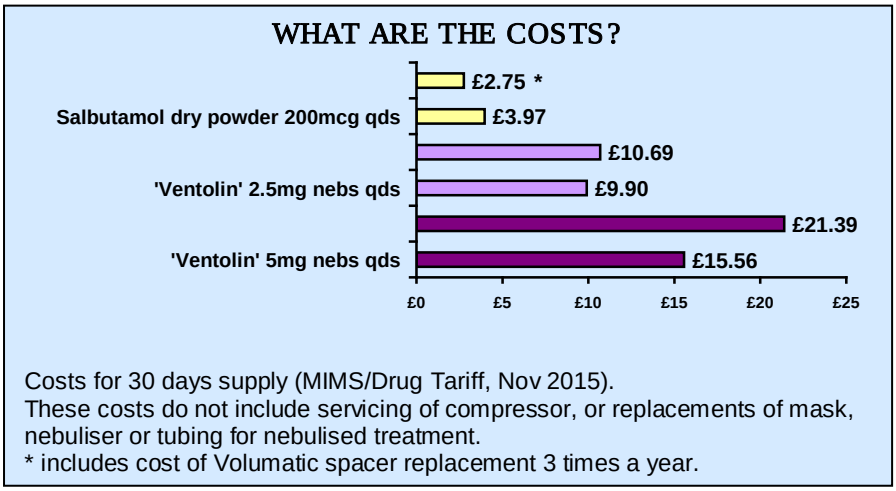
NICE guidance[2] also says that COPD patients should not continue on nebulised treatment without assessment and confirmation that at least one of the following occurs: a reduction in symptoms; an increase in ability to undertake activities of daily living; an increase in exercise activity, or an improvement in lung function.

Nebulised salbutamol treatment should not continue unless there are demonstrable benefits over hand held inhalers.

Nebulisers and associated equipment need regular cleaning and servicing. The mask, nebuliser and tubing should be washed at least daily (this is often not done) and need replacing at intervals. The compressor used to drive the nebuliser should also be serviced annually.

Maintenance of nebuliser equipment is important, as bacterial or fungal growth in masks or tubing may result in respiratory infections. These consumables need to replaced at intervals too. Patients and/or their carers need to understand the requirements of cleaning, also of servicing the compressors, and how to recognise when the equipment is malfunctioning, if this should occur.[1]



Costs for 30 days supply (MIMS/Drug Tariff, Nov 2015).
These costs do not include servicing of compressor, or replacements of mask, nebuliser or tubing for nebulised treatment.
* includes cost of Volumatic spacer replacement 3 times a year.

Note that Ventolin brand nebules are cheaper than Drug Tariff prices, particularly the 5mg strength which are 27% cheaper.

KEY MESSAGES

- **Salbutamol administered by nebuliser delivers only a small fraction (around 10%) of the dose to the airways. Patients with COPD should be able to get comparable bronchodilatation using hand held inhalers (using a spacer for metered dose inhalers).**
- **Nebulised salbutamol costs around 5-10 times the cost of similarly effective doses delivered by inhaler. Nebulised treatment also incurs significant costs for compressor, nebuliser chamber, masks and tubing, in addition.**
- **NICE guidance for COPD advises that unless there is a confirmed improvement in symptoms, daily activities, exercise activity or lung function, nebulised salbutamol treatment should not continue. For those that do need to continue, Ventolin brand nebules are currently cheaper.**

References
1. EMIS. Patient.co.uk website, at http://patient.info/doctor/nebulisers-in-general-practice
2. Poole P et al. Respir Med 2005; 99:372-6
3. Berry R et al. Chest 1989;96:1241-1246
4. NICE guidance for COPD, accessed via https://www.nice.org.uk/guidance/cg101/chapter/1-Guidance#managing-stable-copd, section 1.2.2