Primary Care Respiratory Society UK - Opinion No.49

Opinion

Tailoring Inhaler Choice

Introduction

Inhalation is the main route for administration of drugs for conditions such as asthma or chronic obstructive pulmonary disease. The advantage of administering drugs by inhaler is that drugs are delivered directly to the site of action within the airways. The onset of action is rapid and systemic adverse effects are minimised.[1] However, for an inhaler to be effective the correct drug must be prescribed and the device must be used correctly. Poor inhaler technique is common. It is estimated that only 15% of patients use pMDI's correctly.[2] Inadequate technique is associated with:-

- Poor symptom control
- Increased emergency visits[1]
- Wasted resources

Choosing a drug and a corresponding device from the large variety available is potentially confusing.[3] The British Thoracic Society and Scottish Intercollegiate Guideline Network (BTS-SIGN) guideline recommends that inhaled medications should only be prescribed by a clinician who is competent at assessing correct use of device.[4]

Choice of inhaler

The choice of an inhaler device is based on:-

- The patient's ability to use the device they have been prescribed. Patients using pMDIs must have excellent coordination of inspiration with inhaler activation to achieve optimum drug delivery to the lungs.[3]
- The patient's lifestyle and circumstances such as where and when the inhaler may be used. It is important that the device that is compatible with the patient's needs.[5]
- The patient's preference. If a patient does not like a device they will not use it. The inhaler needs to be acceptable to the patient, reliable, easy to clean and portable.
- The age of the patient – this will influence their physical and cognitive ability.[5] Very young children or elderly patients may have problems using certain devices. Manual dexterity should be considered and the aids provided. e.g. a spacer device or haleraid.
- Patients physical abilities, e.g. rheumatoid arthritis may impede a patient's ability to use certain inhaler devices. Dry powder devices or breath activated devices may be better than pMDI's for such patients.
- Whether the device can be used in an exacerbation to deliver larger doses e.g. a pMDI with a large volume spacer is as effective as a nebuliser at treating mild and moderate exacerbations of asthma.[4]
- Whether an inhaler indicates when it is running out of medication. Some inhalers have a dose counter to warn the patient to order more medication.
- The cost of the inhaler. The cost of inhalers should be considered but it is essential to remember that the cheapest device may not be the most cost-effective, if the patient cannot, or will not use it.
- Whether a combination inhaler is indicated. Combination inhalers can be helpful for patients who pay for their prescriptions or for patients who may not take inhaled steroids regularly.

Types of inhalers

There are several types of inhalers which include pressurised metered dose inhalers (pMDIs), breath activated pMDI's, dry powder inhalers and soft mist inhalers. More information on using these inhalers is given in the Inhaler devices opinion sheet http://www.pcrs-uk.org//opinions/inhaler_devices_final.pdf. Asthma UK have a useful demonstration site for most common inhalers http://www.asthma.org.uk/using_your_inhaler.html. Instructions are also provided in the Patient Information Leaflet provided with each device.

Table 1 gives the characteristics which might affect the choice inhaler device for different patients.

It is helpful to know what drugs are available in each device (see table 2).

Helpful aids/tips

- pMDIs with a spacer device and/or haleraid enable the activation of the device for patients with dexterity/co-ordination issues.
- Breath activated MDIs such as the Autohaler or Easybreathe are activated as the patient inhales and can be used by patients who have difficulty coordinating the pMDI. They are also useful for patients who may have problems with manual dexterity due to a cerebro-vascular accident and may only have the use of one hand.
- The turbo gripper can be used with the Turbohaler to aid the activation of the device for people with reduced or poor grip prior to inhalation/use.

Use of spacer devices

The effectiveness of pMDI's is improved if a spacer device is used. Spacers (or 'holding chambers') act as a reservoir and 'hold' the medication, allowing the patient sufficient time to breathe the medication thus achieving improved deposition into the lungs. Spacers are useful when:-

- The patient has poor co-ordination.
- High doses of inhaled corticosteroids

Table 1. Characteristics of types of inhaler device

Pressurised metered dose inhalers (pMDIs)	pMDIs require:- • Good co-ordination between activating the device & inhaling the drug. (This is the main reason for poor technique[2]) • Manual dexterity. • Slow inhalation.[6]
Breath activated pMDI's (BA pMDIs)	BA pMDIs:- • Can help overcome co-ordination problems as they do not require the patient to co-ordinate actuation of the device and inhalation of the drug.[5] • Require sufficient inspiratory flow to trigger the device.[6]
Dry powder inhalers (DPI)	DPIs:- • Can help overcome co-ordination problems. • Require some manual dexterity depending on the device used. • Require deep and hard inhalation for maximum drug deposition.[6]
Soft mist inhalers (SMI)	SMIs • May be easier to use than the Handihaler® for some patients. • Still require co-ordination when inhaling and actuating the device. • The aerosol is released over 1.5 seconds, so a slow gentle inhalation technique is important.

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Table 2. Some commonly used inhaler devices and drug formulations in the UK. Other less common devices available can be found in the British National Formulary.

	β2-agonist (short-acting)	β2-agonist (long-acting)	Steroid	Antimuscarinic (short-acting)	Antimuscarinic (long-acting)	Combination Long-acting β2/Steroid
pMDI	√	√	√	√	X	√
Easibreathe®	√	X	√	X	X	X
Turbohaler®	√	√	√	X	X	√
Diskhaler®	√	√	√	X	X	X
Accuhaler®	√	√	√	X	X	√
Handihaler®	X	X	X	X	√	X
Respimat ®	X	X	X	X	√	X
Easyhaler®	√	√	√	X	X	x
Clickhaler®	√	X	√	X	X	X
Novolizer®	√	X	√	X	X	X

are needed.

- Deposition of the drug in the mouth and throat is causing local side effects such as candidiasis or dysphonia from inhaled steroids. Spacers reduce the deposition in the mouth & oropharynx during inhalation and hence reduce these side effects.
- Delivering medication to young children or babies. In children 0-5 years, pMDI and spacer are the preferred method of delivery of β_2-agonists or inhaled steroids. A facemask is required until the child can breathe reproducibly using the spacer mouthpiece.[4]

The BTS/SIGN guidelines suggest the following when using and caring for spacers:-

- Using a spacer compatible with the pMDI being used.
- The drug should be delivered using repeated single actuations of the metered dose inhaler into the spacer, each followed by inhalation.
- There should be minimal delay between pMDI actuation and inhalation.
- Tidal breathing is as effective as single deep breaths.
- Spacers should be cleaned monthly (not weekly) by washing in detergent and allowing to dry. The mouthpiece should be wiped clean of detergent before use.
- Static charge may reduce drug delivery via plastic spacers, but metal and other antistatic spacers are not affected in this way.
- Plastic spacers should be replaced at least every 12 months but some may need changing more frequently.

Reviewing inhaler technique

- Inhaler devices may seem simple to use but are often used incorrectly by patients and health care professionals alike.[7]
- It is important to check that the patients can (and continue to) use their inhaler correctly because inadequate technique can be mistaken for lack of response to the drug. Inhalers should only be prescribed after a patient has received adequate training in the use of the device and has demonstrated a satisfactory technique.[8]
- Lack of placebo devices within clinical areas is often an issue for those wishing to instruct on inhaler technique. There is no evidence of a real risk of transmissible infections from placebo inhalers devices but infection control and the 'single patient use' status of devices is a problem. Encourage the patient to bring their own inhaler to clinic so their technique can be checked without using a placebo device. Placebo devices can be obtained from pharmaceutical companies if requested.
- A number of training devices are available to assess inhaler technique. The 2 Tone trainers teaches patients to breathe in at the correct speed when using a pMDI. Different tones are produced depending on how fast the air is being inhaled.[5]
- Many pharmacists undertake medicine review services and are trained in assessing inhaler technique. It is important to follow up patients if their inhaler device has been changed.

Patient Education

Patients should be given appropriate information about their disease and the medication including:-

1. Why the medication has been prescribed and how it can help their symptoms.
2. How to use the device. Diagrams and models may help, but ideally use a placebo device to demonstrate the technique, and then check if the patient can use the inhaler.
3. When to use it. (Frequency and use of medication should be included in an action plan).
4. The speed of onset of the drug, how long the effects last and expected results (less breath less, less exacerbations and reduced need for short acting relievers).
5. Possible side effects, and any concerns the patient may have.
6. The importance of rinsing the mouth and throat after using a steroid inhaler to minimise side effects such as oral candidiasis or dysphonia.
7. What to do if treatment does not control symptoms.
8. Safe storage of the device.
9. How to know when an inhaler is empty (some devices include dose counters).
10. How to clean the device.

Organisational issues

It is essential that knowledge about the treatment and inhalers is reinforced and this should be incorporated into routine reviews undertaken by trained members of the practice team. Health care assistants may extend their roles to include checking inhaler techniques, but professionals delegating this task have a legal responsibility to ensure that the person delivering the patient education is competent to do so. This equally applies to doctors delegating roles to nurses and nurses delegating to other members of the multi-disciplinary team.

Conclusion

There are a number of inhaler devices available. It is important that inhaler technique assessment forms part of respiratory consultations and reviews. The importance of education and training in inhaler device technique cannot be over-emphasised. The availability of unbiased, evidence based training should be a pre-requisite of undertaking or delegating this task. Refer to a specialist professional for more advice if needed.

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