NON-ADHERENCE IN SEVERE ASTHMA – A PROBLEM OF MEASUREMENT

Mark Orchard, David Alderson

Cogentia, Cambridge, UK Contact the authors via cogentia.co.uk/contact

BACKGROUND

- ▶ The economic impact of poorly controlled asthma is substantial. ¹ Some of this which is due to poor adherence is preventable. Suboptimal adherence to inhaled corticosteroids is the most common reason for treatment failure in asthma.²
- There are multiple possible approaches to improving a patient's adherence (and by implication their health outcomes). However a key issue is being able to accurately measure adherence – to be able to (1) identify poor adherence, and then (2) improve it, but also being able to (3) rule it out in stepping up treatment.
- Severe asthma can only be diagnosed after contributory factors, including adherence, have been addressed. Accurate assessment of adherence is difficult in clinical practice with patient self-report offering a simple, inexpensive method of assessing adherence, but typically over-estimating it.³ Even other objective or direct measures such as Rx refills, secondary database analysis and biochemical measures or markers have drawbacks and are not well suited to Asthma.
- The Global Initiative for Asthma 2020 strategy states that it is important to distinguish between severe asthma and asthma that is uncontrolled (e.g. due to poor adherence).⁴
- Without an accurate measure treatment cannot be optimised, the complex underlying reasons for poor compliance addressed or an accurate diagnosis of severe asthma made.
- Smartinhalers may provide the only objective way of measuring true nonadherence, and by association truly refractory asthma.⁵ Adherence is not a one off event and Smartinhalers could offer the opportunity for ongoing measurement.
- There has not been a full Health Technology Assessment of Smartinhalers, and the framework to evaluate smart inhalers is not established.
- A 2017 NICE Medtech innovation briefing covered a range of potential places in therapy but not value derived by being the only accurate measurement of adherence in severe asthma.⁶
- The Centre for Evidence-Based Medicine published a risks and considerations document relating to asthma and COVID-19, describing how smartinhalers may allow remote monitoring of compliance.⁷

OBJECTIVE

This poster aims to explore the problem posed by the difficulty of measuring non-adherence in asthma, how reliable measurement is the key starting point to optimal treatment and that smart inhalers can play an important part in that solution

METHODS

- The review included both the scale of the problem non-adherence poses in asthma, and the current techniques used to measure adherence.
- A targeted literature review was conducted in standard, recommended search engines – including Medline, Embase, Cochrane and the Health Technology Assessment (HTA) database.
- This was combined with a range of case studies and other articles.
- This was supplemented by a 12 interviews with respiratory clinicians
- Following the review, and analysis, themes were extracted on the role that a Smartinhaler could play and deliver value to the patient and health system

RESULTS

- Studies reviewed identified a clear disparity between existing measures of adherence, and the objective underlying adherence. There is no reliable and accurate measure outside of a Smartinhaler. For example, Jochmann et al (2017) found there is no correlation between electronic monitoring and records for uptake of prescription.⁵ Figure 3.
- Understanding the extent of non-adherence is critical to interventions and improvement (four adult studies concluded that a 25% increase in adherence was associated with an approximately 10% reduction in severe exacerbations)⁸
- Identifying non adherence is essential in diagnosing severe asthma.
- The key places where a basic Smartinhaler was seen as needed were prebiologic in severe asthma, in paediatric secondary asthma care, and post-COPD hospitalisation due to an exacerbation. In all settings over 90% of surveyed clinicians would use them if available.
- Given the expense of Asthma Biologics, and the cost of exacerbations, and the issues with over treating, there was a clear consensus from GINA that objective assessment of adherence is needed⁴ Figure 1
- The number of patients stepped up to expensive biologic treatments who are poor adherers is high as demonstrated in a number of studies.⁹ Figure 2.

Figure 1 GINA cycle of asthma management⁴



Figure 2 EMD assessment of adherence in patients eligible for novel asthma treatment (biologics or thermoplasty)



hma medication (adjust up or down) Education & skills training

There was consensus amongst the clinicians that 'it is not possible to optimally manage severe asthma without the availability of objective monitoring of adherence'.

As a diagnostic tool, it was seen as providing cost savings in reducing unnecessary referrals (from primary care), in reducing unnecessary novel therapy use , and in reducing resource use by more targeted interventions and improvement of adherence.

nfirmation of diagnosis if necessary symptom control & modifiable risk factors including lung function)

nhaler technique & adherence Patient preference and goals

Treatment of modifiable factors and Non-pharmacological therapies

Figure 3 Detection of nonadherence by subjective methods in 45 difficult asthma patients with objective data from the electronic monitoring device⁹



DISCUSSION

- Smartinhaler.
- economic benefits come from a range of elements:
 - Improved assessment and management of patient
 - efficiency)

 - Reduced unnecessary referrals
 - outcomes resulting from improved adherence
 - COVID-19 pandemic
- explored in more detail
- through direct impact on outcomes, behaviour and adherence.

CONCLUSIONS

- optimising asthma management
- in improving remote and ongoing care
- misallocated
- to be demonstrated and quantified

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The potential value of Smartinhalers is significant, and has been discussed in many contexts. However the value of providing a tool for assessing nonadherence has not been articulated fully for these devices. It is clear that non-adherence and measuring it is a significant issue in asthma, and is essential within the guidelines, but cannot be done effectively without an objective measure such as use of a

There would seem to be multiple ways that a Smartinhaler delivers value as a measurement device in both the severe asthma stage, and prior to referral. These

• Improved clinical interactions, and accuracy of measurements. (Consultation

• Optimising lower cost therapy prior to biologics, and potential reduced Rx

Reduced exacerbations and resource use / hospitalisations due to improved

• Ability to monitor patients remotely – this is particularly valuable in during the

The value of Smartinhalers will be different within the different settings. But using them at step 5 and prior to biologics to confirm adherence should be beneficial and

There are multiple other ways in which features of a Smartinhaler can create value

Addressing non-adherence and measuring it in an objective way is essential in asthma management, to inform approach to treatment pathway

Poor adherence leads to poor outcomes and with the shift towards expensive biological treatments, the ability to measure and manage adherence is at the core of

Furthermore, given the pressure on health systems posed by COVID-19, the role of remote monitoring in asthma is increasingly important and smart inhalers play a role

One consequence of an inappropriate diagnosis of severe or 'treatment-resistant' asthma in non-adherent patients is that newer expensive therapies will be

Well designed, real-life prospective studies with consistent and standardised measures of adherence are required to explore the true scale to which nonadherence is a contributory factor to negative outcomes in severe asthma

There is value and benefit in an accurate measurement of adherence, which needs

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