DOI: 10.1002/ppul.26471

CLINICAL CORRESPONDENCE

PEDIATRIC PULMONOLOGY WILEY

Clinical correspondence: Usage of a novel inhaler device for the management of asthma in children with special needs

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To the Editor,

Asthma is prevalent among children in India (incidence rate ~7.9%), is the third most common reason for children being hospitalized and accounts for more than 10 million "lost school days" annually.[1]

An overlap between asthma, attention-deficit/hyperactivity disorder (ADHD), and/or autism spectrum disorder (ASD) has been reported in children.[2] Kaas et al. found in a systematic review that out of 25 asthma-ADHD studies, 17 studies revealed a significant positive association. Asthma was found to be more common in children with ASD; 21.6% of children with ASD were diagnosed with concomitant asthma, of which 49.5% reported an acute exacerbation over 12 months. Comorbidities with asthma are known to be associated with difficult clinical management, increased economic burden, and complex health outcomes. ASD is typically characterized by severe functional impairment, poor social interaction, and repetitive or stereotypical behavior, while ADHD is associated with functional impairment, poor cognitive development, and hyperactive-impulsive responses.[3,4] Hence, the presence of ADHD/ASD with asthma is challenging for physicians to plan appropriate treatment, as they impact the patient's adherence to medication.

Inhalation therapy is the key to effective asthma management. Delivering inhaled medications directly to the lungs has the advantage of the drug being delivered more effectively to the airways along with reduced systemic adverse effects.[5] Using the right device and considering patient preference is crucial for adherence, leading to better symptom control and improved quality of life for patients. Pressurized metered-dose inhalers (pMDIs) with spacers and dry powder inhalers are the most commonly used devices in children with asthma but have their individual limitations. Breath-actuated inhaler (BAI) is a novel device that can address some of these limitations.[5] A BAI detects an inhalation attempt through the actuator and mechanically delivers the drug in synchronization with the patient's breath. This eliminates the need for actuating the inhaler manually, thus overcoming technical dependency.[5]

We hereby describe the effectiveness of BAI in the management of asthma in three such pediatric patients aged 10–13 years who presented with recurrent asthma exacerbations and poorly controlled symptoms. Two of them had severe ADHD while one was a child with ASD with ADHD. The first child had ADHD with a predominantly hyperactive impulsive presentation, mild to moderate functional impairment, and was undergoing treatment with behavior therapy and methylphenidate. The second child also had ADHD with a predominantly hyperactive impulsive presentation, and mild functional impairment, and was undergoing treatment with behavior therapy. The third child had ASD with a combined hyperactive impulsive presentation, additional features of inattention, mild to moderate functional impairment, and was undergoing treatment with behavior therapy and methylphenidate. All three children attended a special school and were responding well to therapy. For their asthma management, one child was previously treated with budesonide (100 µg) twice a day with a pMDI with spacer, while the other two children were treated with fluticasone (125 µg) plus salmeterol (25 µg) pMDI with spacer, two puffs twice a day. All three patients had significantly low scores on the asthma control test. On the evaluation of the technique of the drug delivery, all three patients were found to have difficulties in taking a minimum of six breaths with the pMDI with a spacer. All children were thereafter started on inhaled fluticasone (125 µg) plus salmeterol (25 µg) via BAI (Synchro-breathe®) along with levosalbutamol BAI (Levolin®) to be used as a reliever after adequate coaching of both the parents and children in the right technique of using the new device. Following the change to BAI replacing MDI with spacer, all three patients were followed up at 2-week, 1-month, and 2-month intervals. All three patients were found to be well controlled in their asthma control test scores on the three follow-ups with no need for reliever use in the past 3 months. On administering a patient satisfaction questionnaire, the parents reported that BAI was easier to use, required lesser effort for breathing, was easier to maintain, and the children had a better understanding of using the device. Our observation highlights the importance of using the appropriate technique and device in the management of asthma, especially in children with special needs. Parental permission was obtained before the inclusion of the children's information in this report.

In our case series, we demonstrate the key advantage of BAI which includes overcoming the challenge of a child needing to take at least 6–10 breaths through a spacer following the actuation of the device. Furthermore, BAI requires a low inspiratory flow rate for breath actuation making it easier for children to use. Decreased oropharyngeal deposition and increased lung deposition have also been noted with BAIs as the drug is released at a lower velocity. BAI is compact, portable, obviates the need for a spacer, and is easy to clean and maintain.[5] Children with ADHD and ASD can often struggle with inhaler device usage due to associated sensory issues and difficulties in coordination, leading to poor asthma control. We found that our patients demonstrated significant improvement in asthma control, probably due to the technical ease of using a BAI, with a lesser need for time, cooperation, and coordination.

There is a need for more studies to be conducted on newer inhalation devices for children with special needs. Guidelines should be established to determine which device is best suited for specific patient groups, taking into account factors such as patient preference and ease of use. Based on our experience with these three children with special healthcare needs, we recommend BAIs to be considered in the management of asthma in children with ASD and ADHD.

AUTHOR CONTRIBUTION

K. R. Bharath Kumar Reddy: Investigation; funding acquisition; conceptualization; writing—original draft; writing—review and editing; visualization; validation; methodology; software; formal analysis; project administration; resources; supervision; data curation.

CONFLICT OF INTEREST STATEMENT

The author declares no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this case series are available from the corresponding author upon reasonable request. However, due to patient confidentiality and privacy concerns, some data may be restricted and cannot be shared publicly.

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