

# Clinical Phenotypes of Severe Asthma in Children

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With recent advance in asthma treatment, most of childhood asthma can be controlled with appropriate use of anti-inflammatory drugs, mainly inhaled corticosteroids. However, about 5–10% of children with asthma remained uncontrolled. There are three types of poor controlled asthma, 1) untreated/undertreated asthma, 2) problematic severe asthma with modifiable factors such as poor adherence, untreated co-morbid diseases and poor environment (allergens/air pollution) and 3) true therapy-resistant severe asthma. A step-wise approach including detailed assessment of clinical history, adherence and environment by multidisciplinary team can determine the types and factors that impair asthma control. In this presentation, a practical approach for each type will be discussed.

Untreated/undertreated asthma is not uncommon. Both physicians who do not understand current high standards of asthma control and patients who are “acclimated” to chronic asthma symptoms are responsible for this problem. In this aspect, school can be a good “tool” to discover this type of children since school absence and exercise-induced symptoms can be a clue. We developed a web program that help teachers identify problematic asthma kids at school. In Japan, the government recommends schools to require a standardized instruction form from home doctors for problematic asthma children. We then developed a web program to support the doctors fill out the form for “right” instruction to school and help them acknowledge guideline-based treatment.

Poor adherence is often “hidden” by the patients, even unrecognized by themselves. So that objective assessment of adherence is important, and we developed an instrument, “Pediatric Asthma Adherence Questionnaire; PAAQ. The PAAQ discriminated poor adherence and the score correlated well with the physicians’ ratings of adherence. It also helped identify barriers to hinder adherence, including lack of knowledge, decreased willingness to treatment, poor self-efficacy and neurodevelopmental disorders.

Omalizumab and mepolizumab are licensed for children with treatment-resistant severe asthma. Evidence

of efficacy and safety of the biologics has been established. These drugs not only prevent exacerbation but also improve quality of life of the patients. Dupilumab and other new biologics will also be licensed for children soon. However, biomarkers predicting responses to treatment are lacking. Further study to identify endotypes of severe asthma for the use of biologics are necessary.