



Grand Rounds Expert Opinion

[Patient Name]

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About Dr. Andrew MacGinnitie

Dr. Andrew MacGinnitie is an allergist-immunologist in Boston, Massachusetts. He received both his medical degree and doctorate degree from the University of Chicago and has been in practice for 17 years. Dr. MacGinnitie specializes in the diagnosis and treatment of food allergies, hereditary angioedema, asthma, allergic rhinitis, urticaria, drug allergies, and eczema.

Institutional Affiliation

Division of Immunology at Boston Children's Hospital
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Education

University of Chicago, Pritzker School of Medicine

Residency

Boston Children's Hospital

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Allergy and Immunology, Boston Children's Hospital

Awards

Board Certification in Pediatrics
Board Certification in Allergy & Immunology
Glaxo Smith Kline Allergy Fellowship

Publications

Use of ecallantide in pediatric hereditary angioedema. Macginnitie, A. J.,Davis-Lorton,

M.,Stolz, L. E.,Tachdjian, R.; Pediatrics. 2013 Aug. Outcomes after ecallantide treatment of laryngeal hereditary angioedema attacks. Sheffer, A. L.,Macginnitie, A.

J.,Campion, M.,Stolz, L. E.,Pullman, W. E.; Ann. Allergy Asthma Immunol.. 2013 Mar. Analysis of hereditary angioedema attacks requiring a second dose of ecallantide. Li, H.

H.,Campion, M.,Craig, T. J.,Soteres, D. F.,Riedl, M.,Lumry, W. R.,Macginnitie, A. J.,Shea, E. P.,Bernstein, J. A.; Ann. Allergy Asthma Immunol.. 2013 Mar

Summary of Patient Medical History

Thank you for allowing me to review your daughter's case and provide my opinion. Before answering your specific questions, please allow me to summarize what I have learned from reviewing her records.

Kathleen is a generally healthy girl who was recently diagnosed with asthma and allergies. As a toddler, she had multiple colds and several ear infections. The colds often were associated with coughing, but when her lungs were listened to at the pediatrician's office, no wheezing was noted. She also developed a cough, congestion and sneezing in the spring, which her pediatrician thought were due to allergies. She was started on Claritin (loratadine), which is a medication used to treat allergies. This past spring, she caught a cold and developed some wheezing and decreased oxygen levels in the blood. She went to see the pediatrician, who gave her a breathing treatment without much benefit and sent her to the Emergency Department. She was admitted to the hospital for two days and was treated with albuterol, a medication that is used when patients have wheezing. Following discharge, she was taken to see an allergy doctor. The allergy doctor did skin testing for allergies and found that she has allergies to tree pollen, a specific type of mold, and dust mites. He also thought, based on reports that Kathleen develops wheezing when she has a cold, and frequently coughs at night, that she has mild persistent asthma. Therefore, he started Kathleen on Flovent (which is a steroid medication in an inhaler form that is used to prevent asthma attacks), Singular (which is a medication used in patients with asthma and allergies), Zyrtec (an allergy medication) and Albuterol (the medication that helps stop wheezing). You are concerned with the number of medications she is taking and want to make sure that she actually needs all these medications. You also want to know what the side effects of the medications are, and whether there are any alternative therapies available for her.

Background Information

Before I respond to your specific questions, I'd like to provide you with a bit of background information about asthma. Although you may be familiar with some of what I'm going to tell you, I feel that the information will be helpful in better understanding the recommendations that I make. Asthma is a chronic condition which causes the airways to become inflamed, making it difficult to breathe. Several factors contribute to asthma including genetics, irritating substances in the air (like cigarette smoke, cold air, or pollen), infections (even common colds), and the body's own immune system. Asthma can cause people to feel short of breath, chest tightness, cough, or wheeze (a high-pitched, whistling sound when you breathe out). Asthma can have a wide range of severity: some people only have symptoms a few times a year while other people have symptoms every day of their lives. Generally, asthma is not diagnosed in children under 2 years of age. This is because infants and young children can frequently develop a wheeze when they have a cold, and then never wheeze again. However, when children develop a pattern of symptoms, like cough and wheezing, that respond to asthma medications (like albuterol or ProAir), or if their symptoms worsen when they are exposed to allergens, like mold or dust, then we diagnose them with asthma.

Patient's Questions

Does Kathleen really need to be on such aggressive therapy? She never seems to be sick when she is with me, and I want to make sure that her treatment is appropriate.

Let me start by saying that asthma in preschool children is a difficult illness to manage. Most children this age, like Kathleen, don't have symptoms on a regular basis so it can be hard to judge how much medicine they need. Rather, they typically develop symptoms when they get a viral illness or are exposed to things they are allergic to, such as dust or mold. In Kathleen's case, she had to be hospitalized recently in the setting of an illness. While we want to avoid exacerbations, particularly severe ones like Kathleen's that required admission to the hospital, we also don't want to over treat children as these medications often have side effects. Prior to this episode where she required admission to the hospital, it seems like she would cough when she got viral illnesses (ie colds), but she never had wheezing and never required treatment with albuterol or other asthma medicines. I'll talk more about this below, but I think there is some room to back off from her current treatment plan. I don't think her current medical regimen is wrong; however, given her history, there is a range of possible treatments and something less aggressive might work just as well.

In your opinion, is her treatment course based more on objective data, such as labs?

Much of medicine — especially the treatment of allergies and asthma — is still as much an art as it is a science. However, there is some objective data about Kathleen that can help guide our treatment plan. First, her oxygen saturation (the amount of oxygen in her blood) was lower than normal with her recent illness and hospitalization. This is typical of asthma and indicates that at that time, she was moderately ill and required treatment in the hospital. Second, skin testing for environmental allergies (which is the type of testing that Kathleen has had) is the accepted standard for diagnosing this type of allergy and she was positive to several things. There are also blood tests that can test for allergies, but these are no better than skin testing and actually may not be quite accurate as the skin testing. The presence of allergies can not only trigger asthma, but they also help to identify kids who may have more trouble with their asthma as they get older. As she gets older, Kathleen will be able to do more objective tests of her lung function (called spirometry) which will help in managing her asthma. Unfortunately, the youngest age kids can do these tests is 5 or 6.

Do you agree with her current treatment plan?

As I said, treatment of a preschool child who wheezes with viral infections (like colds) is challenging. Given that she has only had one episode of documented wheezing, albeit a severe one requiring hospitalization, I think it might be possible to cut back a bit on her treatment without greatly increasing the risk of another severe asthma exacerbation. We divide medications for asthma into 2 categories: controllers and relievers. Controllers are taken every day to prevent symptoms. Controllers include medicines like inhaled steroids (e.g. Flovent) and leukotriene modifiers (e.g. Singulair); leukotrienes are molecules that cause inflammation in the lungs that makes asthma worse. These medications help decrease inflammation in the lungs that is thought to be the underlying cause of asthma. Relievers, which are medications like albuterol, treat the symptoms of asthma like coughing and wheezing and are only taken when needed. All patients with asthma need to have one of these reliever inhalers available at all times in case they develop symptoms.

Asthma can be classified by severity based on how frequently patients have symptoms, such as cough or trouble breathing. Based on her medical records, Kathleen has mild persistent asthma. Mild persistent asthma means that patients have symptoms (such as cough or difficulty breathing) more than two times a week, but not daily, and wake up with symptoms 3-4 nights per month. Patients thought to have mild persistent asthma, like Kathleen, are typically started on one controller, usually a low dose inhaled corticosteroid like Flovent (she is on a low dose). However, Kathleen is on two controllers, so it would be reasonable to stop the Singulair and see if she continues to do well. Of course, it will be very important to see how she does over the next 3-6 months, particularly in the Fall when viral illnesses are more common. If she continues to do well, which I'd define as minimal symptoms and no more visits to the Emergency Department or hospital, her Flovent could be decreased to once a day in 6 months or so and perhaps even stopped completely next Spring. Of course, if she has more symptoms or further exacerbations, she may need to continue the Flovent, or even restart the Singulair. I'd recommend continuing to use either Zyrtec or Claritin for allergy symptoms although these could be used just as needed if she does well. She should continue to have albuterol available to use if she were to develop a wheeze or cough.

What are the side effects of her current medications?

Inhaled steroids, such as Flovent, can cause a number of side effects, the most concerning of which is decreased growth. The typical child will grow about 1 cm (a little less than 1/2 inch) less the first year they are on inhaled steroids than if they were not taking inhaled steroids. It seems this effect wears off, but with prolonged use, a child's final adult height may be 1 cm less than it would have been had they not been taking inhaled steroids. This is not a lot, but we try to use the lowest doses necessary. Inhaled steroids can also cause some infections of the mouth and throat (thrush, which is a yeast infection) but this can be avoided by rinsing the mouth and/ or brushing teeth after using the Flovent. Rarer side effects, including decreased production of the body's own steroids, glaucoma (which is increased pressure within the eye) and decreased bone

density (such as seen in osteoporosis) almost never occur in children, especially at the low doses that Kathleen is taking.

Singulair can cause behavioral problems like increased aggression, overall crankiness, and nightmares in a very small percentage (probably less than 5%) of children taking it. These symptoms typically go away once the medication is stopped. Albuterol can make children hyper, but this wears off quite quickly, usually within a few hours. Claritin and Zyrtec typically don't have many side effects, although Zyrtec can cause increased sleepiness in a small percentage of children.

Are there alternatives to her current treatment plan?

I think with a recent hospitalization for asthma, Kathleen needs to be on a daily controller medicine to help keep this under control. Of these daily controller medications, inhaled steroids, like Flovent, have been shown in scientific studies to most effectively control asthma symptoms, so I'd recommend continuing the Flovent at the current dose, but considering stopping the Singulair. If Kathleen does well, you and her doctor can consider decreasing the dose and eventually stopping the Flovent. It is possible to stop the Flovent and continue the Singulair, but I think that is likely to be much less effective way of controlling her symptoms. In addition to these medicines, I think it will be very important to address possible environmental triggers that make her symptoms worse.

Are there any environmental changes that can be made that can help her symptoms? Yes, definitely. The most important trigger to avoid is all tobacco smoke. The one thing that can help increase the odds that Kathleen will "outgrow" her asthma as she gets older is avoiding tobacco smoke. My understanding is that neither you or her mother smokes and that is great. However, she should avoid spending time in rooms where people smoke and around people who have recently smoked. Even if she is around people who have smoked outside and then come back inside, their hair and clothes will have particles of smoke on them and this can worsen her asthma. In addition to avoiding tobacco smoke, it is important to minimize exposure to the things that Kathleen is allergic to, which includes tree pollen, dust mites and mold. For molds, any area of visible mold in basements or bathrooms should be cleaned with a dilute bleach solution and a dehumidifier used in musty or damp areas. Exhaust fans in bathrooms will help keep these dry. However, expensive mold testing and remediation plans are generally not necessary. In order to control exposure to dust mites, I recommend getting dust mite impermeable covers for all bedding and washing sheets, blankets, and pillowcases in hot water weekly. This should be done at both parents' houses. Additionally, the number of stuffed animals should be kept to a minimum, and carpeting removed or vacuumed regularly. Finally, tree pollen exposure can be minimized by keeping windows closed and air conditioning on during the pollen season, as well as changing clothes and bathing after she spends time playing outside.

Recommendations for the Patient

Thank you for allowing me to participate in Kathleen's care. In summary:

- Minimize environmental exposure to tobacco smoke, dust mite, mold and tree pollen.
- Discuss with doctors stopping the Singulair to see how Kathleen does with Flovent alone as her asthma controller medicine.
- Use albuterol as needed to relieve acute symptoms of coughing and wheezing.
- Follow her breathing closely over time to see if Flovent can be decreased or eventually stopped.
- Consider lung function testing once she is 5 or 6. I hope that you find these recommendations helpful and that they serve as the basis for a productive conversation with Kathleen's doctors. I wish you good fortune with Kathleen's health.

References for the Patient

The American Academy of Allergy, Asthma and Immunology website has good information on allergies and asthma.

www.aaaai.org

References for the Treating Physician

The NHLBI guidelines are the best source for diagnosis and treatment of asthma.

<http://www.nhlbi.nih.gov/health-pro/guidelines/current/asthma-guidelines>