

Breath of Fresh Air

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Information, news and advice for improving asthma well-being

Summer 2013

Asthma and Binkies — Really?

Did you happen to catch the report that the children of parents who clean their baby's pacifier at least some of the time by licking it clean in their own mouths have less allergy than the children of parents who clean the pacifier exclusively by washing it with tap water or sterilizing it in boiling water before returning it to the child's mouth? Could it be that a parent's germs are good for preventing eczema and asthma? Who thought to make that observation ... and why?

Researchers in allergy, gastroenterology, and infectious diseases/microbiology at the University of Gothenburg in Sweden conducted this study among just over 100 mother/baby pairs. (It has been published in the medical journal, *Pediatrics*, and you can find it on-line at <http://pediatrics.aappublications.org/content/131/6/e1829.full.html>). The authors knew of the evidence that when the normal germs that live in the intestines are limited in variety, children are more prone to develop allergies. Among the evidence is the observation that children who are delivered vaginally – and exposed at birth to their

mother's normal vaginal and possibly fecal germs – are less likely to go on to develop allergies than babies delivered by cesarean section in a sterile operating room. The researchers wondered about the potential influence of the normal germs that live in the mouth, and whether by sharing their saliva, parents might expose their babies to a

broader array of normal bacteria. The thinking is that if a child's immune system is exposed to many different types of bacteria at a young age, it will come to accept these foreign substances

(antigens) as “friend, not foe” and not attack them using our immune defenses. Exposure to a broad variety of germs appears to “teach” the developing immune system to accept not only these antigens, but also the harmless ones that we identify as allergens, such as cat or dog dander, dust mites, or grass pollens.



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In this study from Sweden, most (80%) of the children had at least one parent who was allergic, making it more likely that at least some of the babies would develop allergy. Evidence for allergic disease in the infants was assessed by a pediatrician, based on evidence for sensitization to common allergens on blood testing and the development of asthma or the allergic skin rash, eczema. Their finding? When parents cleaned the pacifier by sucking it, their children were less likely to have eczema and asthma at age 18 months; the odds were reduced by more than 50%. When evaluated again at 36 months of age, the children of parents who cleaned the pacifiers by sucking them still had less eczema, although the differences in rates of asthma and of sensitization to common allergens was no different between the groups.

Two other findings from this study: first, the number of respiratory infections during the first 6 months of life as reported by the parents did not differ between groups; and second, analysis of the babies' saliva at 4 months, using a sophisticated technique to analyze the presence and variety of bacterial DNA, showed clear differences between children whose parents did and did not use the sucking technique to clean off their baby's pacifier.

This study taken alone proves very little, and it certainly cannot be taken as a recommendation for preferred child-rearing techniques. But it does add to the growing body of evidence that "too clean" (that is, germ free) may have an undesirable effect on our immune systems, contributing to the ever-increasing prevalence of asthma and allergies in our society. This concept is referred to broadly as the "hygiene hypothesis," which suggests that reduced exposure of very young children to germs is a risk factor for their development of allergic disease. Other observations like this study of "binkies" provide additional circumstantial evidence about the yin-yang of germs and allergies. For instance, going to daycare at an early age, having older siblings, and growing up in close contact with farm animals all have been

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Rebirth of *Breath of Fresh Air*

Between 1995 and 2012, Partners Asthma Center printed and distributed 44 issues of its asthma educational newsletter, *Breath of Fresh Air*. As our mailing list increased, so did the cost of printing and mailing the hard-copy of our newsletter. With this first electronic version, *Breath of Fresh Air* is reborn at virtually no cost (to us or to the environment). The articles published here can also be found at our asthma blog: www.pacasthma.blogspot.com. We would value your feedback at asthma@partners.org.

Bidding a Final Farewell to CFC Inhalers

Asthma sufferers may find themselves with dual loyalties. On the one hand, they too want to protect the environment for their own health and for the sake of future generations inhabiting this planet. On the other hand, they want to maintain good asthma control so that they can breathe. Although there shouldn't be any conflict between these two goals, you may have sensed that there has been ever since pharmaceutical manufacturers started eliminating asthma medications using chlorofluorocarbons (CFCs) to propel the mist from metered-dose inhalers. CFCs are harmful to the environment. Together with similar molecules formerly used in refrigeration and air conditioning, CFCs interact with gases high in the atmosphere above us, depleting ozone from the stratosphere. Enlarging ozone holes in the atmosphere and the role of CFCs in causing their formation were discovered by scientists in the 1980s, and by 1989 countries around the world agreed to stop manufacture and sale of most CFCs. Slowly we have seen elimination of CFCs as propellants for our metered-dose inhalers.

First came albuterol. Albuterol-CFC was replaced by albuterol-HFA, which used an environmentally-safer propellant called hydrofluoroalkane. Initially, one pharmaceutical company released its albuterol-HFA inhaler, then came others. We now have three: ProAir-HFA, Proventil-HFA, and Ventolin-HFA. It was not a happy transition. Because there is no generic albuterol-HFA,

the cost of these quick-relief medications jumped dramatically. There was the widespread perception that the new inhalers did not work as well as the old albuterol-CFC inhalers, although careful scientific comparisons between the old and new could find no differences. And finally, the new medication has a tendency to stick where the metal canister sits in plastic holder, clogging the mechanism and requiring periodic cleaning of the device so that the medication can be released freely again.

Since then, other asthma medications have been released as metered-dose inhalers with HFA propellants, including the steroids beclomethasone (formerly Beclovent and Vancril) as Qvar-HFA, fluticasone as Flovent-HFA, and newest among them, ciclesonide, as Alvesco-HFA. However, not all medications made the transition to the new propellant. The inhaled steroids, triamcinolone (Azmacort) and flunisolide (Aerobid), simply disappeared from the market, as did the once widely used anti-inflammatory medication, cromolyn (Intal). Other manufacturers released their asthma medications not as metered-dose inhalers at all but in a dry-powder formulation. The inhaled steroids budesonide (Pulmicort), fluticasone (Flovent), and mometasone (Asmanex) are available as multi-dose dry-powder inhalers.

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This summer marks the end of the road for CFC-driven inhalers. The last two are both quick-acting bronchodilators -- albuterol plus ipratropium in the Combivent inhaler (more often used to treat COPD than asthma) and pirbuterol in the Maxair Autohaler. Maxair will simply be withdrawn from the market; Combivent is being released using a novel delivery system, called a "soft mist" inhaler (Combivent Respimat). This latter new system is a tribute to the inventiveness of pharmaceutical manufacturers as they work to make inhaled medications available in ways that are both effective and safe for our environment.

The silver lining in all of this is that globally the amount of CFC-type chemicals in the atmosphere decreased by approximately 10% between 1994 and 2008. It is predicted that the ozone hole over the Antarctic will decrease in size by 2015 and may completely recover by 2050. We care about the protective ozone layer in our planet's atmosphere because its depletion is associated with increased exposure to ultraviolet light (UVB) on the planet's surface, increasing our risk of skin cancers and cataracts and potentially causing damage to crops and sea life. With the help of scientific expertise, global cooperation, and some flexibility on our parts, it may be possible to "have our cake and eat it too," or in this case, to protect "spaceship earth" and breathe freely too.

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shown to lessen one's chances of developing asthma.

Still ahead is the research that will unravel the exact mechanisms by which the immune system is directed away from allergies when exposed to a broad array of harmless germs at a young age. The potential impact of this understanding is great. Some day one might be able

to introduce benign germs of the right type in a way -- at the right age, in the right amount, and over the right period of time -- such that one could help prevent susceptible children from developing allergy and asthma. That is the "golden ring" promised by advocates of the hygiene hypothesis.

Breath of Fresh Air

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