

As you know, these articles started with Kentucky Youth Soccer to cover the topic of nutrition. From here, it has evolved into discussions involving certain medical conditions, as well. I have been asked by many people within your organization to address asthma. It is a problem within youth sports, and soccer is no different. I am going to talk about asthma, but I am also going to show you how it is related to nutrition. The next series of articles will outline asthma, nutrition, and supplements. My job is to call upon my experience as a physician and surgeon, my review of the pertinent literature, and utilize the brain power of my colleagues to provide the best information possible to help you live healthier lives. Literally, thousands of pages of medical literature, lay press, and other sources of information will be read, and then I will condense and simplify the information, so I can present it to you and your families in a concise, useful format. I have enlisted the knowledge and experience of Dr. Jamshed Kanga, M.D., an esteemed colleague and pediatric pulmonologist at the University of Kentucky. His interview at the end of this article will provide insightful information concerning soccer players who have asthma.

Each one of these subjects in their own right (asthma, nutrition, supplements), represents a great deal of study, but after looking into each topic, I see common threads which can be interwoven to give readers a complete story.

Let's start with asthma.

Recent data suggests there are 22 million people in the United States affected by this disease. Chronic means long term. Acute means now, urgent, or an emergency. Asthma has both components. It is a chronic disease of the airway, resulting from inflammation and the resultant problems associated with the inflammatory state. If you think of the airway as an upside down tree, you will get the picture. The main trunk is the trachea. It branches into a left and right bronchus. Sometimes asthma is called bronchial asthma, and now you see why. From there, the branches become smaller, into bronchioles, which supply the alveoli of the lungs. At this level, oxygen is exchanged for carbon dioxide. Essentially, this is breathing.

In many instances, consider the human body composed of many tubular structures, all of which have a specific function. Generally speaking, the tubes, or in this case the bronchi and bronchioles are surrounded by muscle. These muscles have receptor sites, called Beta Receptors. When the Beta Receptors are stimulated, this causes the muscle to relax, and thus dilate the airway. Remember this terminology when you read Dr. Kanga's interview. When a person has asthma, these muscles surrounding the airway begin to contract and narrow the airway. You may also see as a result, fluid and mucus accumulate inside the airway, which add to the problem. Think of it this way, put a straw in your mouth and pinch your nose closed. Breathe through the straw. Now, pinch the straw closed. This is what a person with asthma may feel like during an acute attack. Air hunger, shortness of breath, referred to as dyspnea is what results. Not too comfortable is it? The inhalers used will relax the muscle surrounding the airway, thus dilating the air passage, so the person can breathe. This is why they are called Beta Agonists. Components of this disease include obstruction, inflammation, and irritability of the airway.

Some literature suggests different types of asthma, but I won't get into this too much. The one which needs to be mentioned is termed "Exercise Induced Asthma." Normally, we take in air through our nasal passages, which warm the air introduced to our airway. If patients breathe through their mouths, colder, drier air enters the airway, thus triggering the acute response. We will discuss this term further in Dr. Kanga's interview.

Now, let's starting getting into some other areas of discussion. We will begin to relate asthma and other conditions to our gastro-intestinal tracts. I firmly believe we as a nation are consuming some of the worst foods seen in decades. Our fast food consumption is remarkable. We don't in enough fruits and vegetables. I know you get tired of hearing it, but it is true. We must work to achieve nutritional balance. I have said it many times: protein, carbohydrates, and fats must be consumed in a balanced, nutritional way to minimize health problems and maximize performance, and I don't just mean on the field of competition. I believe nutrition is the absolute cornerstone or foundation of human health. Hippocrates said it best: "Food is thy medicine, and medicine is thy food." We simply must improve our nutrition and intake of foods which help our bodies, not harm them.

I think it best to consume small, frequent meals and avoid "stuffing yourself." This is especially true for the asthma patient. When your stomach expands from eating too much, it encroaches upon the diaphragm, which is the muscle of breathing, located between the chest and abdominal cavity.

We also need to cover Gastro Esophageal Reflux Disease, or GERD. Let's get back to muscular tubes, again. The esophagus empties into the stomach, where acid is produced to digest food. In GERD, there is an incompetent sphincter, or muscular ring designed to keep stomach acid from entering or refluxing back up into the esophagus. This is called the Lower Esophageal Sphincter. When this occurs, the esophagus becomes irritated, inflamed, and the acid can even irritate the upper airway, producing asthma as a result of the acid trigger. There may also be a nervous system component, (vagus nerve). Symptoms of GERD include: "heartburn, tasting food again you have just consumed, halitosis, chronic sore throat, and laryngitis.

See how nutrition and the gastrointestinal system may be related to asthma?

There are many contributing factors and things to consider in regards to asthma. Now, let us obtain a pulmonary (lung) medicine consult from one of the most respected physicians in the field.

Below, is an interview I conducted with Dr. Jamshed Kanga, M.D., FCCP, FACP. Dr. Kanga is Professor and Chief, Division of Pediatric Pulmonology, and the Director of the Cystic Fibrosis Center at the University of Kentucky, in Lexington, Kentucky. This serves to provide vital information concerning asthma and how it affects children and especially those who play soccer. It also will supply parents, coaches, and players guidelines to follow to help members with asthma perform at their best levels.

Q. Many soccer coaches, and coaches of other sports have asked about the use of inhalers, in regards to athletes with asthma. Can you please elaborate?

A. The most commonly used inhaler and the only ones that the patient should be using on the field are what is called short acting beta agonists or SABA - albuterol being the most common drug used in this class. SABA are also referred to as "rescue medication" as they are very effective in helping with asthma symptoms. For exercise induced asthma children can use is 15 to 20 minutes prior to exercise and that very often is the only treatment that many children with exercise induced asthma need.

There are several other inhaled medications that are called "Controllers" for asthma.

The best controller medications are inhaled corticosteroids or ICS. These are the best controllers and are available in many different forms (Metered dose inhalers versus dry powder inhalers) and different drugs. Brand names for common ICS are Qvar, Flovent, Asmanex, Alvesco, AeroBID etc. To be effective, they have to be used every day.

Another controller medication is long acting beta agonist or LABA. These drugs help control symptoms over longer duration than SABA, but their use has some concerns and they should never be used without patient also using an ICS. The only LABA now available is Foradil.

Then we have the combination products of ICS and LABA. Commonly available combination products include Advair, Symbicort and Dulera. Like the ICS, these should also be use daily to help control asthma.

Another class of inhaled controller medication are Mast Cell Stabilizers - given by inhalation on a regular basis. Drugs in this class include Intal and Tilade. The only oral controller asthma medication is Singulair which is a non-steroidal controller medication taken once daily and is very effective in controlling asthma and allergies. I has also been shown to be effective in controlling exercise induced asthma.

The reason children are using their rescue inhalers less often these days may be due to the fact that their asthma is now being adequately controlled with proper use of controller medications as listed above.

Q. Soccer is considered to be very good, sometimes strenuous exercise. For that reason, I at least wanted people to be familiar with the term "exercised induced asthma," and ask you about it.

A. Exercise induced asthma - EIA is very common - estimated to be as high as 10 percent of children. Exercise is also a universal trigger for asthma in asthmatic children. We do not restrict children from exercising as we have good therapy to control asthma and that all children should get regular

It is important to understand that cough, wheezing, shortness or air or a tightness in the chest (chest pain) can all be signs of asthma. Frequently children who cough are not diagnosed to have asthma although this is probably the most common manifestation of asthma in all age groups.

Q. If you are a parent or coach of a child with asthma, please give advice to minimize an acute attack while playing the game.

A. If your child has asthma it is important to work with your doctor to make sure he / she is on appropriate treatment - especially the use of controller asthma medication that must be used on a daily basis. The protocol that I prescribe for my patients to minimize the risk of an asthma exacerbation during exercise are as follows:

- 1) Albuterol - 2 to 4 puffs - 15 minutes before exercise
- 2) Warm up - 3 minutes on then 2 minutes of rest and stretches - 3 cycles of increasing intensity prior to exercise
- 3) If short of air or coughing during exercise - STOP - rest, get a drink of warm water. After 5 minutes if OK, may go back to exercise
- 4) If still having symptoms after 5 to 10 minutes of rest - child can take 2 to 4 more puffs of albuterol - no more exercising for the day

Q. I read where 22 million people have asthma. This seems very high and on the increase. Why do you think the number of cases is climbing?

A. 22 million people of which 6 million are children. The increase incidence has been attributed to many reasons including - better and earlier diagnosis, air pollution and actually the hygiene hypothesis that states that our children are now being raised in a "sterile" environment and are not being exposed to childhood illnesses and thus their immune systems are moving towards a more allergic state.

Q. Can you relate asthma to nutrition?

A. Yes – There is a lot of evidence to show that as our children are getting heavier, we are seeing a rise in asthma. Weight control is essential for all children, but in children with asthma, their asthma gets worse as they gain more weight. Also being overweight makes it harder for these children to exercise and they get short of air and have asthma symptoms more quickly.

Q. It seems nutritional balance and eating good foods such as fruits, vegetables, lean protein can help. We consume way too many fast foods. As you say, obesity and being overweight can affect asthma. Please describe this relationship.

A. As above; there is a definite correlation, and we are not sure of the exact cause. It has also been suggested that certain inflammatory substances that cause the airway inflammation in asthma may also be causing the decreased metabolism and increase weight gain leading to obesity.

Q. I am a traditional surgeon, but I do believe in some cases, alternative medicines can be a choice worth trying. For example, all of my family takes probiotics, fish oil, and multivitamins. Would you recommend any of these to a parent to try for their child with asthma in addition to the standard medical treatments? For example, if they have been worked up for the underlying cause, treated but still have problems. Is this worth a try?

A. Some alternative medications such as fish oils and vitamins are good, but there are other treatments out there that can be harmful. Before these are used it is important to look into them closely. One

alternative medication has substances that resemble steroids in them and will make asthma control better but have significant side-effects.

Q. Please describe the relationship between Gastro Esophageal Reflux Disease ,(GERD) and asthma. Do many children suffer from both, simultaneously?

A. GERD and asthma are very common in all age groups. Children with poorly controlled asthma should be evaluated for GERD. The presence of acid in the esophagus can induce a vagal response that causes bronchospasm and asthma symptoms. A good principal is to avoid food 2 hours before exercise and bedtime.

Q. It is my understanding long term use of drugs like Nexium, Prilosec, and others in the Proton Pump Inhibitor category, PPI, if you will, may possibly result in decreased absorption of nutrients, vitamins, and minerals due to altered pH of stomach acid. Do you think this to be a contributing factor?

A. Proton Pump Inhibitors, PPI have been associated with decrease absorption of Vitamin D and low vitamin D levels have been associated with poor control of asthma.

In general, it is recommended Vitamin D levels be checked in all children who have poorly controlled asthma, despite good treatment and adherence.

Q. Please describe major points of prevention of both chronic and acute asthma.

- A. 1. Avoid asthma triggers - dust, smoke, strong odors like perfumes and paints, and allergens - cats, dogs, etc
2. Avoid food and drink before bedtime and exercise
3. Make sure you use your controller asthma medication as prescribed
4. Follow the exercise protocol outlined above
5. Periodic checkup with lung function testing every 3 to 6 months is recommended for all patients with asthma older than 5 years of age

Q. Should it be a goal to get kids off their inhalers completely?

A. Yes - the less SABA you are using (other than when you use it as a prevention prior to exercise) - the better controlled your asthma is.

No - as far as the asthma controller medications go - these must be used regularly as prescribed to effectively control the inflammation of the bronchial tubes that is the cause of the asthma symptoms and if not treated adequately may result in permanently narrowed bronchial tubes and abnormal lung function as we see in people with Chronic Obstructive Pulmonary Disease, or COPD.

Q. Any other comments you may have in regards to treatment, prevention, or any other salient points you want coaches, parents, and kids to know would be greatly appreciated.

A. Children with well controlled asthma can be as normal as every other kid in sports, etc. Most children with asthma will get better as they get older, and many children go off their controller medications.

Dr. Snodgrass: Dr. Kanga, thank you very much for this great interview to help parents, coaches, and players cope, and overcome the symptoms of asthma as they compete on the soccer field. As you know, our goal is to help them play at their very best levels, but we also want to help them live healthier lives well beyond their soccer playing years. The ultimate objective is to create generations of healthier people.

Dr. Kanga: Thank you for including me on this project.

Dr. Steve Snodgrass, M.D., F.A.C.S.

Dr. Steve Snodgrass, M.D., F.A.C.S., is a board-certified surgeon, a member of the American Medical Association, a Fellow of the American College of Surgeons, former Chief of Surgery (HCA Greenview Hospital), father of two athletic sons, and CEO of Peak Performance Foods. Dr. Snodgrass advises athletes competing in all levels of competition concerning helping them meet physical/nutritional demands. He also does the same for many patient groups: those with diabetes, renal failure/dialysis, chronic wounds, and cancer.

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Dr. Jamshed F. Kanga is Professor and Chief, Division of Pediatric Pulmonology, and the Director of the Cystic Fibrosis Center at the University of Kentucky in Lexington, Kentucky. Dr. Kanga received his medical degree from Dow Medical College, University of Karachi, and completed a residency program in Pediatrics at Beth Israel Medical Center in New York, NY. He was appointed Chief Resident in pediatrics at Beth Israel Medical Center. Dr. Kanga received fellowship training in Pediatric Pulmonology at Tulane University School of Medicine in New Orleans and is board certified in Pediatrics and Pediatric Pulmonology. He is a member of the American Academy of Pediatrics, the American Thoracic Society and a Fellow of the American College of Chest Physicians. He is on the review board for JAMA and Chest. Dr. Kanga has received numerous teaching awards during his 27 years at the University of Kentucky and enjoys caring for children and young adults with respiratory illnesses.