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www.twitter.com/HealthHitsPod

HealthHitsPod@gmail.com

Hello and welcome to the Health Hits podcast.

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Today's episode is all about asthma.

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Asthma is a respiratory condition, a condition that affects the airways.

It's a Greek word and the first time we see it written down is around 800 BC by Homer in the Iliad when he talks about the Trojan War. Specifically when Hector (played by Eric Bana in the film Troy) is hit in the chest with a boulder thrown by Ajax the Giant, and he suffers from difficulty in breathing. As anyone might.

The WHO estimates between 200 and 250 million people suffer with asthma worldwide and in European countries it accounts for 1 in 200 of all hospital admissions.

Why do we breathe in the first place?

Well it's to get oxygen from the air into our lungs, then to our bloodstream to power our cells, and then to get carbon dioxide, the waste product, out.

What physically happens?

Well when we breathe in through our nose or mouth, air flows down our windpipe into both sides of the lungs where the airways get smaller and smaller the further into the lungs they go.

Imagine looking down the centre of a toilet roll. Air would flow easily along that tube. But in asthma two main things happen. Swelling occurs on the inside of the tube, thus narrowing it.

Everyone can experience a similar thing when a cold causes inflammation that restricts breathing through the nose. It's the same in asthma, only lower down the pipes.

The second thing that happens is muscle contraction or bronchospasm. Imagine that the toilet paper wrapped around that cardboard tube is actually muscle. If that were to contract or squeeze, the tube would again narrow.

A combination of contraction of the muscle wall and swelling building up within the airway can cause the shortness of breath, the wheezing and the coughing that we commonly associate with asthma.

Why are some people affected by this?

Well if you exposed anybody, even someone without asthma to enough irritant, such as a lot of dust or chemicals they would start coughing and wheezing.

An almost universal irritant would be Tear Gas which would produce the same respiratory symptoms in anybody.

However, in asthma, people seem to have more sensitive airways so they experience the reaction described previously at much lower levels.

There is a strong family link, and to date over 100 genes have been found that increase your chance of having asthma.

Typically a viral infection, pollen, dust mites, chemicals, exercise, cold air, could all trigger the airways reaction.

However, a boulder to the chest, thrown by a legendary giant isn't commonly described in modern literature.

Diagnosis of asthma is usually based upon the presentation and if wheeze is heard with an obvious reproducible trigger in someone with a family history of asthma or a personal history of another sensitivity condition such as eczema (which we will cover in another podcast) then we often move straight into treatment.

However, if there is any uncertainty then a test called spirometry is performed. It's as simple as blowing into a machine, a bit like a breathalyser and will measure the total lung volume and the volume of that air the patient can get out of the lungs in 1 second. You can imagine that if the airways are narrowed from the swelling and the muscle wall contraction that less air would be able to move over the same timeframe.

Once the diagnosis is made how do we treat it?

Well in mild cases avoiding the irritants can be enough to remove the symptoms.

I have seen patients who have had asthma triggered by house dust mite and when they got new carpets or changed their carpets to wooden floors their symptoms disappeared.

However in more severe cases treatment is required. The two main medications are bronchodilators and steroid inhalers.

The bronchodilators such as salbutamol work by relaxing the muscles in the wall of the airways, and so stopping the contraction that was narrowing them. Essentially this drug opens the airways up.

It typically lasts 4 hours in the system.

The steroid inhalers come in many many forms but essentially what they do is reduce the inflammatory response to the irritants and so reduce the swelling inside the airways.

A common reason that asthmatics get into trouble is if they are regularly using lots and lots of salbutamol to keep the airways relaxed, but all the while inflammation is continuing to build and cause narrowing from inside.

The bronchodilators comes in longer acting forms that keep the airways muscle relaxed for up to 12 hours.

Inhalers were first invented in 1968 by a man called Robert Wexler and it revolutionised asthma treatment. Prior to that a lot of the medications were taken by mouth and caused lots of side effects.

The beauty of the inhaler is that it will deliver the drug directly into the lungs and so the dose, and therefore the side effects, can be far lower.

When inhaling the drug there is a technique that needs to be mastered because breathing in too softly will cause the drug to sit on the tongue but breathing in too hard can cause the drug to hit the back of the throat and never reach the lungs.

A spacer device can often help with technique as it won't allow the air to flow with too little breath, but will whistle if you are breathing in too hard.

Links to excellent resources for this can be found on the twitter page and my main site www.healthhits.info

If inhalers do not control the symptoms alone then there are various tablets which can improve symptoms. Often a short course of oral steroids can be taken to reduce the airways swelling and to reduce the sensitivity of the airways.

These cannot be taken long term without side effects such as weight gain, fluid retention, bone thinning or osteoporosis.

However, a drug called Monteleukast first approved for use in the 1990s can often be used longer term in difficult to control asthma. It works by attaching to a part of the cells in the airways to reduce the inflammatory response. It is associated with side effects but can often reduce the need to strong steroid treatments.

In extreme circumstances injection or inhalation of adrenaline or epinephrine if you're in the US can be used to open up the airways and improve breathing.

Right that’s about all for this episode.

I would say that there are excellent written resources out there and will leave links to them on the twitter feed and the site HealthHits.info.

Thank you so much for listening and please join me again for another episode of Health Hits.