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Hello and welcome to the Health Hits podcast.

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I'm your host Tom Fisher, and this week we talk all about that miserable rite of passage that all children in the UK go through: Chickenpox.

We'll talk about how it affects us and why, the latest controversial evidence about managing it, as well as the available but almost unused chickenpox vaccine.

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So Chickenpox.

First described by 16<sup>th</sup> Century Sicilian physician Filippo Giovanni Ingrassia it is a highly contagious viral infection.

The virus is called the varicella zoster virus. Varicella because it causes chickenpox and zoster because it also causes shingles.

We'll cover shingles in detail in the next episode.

It is mostly referred to as varicella around the world, but in English we call it chickenpox. There are many theories out there as to how this name came about, but my favourite is that it was coined by Samuel Johnson.

Johnson of course famously spent 9 years of his life compiling his dictionary of the English language, considered by many to be one of the greatest single achievements of scholarship. Perhaps greater even than the Health Hits podcast.

The story goes that at the time varicella seemed to be a milder or weaker form of the much more deadly smallpox, and so it was chicken or cowardly in comparison, so chicken pox.

I always thought that chicken to describe someone who was a coward was first used in the 1985 film Back to the Future but after some research it turns out that the term but it was being used as early at 1600. So even earlier than the 1885 of Back to the Future 3.

It was a British doctor called William Heberden who was the first to demonstrate that chickenpox and smallpox were in fact separate diseases. His name has been immortalised in medical history thanks to his description of the bony swellings of the end joints of the fingers that occur in osteoarthritis, known as Heberden's nodes.

But, coming back to chickenpox – it can be airborne and spread from person to person in coughs or sneezes. The virus gets into the lungs and spreads easily from cell to cell. Then it hitches a ride on a type of white blood cell called a T cell. These immune cells unwittingly carry the virus to the skin where the virus copies itself and you end up with those red spots that then turn into blisters. It takes as long as 10-20 days from first contact to developing this distinctive rash.

The fluid in these blisters is obviously teeming with varicella virus and so contact with this can cause chickenpox too.

The immune system eventually gets a handle on the virus and suppresses it, the process from symptoms to recovery taking around 2 weeks. In the UK children have historically been excluded from school or nursery until

the blisters have dried up, but the evidence shows that transmission doesn't actually occur beyond 5 days from the start of the rash.

Adults can potentially become more unwell, and pregnant women who come into contact with chickenpox for the very first time should seek medical advice immediately.

But for most children, chickenpox is a mild, but irritating condition.

The spots and blisters can be very itchy, so antihistamines or soothing creams can help here. The spots shouldn't scar unless they are repeatedly picked.

The virus obviously provokes a strong immune response, including raising the body temperature, which results in fever.

This happens because of release of hormones called prostaglandins which reset the internal thermostat in the brain, called the hypothalamus, and the body warms itself up.

Paracetamol and ibuprofen block this effect and so can lower the temperature which usually makes children feel much more comfortable, and they are often happier to eat and drink.

Until recently both were recommended for the fever in chickenpox, but recent studies have cast doubt on the safety of ibuprofen in chickenpox.

A number of studies have found an association between use of ibuprofen and children with chickenpox developing severe skin infections.

We know that bacterial infections of the skin ARE a possible complication of chickenpox, simply because the raw broken skin of the rash can let bacteria from the surface in, and if that takes hold it could cause a serious infection.

Of course the question is: are children who end up being given ibuprofen simply hotter, more unhappy, and more ill because they are starting to develop a more significant infection, including a bacterial skin infection; or is the ibuprofen itself actually modulating the immune system and making the bacterial infection more likely.

I'm not convinced either way, so for now I will be following the advice of the National Institute of Clinical Excellence in their Clinical Knowledge Summaries which advise using only paracetamol and not ibuprofen in chickenpox.

Now the immune cells that recognise and eventually suppress the virus persist in the body and effectively make us immune to further episodes of chickenpox.

Chickenpox is so common its very hard to find an exact number of worldwide cases, but I've seen figures from the CDC that state that in the USA, a country of 320 million people, around 4 million people a year used to get chickenpox, 12,000 were hospitalised, and 130 a year died.

I say used to because since 1995 a vaccination against chickenpox has been available. It was created by Japanese scientist Michiaki Takahashi in the 1970s after he observed how unwell his own son became. He took the virus and grew it in human lung cells, and managed to change it, or attenuate it, to make it harmless.

It will cause no symptoms but will provoke an immune response so that we are effectively immune when we come in to contact with the real chickenpox virus.

Its fantastic, and with a vaccine uptake of over 90% in the USA, the number of cases of chickenpox and the number of hospital admissions and the number of deaths have all dropped by about 90% as well.

So why don't we have the vaccine in the UK?

Well there are a number of explanations given by NHS organisations, government groups like the Joint Committee on Vaccination and Immunisation, as well as uninformed media speculation.

The first argument against vaccination is that people are not ready for a new vaccine because of the shadow of the MMR scandal. This was supposed, and now thoroughly disproved link between MMR vaccination and autism.

A lie propagated by that self serving British doctor, Andrew Wakefield, who disgraced himself and my profession when he published papers that suggested this link.

Years of investigations by the GMC, the BBC and newspapers, including the Times, found that he had manipulated evidence for his own gain. He was rightly struck off the medical register and will never practice as a doctor again, but, I suppose predictably, has now found a voice in the fringe “anti-vax” movement which is propagating its own falsehoods in the USA.

We have to remember that measles, mumps and rubella are serious medical conditions. The number of UK cases of measles when this fabricated paper was published in 1998 was around 100 a year. The hysteria it created led to reduced vaccination rates and so cases rose over the following years, climbing by 2000%.

There were at least 2 unvaccinated children who died in that time, and the finger of blame undoubtedly is pointed at this disgraced former doctor.

Thankfully vaccination rates have now increased and measles in particular is on the decline.

But to suggest this legacy is a reason not to offer a new vaccine is irrelevant, as we can quite clearly see a huge appetite for the chickenpox vaccine since the mid 90s in the USA and the meningitis B vaccine, a new vaccine, was introduced to the NHS schedule in 2015.

So what about the impact?

Well the second argument is that it is a trivial childhood illness and so not necessary to vaccinate against.

I disagree with this on 2 counts. Firstly, as we discussed before, people do end up in hospital and do die from chickenpox. In pre-vaccination America, 130 a year died from a population of 320 million. Figures published in the British Medical Journal suggest that in the UK it is around 20, from a population of 65 million.

Secondly, one parent is forced to stay at home with their child for that exclusion time of 5 days during the illness and so the number of missed working days could be as high as 4,000,000. This is ridiculous, and likely costs the economy hundreds of millions or even billions of pounds.

The third argument against vaccination is that it may increase the number of serious cases of chickenpox or number of shingles later in life.

Unvaccinated children, growing up surrounded by vaccinated children, may not get chickenpox until later in life. And we do know that adults can get more seriously ill. So on the face of it, that sounds like a reasonable concern. However, we haven't seen that borne out in statistics in the USA since the 1995, and the evidence continues to show dropping hospital admissions and death rates.

We will cover shingles in more detail in the next episode, but essentially shingles is an adult flare up of the varicella zoster virus that has been suppressed since it caused chickenpox. It is thought that contact with children with chickenpox helps to keep the immune system boosted, and keep shingles from flaring up.

Whilst it is true that the number of cases of shingles has increased since the introduction of the chickenpox vaccine in the USA, the CDC reports that it was actually increasing before this, and the rate of increase hasn't gone up.

But even if there is a link, it seems a bit perverse to let our children get sick in order to be walking biological vaccine factories for the adults. Especially when you know that there are perfectly good vaccines for chickenpox and shingles that use cell cultures to grow them, not human children.

And so I can conclude that the limiting factor in adding the chickenpox vaccine to the NHS immunisation schedule is almost certainly money.

The vaccine costs around £100 per child and although that money would be recouped many times over by the reduced number of missed working days, it would be a large initial outlay for an organisation that is financially beleaguered.

This is not a political podcast, but if we as a people, through our elected representatives choose not to fund particular public health initiatives then there will of course be consequences. Avoidable consequences in my opinion.

The chickenpox vaccine is fully licensed and has been administered for over 20 years, and if you want your child to have it, you can pay privately in most travel clinics and I know some GP surgeries offer it. I was surprised when I discussed it with a GP who does offer it privately that there is currently only minimal uptake, and I assume that is related to both the lack of awareness and the various unhelpful counter-narratives in media.

I should also say that I have no personal reason to promote the chickenpox vaccine, I neither administer it myself or benefit in any way from the private vaccinations that are available. My opinions come from my observations over the years, and my more recent careful research around this subject.

I hope you have found this episode as interesting to listen to as I found it to research, and I have left links to some of the journals I have made reference to on the resources library on [HealthHits.info](http://HealthHits.info).

Next time we'll talk more about shingles, the long term complication of chickenpox, but for now I say thank you for listening and join me next time, on Health Hits.