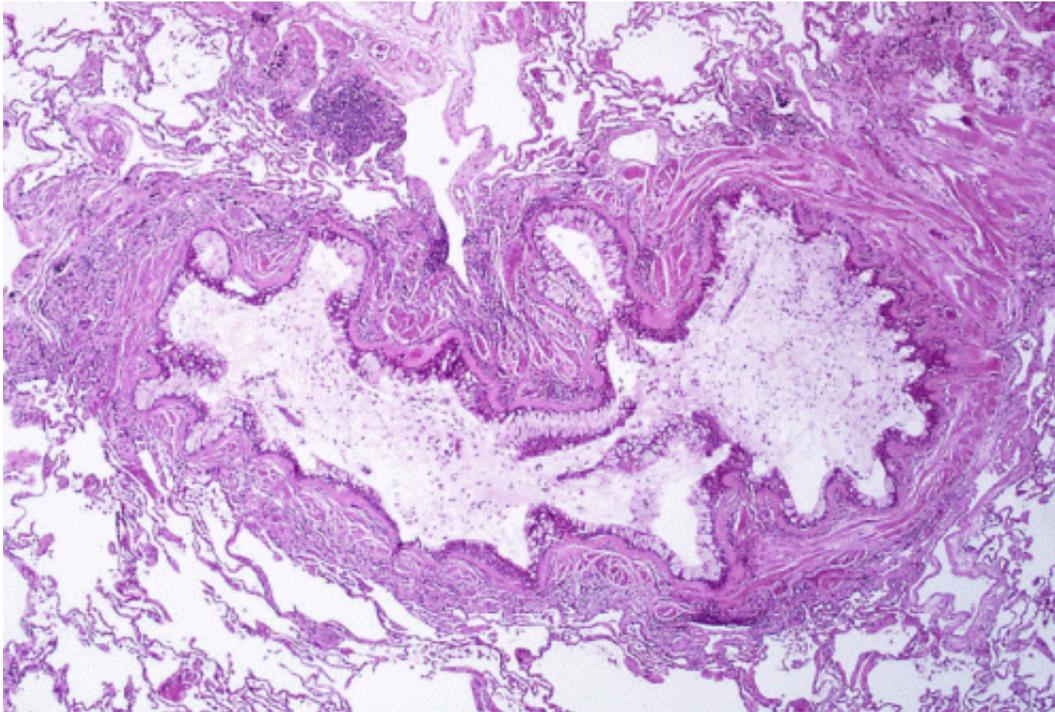


Higher circulating sex hormone regulator (SHBG) levels linked to lower asthma risk

April 1 2019



Obstruction of the lumen of a bronchiole by mucoid exudate, goblet cell metaplasia, and epithelial basement membrane thickening in a person with asthma. Credit: Yale Rosen/Wikipedia/CC BY-SA 2.0

Higher circulating levels of the sex hormone regulator, SHBG, seem to be causally linked to a lower risk of asthma-at least in women-suggests the first study of its kind, published online in the journal *Thorax*.

This is the first evidence showing that sex hormone levels might have a role in helping to explain the observed gender difference in [asthma prevalence](#), say the researchers.

But, as yet, it is unclear which sex hormone might be involved, they emphasise in a linked podcast. And further research is needed to unravel exactly how SHBG might exert its influence.

The research to date suggests that during childhood boys are more likely to have asthma than girls, but during the [teenage years](#) and adulthood, the reverse is true.

It has been suggested that sex hormones might be implicated in this switch, because these fluctuate considerably during adolescence, while asthma symptoms worsen during the menstrual cycle.

The level of circulating SHBG is partly inherited, so the research team combined long term [observational data](#) with genetic data to look at the effects of sex hormones on asthma risk.

For the observational data, they used measurements of SHBG and total testosterone, taken every two years from 513 boys from the age of 9 to 17.

The boys were part of the Children of the 90s Study (ALSPAC), which has been tracking the health of thousands of people born in the Avon region of England since 1991-2.

Information on asthma symptoms was supplied by the boys' mothers when they were aged 10 and 13, and by the participants themselves at the ages of 16 and 22.

The researchers then pooled genetic data on asthma from participants in

the UK Biobank and the Trans National Asthma Genetics Consortium—more than 460,000 people combined—applying a statistical technique called Mendelian randomisation.

This allows researchers to rule out the influence of various factors that might otherwise make it harder to determine a possible cause.

The observational data indicated that higher levels of circulating testosterone in teen boys were weakly associated with lower asthma risk, but no strong links were evident for SHBG levels.

The [genetic data](#), however, indicated that higher levels of SHBG were associated with around a 14 per cent lower odds of asthma, although this effect was mostly seen in women.

"Although previous hypotheses have suggested an immunological/inflammatory effect of SHBG on asthma, [Mendelian randomisation] does not distinguish between which mechanistic pathways link the exposure to the outcome. Therefore, any indication of SHBG's causality does not imply a biological or immunological effect of sex hormones," caution the researchers.

In a linked podcast, lead author Dr. Ryan Arathimos, explains: "We found a [protective effect](#) of increased SHBG on asthma and observed that this was stronger in females. But we couldn't distinguish whether the effect was sex specific—so if the effects of SHBG on asthma only exist in females—and our study design didn't permit us to say if the protective effects of SHBG are in childhood, puberty, or [adult life](#)."

He adds: "We don't know exactly which [hormone](#) or combination of hormones, be it testosterone or oestrogen, is having the effect on [asthma](#), so further work is definitely required to disentangle the pathways involved."

More information: Genetic and observational evidence supports a causal role of sex hormones on the development of asthma , *Thorax* (2019). [DOI: 10.1136/thoraxjnl-2018-212207](https://doi.org/10.1136/thoraxjnl-2018-212207)

Provided by British Medical Journal

Citation: Higher circulating sex hormone regulator (SHBG) levels linked to lower asthma risk (2019, April 1) retrieved 19 April 2024 from <https://medicalxpress.com/news/2019-04-higher-circulating-sex-hormone-shbg.html>

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