How fingers could point to a link between low testosterone and COVID hospitalizations

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Could the length of a person's fingers provide a clue to how ill they might get after contracting COVID-19?

It is widely recognized that a longer ring finger is a marker of higher

levels of testosterone prenatally, whereas a longer index finger is a marker of higher levels of estrogen. Generally, men have longer ring fingers, whereas women have longer index fingers.

New research involving Swansea University is examining the link between levels of sex hormones in the womb and in puberty and COVID hospitalizations.

Most people who contract the virus only experience mild symptoms. But when it comes to patients who need hospital care, the rates vary depending on age (with elderly people the most affected) and gender (with males experiencing a higher severity than females).

This has led scientists to examine the link between testosterone and COVID-19 severity more closely. One hypothesis implicates high testosterone in severe cases but another links low levels of testosterone in elderly men with a poor prognosis.

Now Professor John Manning, of the Applied Sports Technology, Exercise and Medicine (A-STEM) research team, has been working with colleagues from the Medical University of Lodz in Poland and Sweden's Karolinska University Hospital to look more closely at digit ratios (ratios of the 2nd, 3rd, 4th and 5th digits) as predictors of severity of COVID-19 symptoms.

The researchers observed that patients with "feminized" short little fingers relative to their other digits tend to experience severe COVID-19 symptoms leading to hospitalization, and more importantly patients with large right hand—left hand differences in ratios 2D:4D and 3D:5D—have substantially elevated probabilities of hospitalization.

These preliminary findings have just been published in *Scientific Reports*.

Professor Manning said that their "findings suggest that COVID-19 severity is related to low testosterone and possibly high estrogen in both men and women.

"'Feminized' differences in digit ratios in hospitalized patients supports the view that individuals who have experienced low testosterone and/or high estrogen are prone to severe expression of COVID-19. This may explain why the most at-risk group is elderly males.

"This is significant because if it is possible to identify more precisely who is likely to be prone severe COVID-19, this would help in targeting vaccination. Right-Left differences in digit ratios (particularly 2D:4D and 3D:5D) may help in this regard."

There are currently several trials of anti-androgen (testosterone) drugs as treatment for COVID-19. However, in contrast, there is also interest in testosterone as an anti-viral against COVID-19.

He added that their "research is helping to add to understanding of COVID-19 and may bring us closer to improving the repertoire of anti-viral drugs, helping to shorten hospital stays and reduce mortality rates."

Professor Manning said the team's work would now continue. "The sample is small but ongoing work has increased the sample. We hope to report further results shortly."

His previous work in the field highlighted how the length of children's fingers relate to mothers' income level and point to susceptibility to diseases that begin in the womb.

Researchers led by Professor Manning revealed that low-income mothers may feminize their children in the womb by adjusting their hormones, whereas high-income mothers masculinize their offspring.

More information: A. Kasielska-Trojan et al, Digit ratios and their asymmetries as risk factors of developmental instability and hospitalization for COVID-19, *Scientific Reports* (2022). DOI: 10.1038/s41598-022-08646-7