Covid-19: What do we know about the delta omicron recombinant variant?

A combination of the delta (AY.4) and BA.1 omicron variants has been named by the World Health Organization as the BA.1 x AY.4 recombinant. First detected in France in January 2022, it has since picked up the nickname “deltacron”—Elisabeth Mahase finds out more.

Elisabeth Mahase

How does a recombinant emerge?

Recombinants can emerge when multiple variants infect the same person at the same time, allowing the variants to interact during replication, mix up their genetic material, and form new combinations. These events become more likely when cases are higher—an important consideration, as covid-19 cases worldwide have once again started to rise after several weeks of decline.2

Maria Van Kerkhove, the World Health Organization’s covid-19 technical lead, said in a post on social media, “[This is] what happens when we allow the virus to circulate at such an intense level. The virus continues to evolve and more variants are expected. Recombinants are also expected . . . as we have been explaining for a very long time.”

She emphasised that vaccines alone could not be used to control the SARS-CoV-2 pandemic but that other measures were also needed, while testing and sequencing around the world were vital.

What do we know about “deltacron”?3

So far, very little. The literature on deltacron is sparse, although a perspective published by the Chinese Center for Disease Control and Prevention has provided some insight.4 The researchers have reported that the recombinant is very similar to the delta (AY.4) variant except when it comes to the region encoding the spike gene, which is similar to BA.1. Of the 36 amino acid mutations found in the spike protein, 27 were found in BA.1 and five in AY.4, while four were found in both.

The authors have also highlighted that while this is not the first recombination event identified in SARS-CoV-2, and while some have even seen a small amount of community transmission, no previous events have involved such large genomic fragments. As such, the authors said that the emergence of the BA.1 x AY.4 recombinant could be a cause for concern.

They warned, “Although the emergence and subsequent spread of variants of concern has had a huge impact on global health and economy, it may not have been the worst case until now, as recombination (a major mechanism bringing genetic diversity to coronaviruses) has not really emerged on a large scale and shown its power before the emergence of ‘deltacron.’

“The emergence of ‘deltacron’ is therefore a ‘grey rhino’ [an obvious threat that has been ignored or played down] rather than ‘black swan’ [an unlikely but extremely serious] event . . . With the advent of ‘deltacron,’ further concerns are coming.”

On the other hand, a preprint released through medRxiv suggested that delta and omicron coinfections and recombination events were still rare.5 Researchers sequenced 29 719 positive samples taken from November 2021 to February 2022, when delta and omicron were co-circulating in the US. They found 20 coinfections and two independent cases of infection by a delta-omicron recombinant virus. They concluded that these recombinants were rare and that there was currently no evidence that those identified in this study were more transmissible than the omicron lineages already circulating (BA.1, BA.2).

Shishi Luo, lead author and a senior bioinformatics scientist at the genomics company Helix, told The BMJ, “We haven’t seen any evidence for concern for either of the recombinants reported in our study. However, given that other recombinants are being identified at around the same time around the world, we should definitely be increasing our ability to monitor and track them.”

Speaking to The BMJ, Eric Topol, professor of molecular medicine at the Scripps Research Institute in California, echoed the message that while this recombinant may not pose a threat, it could be a warning of what is to come.

“There have been at least three different ‘deltacron’ variants identified now,” he said. “Our concern about them is tempered by lack of evidence that any of these have spread potential or signs of increased virulence. But their appearance emphasises the potential for these recombinant, fusion, hybrid occurrences.

“At the same time, more simultaneous coinfections of variants are being recognised, and there’s also the potential of these occurring in animal reservoirs, or like with bird flu-influenza, a recombinant between humans and animals harbouring SARS-CoV-2.”

References


