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Dietary supplement in fruits and vegetables said to fight respiratory illnesses

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A dietary supplement found in pumpkins, peas and other fruits and vegetables may help the body fight COVID-19 and other winter illnesses, a new study has discovered.

"Inhibition of Respiratory RNA Viruses by a Composition of Ionophoric Polyphenols with Metal Ions" was published in the peer-reviewed, open-access academic journal Pharmaceuticals. The study looked at the effect combining zinc supplements with flavonoids – polyphenolic compounds found in many fruits and vegetables – could have on combating respiratory viruses, including COVID-19.

The study was led by professors Ehud Gazit, Eran Bacharach and Daniel Segal of the Shmunis School of Biomedicine and Cancer Research at Tel Aviv University's Wise Faculty of Life Sciences, together with PhD students Topaz Kreiser and David Zaguri and other researchers.

Respiratory virus infections are responsible for a substantial number of deaths worldwide each year, with the most wellknown of them being SARSCoV-2, the virus behind the COVID-19 pandemic.

The most effective way of combating the spread of viruses like COVID-19 or influenza is through vaccination, as well as the use of antiviral medications. However, because these viruses change rapidly, frequent updates must be made to the available vaccines to ensure they remain effective.

Therefore, alternative treatments that can work alongside these vaccinations, and antiviral medications are still in high demand, with constant research being undertaken to find new treatments.

One such treatment option can be found in the form of medicinal plants and herbal formulations, which the research team set out to study. The scientists hoped to find a way to combine natural compounds that are already readily available in a way that has a positive effect on various viruses.

The active composition developed by the scientists started with a basis of zinc, an element that has already been proven to have a strong link to respiratory viruses. A deficiency of zinc can lead to severe respiratory infection. In addition to this, it has been proven that among other mechanisms, zinc inhibits the RNA-dependent RNA polymerase of coronavirus, viral polyprotein cleavage in Rhinovirus, Encephalomyocarditis virus and foot and mouth disease virus, and it reduces the viral titer and plaque count of the respiratory syncytial virus (RSV).

The next step of the research was to examine how flavonoids, a group of bioactive chemicals found in nature and commonly included in the human diet, would work in treating respiratory infections when combined with zinc. Flavonoids are considered to have multiple positive effects on human health, including antibacterial, anti-inflammatory, antioxidant and most importantly, antiviral properties.

The researchers then combined several nontoxic dietary supplements composed of zinc picolinate, copper sulfate and the flavonoids epigallocatechin-3-gallate (EGCG), quercetin, taxifolin (dihydroquercetin) and naringenin, which act as zinc ionophores and transport zinc cations through the cell membrane.

The combination of supplements effectively inhibited the replication of the virus in several cell types, notably in human lung cells, the researchers found. More than that, the supplement combination they created was more effective than if a person had taken each component individually, demonstrating that each supplement worked to strengthen the other ones included in the combination.

The supplement was tested on three different respiratory pathogens: the H1N1 influenza A virus (swine flu); human metapneumovirus; and HCoVOC43, a betacoronavirus that targets the human respiratory system in a similar way to SARSCoV-2.

Based on the positive effect these supplements seem to have had in the initial phases of experimentation, the study said: "Such an inexpensive combination of dietary supplements would be highly advantageous to have, alongside vaccines, as a safe prevention method affecting various RNA respiratory viruses."

“Advanced lab tests, including PCR, have shown that the new vaccines we developed did in fact reduce the viral load,” Segal said. “We found a 50%95% decrease in the genomic replication of various groups of RNA viruses, including COVID19, the flu virus, and others.”

“These results are very promising, possibly enabling the development of an orally administered biological shelf treatment,” he said. “Such a product will be safe, natural and effective against several types of viruses, including new mutations and variants – clearly an important step forward.”

However, the study’s authors stressed, all experiments so far have been conducted in vitro in a lab setting and have yet to be introduced in any form of a clinical trial. However, they hope a clinical trial will be launched in the near future, leading to safe and accessible treatment against multiple viruses.