

Lifestyle & Culture



Alkaloids: Great potential in the fight against Covid-19



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A pneumonia of unknown origin was reported for the first time in Wuhan on 31 December 2019 and was recognised as a pandemic by the World Health Organisation (WHO) in March 2020, which went on to claim over 6.5 million lives by the time of writing.

The causative agent was later identified as a novel coronavirus, given the name of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), a virus which is closely related to other viruses responsible for respiratory infections including the Middle East Respiratory Syndrome-Related Coronavirus (MERS-CoV).

The world saw unprecedented actions being taken by different countries to contain and minimise the transmission of the virus, including lockdowns and mandated mask-wearing. While vaccination campaigns against Covid-19 were rolled out, scientists from around the world sought new possible drugs that could treat, or at least manage, this infection. Scientists turned

to nature in an effort to find naturally occurring chemical compounds that could be used as leads for the production of drugs against Covid-19. Among these chemical compounds, there were colchicine, berberine and others which are all members of the same family – the alkaloids.

What are alkaloids?

Alkaloids are a family of naturally occurring compounds commonly found in plants consisting of over 12,000 different chemicals. These compounds are called secondary metabolites as their role is to defend the plant against predators through different mechanisms, such as making the plant toxic, potentially lethal, to predators or by making the plants' taste non-palatable to pests by making either the entire plant or parts of it taste like soap to those who try to eat it.

Some of these compounds possess anti-inflammatory, antiviral, anti-bacterial and anti-fungal properties. Due to these properties, different alkaloids captured the attention of scientists in the hope that some of them could be used in the production of drugs to treat the Covid-19 infection or ameliorate the symptoms of those infected.

This is not the first time that alkaloids were used as medications, with some of them having been used by our forefathers as treatments of several maladies

since at least 2,000 years ago.

An example of this is colchicine, an alkaloid found in many plants, including the autumn crocus (*Colchicum autumnale*) – a beautiful flowering plant which, as the name suggests, blooms in autumn. This chemical has been shown to possess anti-viral and anti-inflammatory properties.

It was mentioned as a remedy for rheumatic disease in an Egyptian medical text – Ebers Papyrus – dating back to 1500 BC. Nowadays, colchicine is found in pharmacies world-wide for the management of gout and pericarditis.

Colchicine is only one example of alkaloids which have found their way into our medicine chest. Other alkaloids which are used in a clinical setting – some of which our readers might be familiar to – include morphine (a well-known and a commonly used pain killer especially in surgery) and ephedrine (a medication commonly used to prevent low blood pressures during surgery). Both medications are listed in the WHO Model List of Essential Medicines, a list of medications that are deemed as important in the health setting as they are both effective and safe to use.

Colchicine

As mentioned previously, colchicine has anti-inflamma-

tory and anti-viral properties, for which reason it was touted as a potential drug for the management of Covid-19.

In one interesting case, the Covid-19 symptoms of two infected patients who were being treated with colchicine for gout resolved within days and both tested negative for the virus after four weeks of treatment.

Other studies have shown that the mortality rate of Covid-19 positive patients was lower in those taking colchicine. However, one must note that for increased confidence in such findings, these studies would require a larger sample size.

Berberine

Another alkaloid of note is berberine, which is found in the roots of the *Berberis vulgaris* and *Hydrastis Canadensis*, among others. It is known to possess antiviral properties against a wide range of viruses including the herpesviruses and influenza.

It has been used in traditional Chinese medicine and Ayurvedic medicine for centuries with recent studies showing that it is also able to decrease the blood sugar levels similar to some anti-diabetic drugs found on the market.

When taken with obatoclax, an experimental drug for the treatment of some cancers, berberine has the ability to stop the replication of Covid-19 in the nasal

cells, potentially inhibiting its transmission.

Conclusion

Although our life is coming back to normal, with restrictions lessening day after day, we have now to accept that we cannot eradicate Covid-19 completely, but rather we must learn to live with this virus, the same as we do for influenza and countless other pathogens.

Therefore, the search for safe and effective drugs for the management of Covid-19 infections is still of utmost importance as it was two years ago.

While some alkaloids, such as the ones we mentioned here, have shown great potential in the fight against Covid-19, further studies with large number of participants are needed before we can ensure that these compounds are safe and effective and can be put on the market.

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