

Can ivermectin be used to treat SARS-COVID-2?

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Abstract

Ivermectin, one of the “wonder drugs” manufactured totally in Japan is another wonder drug and easily available all over the world for its anti-parasitic property. Single dose removing the viral RNA within 48 hours is an epoch making in vitro finding in Australia. Intracellular transport of the virus in the target host cell is blocked and multiplication of the virus is stopped, thus aborting infection. Patna dose recommendation has been advocated for both prevention and treatment of SARS-COVID-19 with definite claim that it will have no side effects.

Keywords: Cargo transporter, Viricidal, wonder drug, Viral RNA, Filariasis, Round worm, River blindness.

Ivermectin, an anti-parasitic drug also called one of the “wonder drugs” (penicillin and aspirin being the other two wonder drugs) is available throughout the world and is FDA approved drug.¹ An Australian breakthrough study has conclusively shown to inhibit replication of SARS-COVID-2 and claims to halt CORONA virus replication in lab grown cells in 48 hours.

Ivermectin has shown activity against COVID - 2 in in vitro studies in Australia in first week of April. Single dose of the drug stops SARS-COVID virus from growing in cell culture and removes all viral RNA. This effective removal of all genetic material of the virus within 48 hours has been a landmark study, which also demonstrated significant reduction in genetic material even at 24 hours. Correct dose in human is yet to be established because of lack of pre-clinical and clinical studies. This drug earlier had also proved its efficacy against HIV, dengue and influenza viruses. This anti-parasitic drug ivermectin is also effective against head lice. This study opens up the possibility that a CORONA viricidal drug has been identified.

A joint study conducted by Monash University Biomedicine Discovery Institute (MBD) and Peter Doherty Institute of Infection & Immunity in Australia was led by Dr. Kylie Wagstaff from MBD institute. He opined that single daily oral dose is safe and results in significant reduction in serum level of viral NS-1 protein without change in viremia or clinical benefit. He further mentioned “Even a single dose could essentially remove all viral RNA by 48 hours” (stops growth in cell culture effectively eradicating all genetic material of the virus).¹

What is ivermectin and how does it work?

In the light of proven success in in-vitro studies against other viruses, the mechanism of ivermectin on SARS-COVID has to intervene the following step by step proceedings of virus – host cell attachment and subsequent consequences take place as under:⁴⁻

1. The virus has to infect the target host cell.
2. Virus gets transported into the nucleus of the host cell and multiplies into various copies.
3. The virus with the help of “cargo transporter” protein, gets transported into the nucleus of the host cell.
4. Ivermectin blocks this “cargo transporter”, thus preventing transport into the nucleus of host cell.
5. Increase in multiplication of virus is thus stopped and infection gets prevented.

It has originally been identified in studies on HIV-1 that ivermectin is an inhibitor of interaction between Integrase-Protein (IN) and Importin (IMP) α/β 1 heterodimer. It is responsible for IN-nuclear import. Ivermectin has since been confirmed to inhibit IN-nuclear import and HIV-1 replication. It also inhibits nuclear import of viral protein in dengue virus and simian virus.

Broad spectrum activity is believed to be due to reliance by many different RNA viruses on IMP α/β 1 during infection. It limits infection by various RNA viruses responsible for diseases like dengue, west Nile, Venezuelan equine encephalitis and influenza. It is similarly effective against DNA virus, Pseudo Rabies Virus (PRV). In spite of favourable both in in vitro and in

2. River Blindness (Onchocerciasis):- repeat every 3 to 12 months
 15 to 85 Kg – the dose is as for strongyloidiasis
 > 85 Kg – 150 mcg / Kg –

Patna dose recommendation

Due to the urgency of COVID pandemic, one can not wait for a human trial hence, it was decided to propose a dose schedule for prevention and treatment of COVID-19 and it was named Patna Recommendation.

Prevention

1 tablet of 3/6/9/12/15 mg depending on body weight in subjects exposed / likely to be exposed to CoV-2-health workers, frontline warriors including police/security personnel etc.

Treatment –

1. Repeat one tablet whenever the disease is suspected / confirmed whichever is earlier.
2. Repeat daily upto 5 days after confirmation of disease, if available prefer injectable than tablet.
3. If still not improving, repeat for 5 more days from 10th day.

Use of ivermectin shampoo/lotion

It is recommended to religiously use shampoo / lotion on regular basis before donning PPE and after doffing PPE with special care to the neck region apart from scalp to deal with the COVID virus population hidden in the hair.

Investigations

Liver and kidney function tests must be monitored.

Summary

The nuclear transport inhibitory activity of ivermectin is effective against CoV-2. Patna dose schedule is recommended for both prevention and management of the disease. This wonder drug which eliminated dreaded diseases like onchocerciasis and river blindness is simultaneously effective for roundworm, lice and lymphatic filariasis as well. With favourable lab results, the ivermectin is recommended to be used.

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Conflict of Interest

None.

References

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