

Two Promising Herbs that May Help in Delaying Corona Virus Progression

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ABSTRACT

Viral infection is a propagation of a hurtful virus inside the body because viruses cannot reduplicate without the helping of a host. Viruses infect the host by inserting their genetic material into the cells to make more virus particles, after that virus makes many copies of itself and start to infect the cells then viral illness occur, that may lead to cell damage, tissue devastation and the related immune response. Nowadays, the viruses which spreads are many, including hepatitis C virus, HIV and the current Corona virus family especially Covid-19. Corona virus family is a group of RNA viruses (SARS, MERS, and COVID-19), they can cause respiratory tract infections that can extent from moderate to deadly. Discovering new antiviral drugs is a pivotal matter, also the extensive research work to find natural products which are considered as a premium source to anti-viral drugs is extremely important. That's Why in this review we will focus on two types of herbs that may have an effective general role in anti-virus and may also play a crucial rule in fighting against the Corona virus.

KEYWORDS: Review; Corona Viruses; *Nigella sativa*; *St. john'swort*; Anti-viral; Natural anti-viral

INTRODUCTION

Viruses represent one of the most dangerous causes of different diseases. Viral infections can cause disease in healthy humans and usually infections are defeated by the immune system which can provide lifetime immunity to the host for that infective virus. In the same context, also vaccines can produce lifelong immunity to prevent some infections [1], but there are some viruses that we don't have vaccines against it till the moment, For example; Hepatitis C, HIV and finally the new Corona virus family especially (Covid-19).

We will expand further discussion about some of the serious viruses that we don't have vaccine against it yet; Hepatitis C, this virus can cause both acute and chronic hepatitis [2]. As for HIV, 770 000 people died from HIV-related causes in 2018 and 1.7 million people were newly infected by this virus, but also Immunodeficiency results in increased capability to a vast extension of infections Such as ; cancers and some other diseases that healthy people can repel with a better possibility [3].

Coronaviruses, a large family of viruses Including Middle East Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS) and recently (Covid-19). In general corona virus family are recognized to cause disease ranging from the usual normal cold to more critical health problems, In particular COVID-19 virus may cause serious symptoms which appears especially in the lung and lead to

difficulty in breathing, taking into account that older people, and those with chronic diseases are more likely to develop more serious medical conditions [4,5].

Natural products and herbal medicines are rich source for developing antiviral treatments: In this point, we will discuss the antiviral activities which come from two types of medicinal herbs (*Nigella sativa* and *St. john's wort*), Generally both of the two herbs shows antiviral effect against Hepatitis C, HIV and Corona viruses family. Previous studies have proved the impact of *Nigella sativa* extract as potent immunomodulator and the effect of the main active component in *St. john's wort* (Hypericin) which was reported to inhibit viral adsorption and permeation into cells [6,7].

Discussion:

The novel coronavirus (2019-nCoV) which has become a pandemic threat to the whole world, it is caused by beta corona virus. Many reports describing this outbreak, virus-host interactions, epidemiology, pathology and clinical manifestations [8-11]. In this review article we will focus on management and risk minimization by using natural remedies that proved to have good anti-viral proprieties especially against RNA-viruses.

Nigella sativa is known as black caraway or black cumin, a dicotyledon flowering plant of Ranunculaceae family [12].

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Food and Drug Administration In the United States of America classifies *Nigella sativa* as Generally Recognized as Safe (GRAS) and can be used as a spice or natural flavoring agent [13]. Seeds of *N. sativa* are traditionally used as a spice also in Middle Eastern cuisines, Palestine, India, Bengali and Polish cuisine that prove safety of these valuable seeds. In addition the black seed have been reported to have various number of significant medicinal effects against many health disorders [14]. e.g. Anticancer, antioxidant, antimicrobial, anthelmintic and antiviral [15-17, 6]. Moreover, it has been reported that Ns has showed antiviral activity against ILT Virus [18]. Ns have various pharmacological activities as it has many active constituents e.g. volatile oils, alkaloids and proteins [19]. it was also found that Ns can act as immunomodulator as it can increase T4 (helper T cell), T8 (suppressor T cells) and NK (natural killer cells) [20]. In addition *Nigella sativa* extract proved to have inhibitory effect on HIV protease [21].

Upon treatment of hepatitis C patients with NS, it was observed that the liver enzymes AST (Aspartate aminotransaminase) and ALT (Alanine aminotransferase) became in the normal range, in addition decrease in the viral load was also observed [22]. Moreover, black seed powder mixed with honey to form 10 ml paste was administered to pregnant women with positive HIV at the third trimester three times daily for one year, the obtained results revealed no transmission of HIV infection to any of the new born babies [23].

Corona virus family can cause many health problems as respiratory diseases with high mortality rate, bronchitis, hepatitis in both humans and animals, In 2003, SARS-CoV appeared, in 2012 MERS-CoV also appeared and killed many peoples, recently covid-19 that caused death of around 320000 around the world till now, so that corona virus family is a dangerous killer and continuous research should be conducted to protect human from them. HeLa-CEACAM1a cells were treated with Ns extract prior to viral infection with cov and the obtained results revealed replication decrease of cov [24]. These observations support the promiscuity of Ns extract to fight against RNA viruses eg. HCV, HIV and Cov.

Ns. Contains alkaloids with the isoquinoline backbone as nigellicimine and nigellicimine-N-oxide [25], isoquinoline is a bioisostere of quinoline which is the backbone of hydroxychloroquine, however the previous research reports focus on Ns whole extract and further studies need to be conducted to know the specific constituent which is responsible for giving Ns extract their antiviral properties.

The second point of our interest in this review article is the natural phytochemical which is hypericin, it is anthraquinone derivative and is considered one of the active constituents of *Hypericum* (Saint John's wort), it has diverse pharmacological activities e.g. antibacterial, antiviral and antidepressant. It can inhibit dopamine β -hydroxylase enzyme, then dopamine levels will be increased resulting in antidepressant effect [26-28].

Hypericin revealed good activity against HCV, as it can down-regulate and deacetylate heme oxygenase 1 enzyme so that the replication of HCV is decreased in hepatoma cells [29].

Additionally the ability of hypericin to inhibit HIV-1 replication was evaluated and it showed to inhibit HIV-1 in a dose dependent manner, However, its light-dependent antiviral activity is still representing a challenge in applicability of hypericin against HIV [30].

Extract of *H. Perforatum* with, its main active component Hypericin, was tested under light protected conditions and proved to have potent properties as anti IBV (Which is one of Coronaviruses family), this observed effect due to the reduced levels of mRNA expression of IL-6, TNF- α and up-regulated levels of mRNA expression of type I interferon. This prove the usefulness of *H. perforatum* extract for getting new promising antiviral agents [31]. However, we still need further studies to investigate the mechanism of action.

Conclusion

In this review article we tried to find herbal medicinal products that may help in minimizing the risk of coronavirus (Covid-19) as there is growing global interest with herbal medications. Activity of *Nigella sativa* and *St. john's wort* against many types of viruses especially corona virus family give us the hope and also support the postulation that these two herbs may help in delaying the progression of covid-19 infection. These valuable facts deserve consideration and further studies to let these herbal medications turned into practice.

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