Polyphenols in Matily Herbal & Spices Boosts Antibodies in an Elderly Following COVID 19 Infections – A Case Study

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Abstract:
An elderly patient had COVID-19 infection in August 2020 and started the home remedies treatment for the first 18 hours, followed by Azithromycin 250 mg for 6 days. The patient revered well, and the infection was confirmed by antibodies in the patient's serum. Later on, the patient was on Matily Herbal Drink and Matily Herbal & Spices Mix to avoid complications connected with COVID-19 re-infection. After completing 12 months of post COVID-19 infection, the antibodies were assessed to find the status. It was found to be increased in qualitative assessment. The quantitative assessment of antibodies showed a much higher value compared with individuals who had both the dose of vaccines and tested the blood after two weeks since the second dose of vaccine. We suggest that the increased antibodies could be because of the bioavailability of polyphenols present in the Matily Herbal Drink and Matily Herbal & Spices Mix. Polyphenols inactivate COVID-19 virus and this may have helped the body to increase its antibody production. The bioavailability of polyphenols depends on various factors, including acidulants in the diet. Based on the present studies, we suggest India should have her own strategies to increase antibodies in the population instead of just following the norms laid by International Agencies for the booster dose of vaccine.

Keywords: COVID-19, Matily Herbal Drink, Matily Herbal, Spices Mix

Introduction:
COVID-19 (SARS-CoV-2), known as coronavirus, is a pandemic and a threat to humans of the World over [1]. It caused deaths to many and, as a measure to prevent the spread of virus, frequent lockdowns were implemented in all countries, leading to huge economic losses to all [2]. A brief review of the disease and the treatment status is discussed elsewhere [3]. The virus causes micro and macro vascular clotting in the infected patients that leads to further complications [4, 5] or infections like pneumonia [6]. Administration of aspirin to the COVID-19 patients showed better recovery [7, 8, 9, 10]. Aspirin is derived from salicylates present in plants [11, 12]. Certain Indian herbs and spices used in Indian cooking are rich in salicylates [13,14] and we proposed that salicylates in Indian diet, open ventilation and early treatment of disease after detection of symptoms may have contributed to the survival of COVID-19 patients in India, though the incidence of disease was high [3]. Recently, in the treatment of COVID-19, anti-inflammatory and anti-viral drugs are suggested [15, 16, 17] and polyphenols, a component in certain diets, especially herbs and spices used cuisine, have these properties [18,19,20]. Polyphenols have a role in
combating the battle against COVID-19 [21, 22,23] and polyphenols are showed to disrupt spike proteins whereby reducing its attachment with ACE2 receptors in host cells [21,24,25].

Prior to the present pandemic, Matily Herbal Drink, a concoction made of ingredients rich in polyphenols like curry leaves (Murraya koenigii), mint leaves (Mentha sp) ginger, (Zingiber officinalis), okra (Abelmoschus esculentus) and lemon (Citrus limon) with salt and sugar for taste, was designed and made to control hyperglycemia and hypercholesterolemia in patients who cannot afford pharmaceutical intervention because of poor economic conditions [26]. The study showed that the drink lowers hyperglycemia, hypercholesterolemia and oxidative stress [26]. It was also effective in treating shingles [27] suggesting its anti-viral activities.

Therefore, we suggested that Matily Herbal Drink could use as prophylactic and treatment for COVID-19 [1]. Later on, Matily Herbal Drink & Spices Mix was developed for reducing complications associated with COVID-19 in the general population [28].

With above presentations in the background, we present the status of COVID-19 antibodies in a 65-year-old male who had natural infections a year ago and was on Matily Herbal Drink during the infection, followed by Matily Herbal & Spices Mix, to avoid any complications in case of COVID19 re-infection.

Case Study

A 65-year-old male with a history of diabetes, global hypokinetic of Left Ventricle of heart (eff <25%) was infected with COVID-19 in early August 2020. On August 4th, the patient noticed throat pain and high body temperature after returning from his work in the evening. He kept his body temperature rising with a cold sponge on his forehead and feet to reduce multiplication of the virus inside the body. The patient knew diabetic condition could aggravate corona infection. So the patient sipped Matily Herbal Drink throughout the night to control hyperglycemia. In the earlier studies, Matily Herbal Drink was shown to control hyperglycemia in the same patient [26]. After 18 hours from the detection of symptoms, his sister, a Registered Nurse working in Miami, Florida, informed that their patients are given Azithromycin 500 mg and suggested taking the same under medical supervision. However, since the patient had low LV function, Azithromycin 250 mg for 6 days been taken. The patient was on a regular vegetarian diet and he recovered completely after 7 days. The infection was confirmed with a qualitative assessment of the antibodies present in the blood (Table 1).

Corona infection caused fluid retention in the body and the patient could not sleep in the night from 12 midnight to till 4 am. The patient used to sit up during this time and slept from 4 am to 9 am. Later on, he was admitted to a hospital to treat fluid retention problems and was on diuretics and medicines for diabetes and hypertension. The patient recovered from all the complications and started his normal life slowly. During the review, the doctor advised him to discontinue his diabetic medicine, and he was only on Dytor 10 mg and Telma 20mg with some multivitamin supplementation.

After the six months of recovery, the patient started taking half teaspoon of Matily Herbal & Spices Mix powder once in a day along with little curd or buttermilk, as a blood thinner to avoid any complications associated with asymptomatic infection of COVID-19. The person moved around, doing his activities every day, following SMS (Sanitation, Mask and Social distancing) norms prescribed by health officials from the government.

In July 2021, the patient visited Kerala in India for some urgent work, where COVID-19 infections were rampant. He travelled to different places in Kerala on public transport
and stayed in public places like hotels and lodges. The rapid antigen test and RT-PCR test were conducted prior to his interstate travels and found to be negative.

By the end of August 2021, after completing 12 months of post COVID-19 infections, qualitative assessment of antibody was carried out by Metropolis Labs, Mumbai [29]. The results were compared with the value got in September 2020, just after the recovery of COVID-19 infection (Table 1). Later on, a quantitative measurement of antibodies was carried out using Covid-protect test performed by Metropolis, Mumbai [29]. The tests were carried out on serum by Enzyme Chemiluminescence Immunoassay. (ECLIA).

### Results

The status of antibodies against COVID-19 produced just after the recovery of the disease and after 12 months is given in Table 1. The results got in the test carried out in September 2020 confirmed that the patient had Covid infection.

#### Table 1. Qualitative assessment of COVID-19 antibodies present in the patient just after the recovery of COVID-19 in September 2020 and after 12 months of post infection.

<table>
<thead>
<tr>
<th>Test</th>
<th>Values obtained on 19th September, 2020</th>
<th>Values obtained on 31st August, 2021</th>
<th>Percentage of difference in values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Qualitative assessment of antibodies</td>
<td>93 (Cut of Index)</td>
<td>137 (Cut of Index)</td>
<td>+47%</td>
</tr>
</tbody>
</table>

Table 1 shows the presence of antibodies against COVID-19 in the patient and there was an increase of antibodies (qualitatively) after 12 months.

The quantitative measurement of antibody titre present in the patient in August 2021 is shown in Table 2. The reported value was 1186 BAU/ml. Since this test was not available in September 2020, the initial antibody titre could not be carried out.

We compared this result with the values got in two individuals who had taken both doses of vaccine and had completed two weeks after the final vaccination (Table 2).

#### Table 2: Quantitative assessment of antibody titres against COVID-19 virus, in the patient under case study and in the two individuals who had taken both doses of vaccine and completed two weeks.

| Quantitative assessment of antibodies in the case study subject | 1186 BAU/ml |
| Quantitative assessment of antibodies in the case 1 subject    | 13 BAU/ml   |
| Quantitative assessment of antibodies in the case 2 subject    | 230 BAU/ml  |

Antibody titre of the two individuals who had both doses of vaccine and time period is 13 BAU/ml and 230 BAU/ml. The antibody titre of the patient under case study was 1186 BAU/ml. A general and informal survey of the values obtained in vaccinated people in the same locality was below 400 BAU/ml. There was an increase of antibodies observed in the case study subject.

#### Discussion

The patho-physiology related to corona infection is discussed in our earlier reviews [3]. Virus enters through the nasal cavity and eyes, uses their spike proteins to attach with the ACE2 receptors in the host cells [30]. Once they enter the cell, they alter the physiology of the cell [31], to stimulate body temperature of the host [32,33]
In the present case study, the timely action taken to lower the body temperature with a cold sponge on the forehead and feet of the patient may have lowered virus load inside the body. Sipping Matily Herbal Drink may have lowered oxidative stress in the patient [26]. The speedy recovery of patients from shingles without taking Acyclovir 800 mg tablets internally because of his poor heart condition, but was only on Matily Herbal Drink, supports the probability of antiviral properties of the drink [27]. The qualitative assessment of antibodies showed presence of antibodies when any foreign organisms or toxins enter the body, antibody production is started inside the body. Thus, COVID-19 antibodies in the patient’s blood show the previous infection. Antibody production is governed by diet, especially proteins and other factors. The patient in the case study had normal activities and ordinary vegetarian meals most of the time. Non-vegetarian items were poultry once in a month and six eggs in a month. Thus, the patient did not have any high protein diet or any protein supplements during the study period. It is also reported that antibodies in patients with post COVID-19 infection declines with time [34,35]. However, it is reported that antibodies last at least a year [36,37].

In the present case study, there was no decline in antibodies tested qualitatively, but on the contrary, increased from 93% to 136%. The quantitative analysis of antibodies showed 1186 Au. We infer that the patient may have asymptomatic re-infection after recovering from the initial infections.

Recently, anti-viral and anti-inflammatory drugs have been recommended for treating COVID-19 [38]. Since polyphenols have anti-viral and anti-inflammatory properties, they are suggested for the battle against Covid-19 [39,40,41,43,43,44]. Gupta et al. demonstrated that secondary metabolites from spices and herbs as potential multi target inhibitors of SARS-CoV-2 proteins’[45]. Therefore, polyphenolic-based medications can mitigate SARS-CoV-2-enzymes, which are vital for virus duplication and infection” was suggested [46, 47].

The ingredients used in Matily Herbal Drink and Matily Herbal & Spices Mix are rich in polyphenols with antioxidants and anti-inflammatory properties. The properties of okra (Abelmoschus esculentus) [48,49, 50, 51] and lemon (Citrus limon) [52,53,54,55, 56, 57, 58] are discussed elsewhere.

The common ingredients in the Matily Herbal Drink and Matily Herbal & Spices Mix were ginger, mint leaves and curry leaves. Ginger is used traditionally in India. Its properties are discussed elsewhere [59, 60]. A recent study showed “the clinical effects of ginger on nausea and vomiting, gastrointestinal function, pain, inflammation, metabolic syndromes, and other symptoms. It was effective in a majority of studies, including those that examined the alleviation of nausea, vomiting in pregnancy (NVP), digestive function, improvement in the expression level of markers for colorectal cancer risk and anti-inflammatory functions,” [61]. Mint has antibacterial and antioxidant activities [62]. Curry leaves, Murraya koenigii, are used in Indian cuisine, are rich in polyphenols and have medicinal properties [63,64,65]. The analysis of various compounds by GC-MS is reported [66]. Its essential oil inhibited xanthine oxidase activity, which caused a decrease in the generation of superoxide radicals [66]. The antioxidant properties of Murraya koenigii leaf essential oil have scope for its use in food industry and medicine [63]. The flavonoids and polyphenols in the plant [66] and their anti-allergic, antioxidant, anti-inflammatory, anti-viral and anti-cancer activities are discussed elsewhere [66].
In the present study, Matily Herbal Drink followed by Matily Herbal & Spices Mix taken daily by the patient may have supplied polyphenols and the anti-viral and anti-inflammatory properties of polyphenols may have inactivated the virus as explained above and helped the patient’s immune system to combat COVID-19 infections. This may explain the relatively high antibody presence in the body compared with vaccinated individuals. The salicylates content in the mixture may have prevented micro blood clots in the body under asymptomatic infections.

In the laboratories, the extraction of polyphenols from food is carried out with alcohol or other organic solvents and varies with extraction methods [67]. The bioavailability of polyphenols from the food is often debated. The bioavailability of polyphenols in the intestine depends on the matrix and it is low because of its hydrophobic nature. However, the bioavailability of polyphenols is increased with acidulants used in Indian cooking [68]. Lemon, tomatoes, tamarind, Malabar tamarind, armchur, curd and buttermilk are used to give sour taste to the food and are acidulants which facilitate increased bioavailability of polyphenols [69]. The microbiome in the intestine produces short-chain fatty acids (SCFA) that favour absorption of the polyphenols [70].

Matily Herbal Drink is prepared by grinding all the ingredients with a quantity of lime juice. This method gives better extraction and favours increased bioavailability of the polyphenols. The Drink gets slightly fermented if kept in the room temperature for 4 to 5 hours and fermentation may favour better bioavailability of polyphenols from the drink. Matily Herbal & Spices Mix is advised to be taken with curd or buttermilk. The lactic acid in the curd and buttermilk may favour the bioavailability of polyphenols [71].

In the light of the present case study, we conclude that the Indian diet is rich in polyphenols [72,73] and the bioavailability of polyphenols Indian cooking increases with the use of acidulants [68]. The increased bioavailability of polyphenols along with salicylates in the Indian diet [3] may have contributed to the survival of COVID-19 patients. The bioavailability of polyphenols from Matily Herbal Drink and Matily Herbal & Spices Mix may have increased because of the presence of acidulants. Polyphenols inactivate the virus, as explained earlier, leading to increased antibody production in the body.

The International agencies are aiming to develop methods to boost antibodies with various vaccines and booster doses. The present study throws some light that a single or double dose of vaccine along with a polyphenol rich diet like Matily Herbal & Spices Mix or even a proper Indian vegetarian diet with acidulated may boost antibody production in the population to combat the present pandemic. Quantification of antibody titre may be a better criterion to confirm the health status of an individual instead of just vaccinations.

**Conclusion**

We conclude polyphenols have a role in combating COVID-19 and the bioavailability of polyphenols depends on various factors, including acidulants, in the diet. In this context, the Matily Herbal Drink and Matily Herbal & Spices Mix with acidulants may boost bioavailability of polyphenols. India should develop her own strategy to increase antibodies in the population instead of just following the norms laid by International Agencies, which are under the influence of pharmaceutical companies.

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The author named the drink as Matily in remembrance of his father, Mr M.E. Eapen (1926-2018), known among his American friends as “MAT” and who continuously encouraged the author to innovate methods to ease the suffering of the afflicted.

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28. [Link to Coviprotect test]


