Immunity Boosting Role of Medicinal Plant and Pranayam: An Alternative Way to Fight Against Covid-19

Subodh Kumar

ABSTRACT

Introduction: COVID-19 mainly target on the immune system. Since there is no vaccine, treatment and etiopathology available for SARS-CoV-2 infection till date, hence the ultimate aim of the present study is to know the effect of immunity boosting herbal supplements with yoga and *pranayam* on different study Groups.

Material and Methods: The study was carried out in Darbhanga Medical College, Laheriasarai. The Study Groups were divided into three groups on the basis of cases (Confirmed case and suspected case). 1st study group (Confirmed COVID-19) were supplemented with initial line of treatment. 2nd study group (Confirmed COVID-19) supplemented with herbal supplements twice in a day and practice of yoga at least one hour per day without any medication. 3rd study group (Suspected cases) were administered similar treatment like 2nd study group. In all groups 1st sample were taken from day zero (0th D) of enrollment. 2nd sample were taken on fourteen days (14th D). In each Sample various Biochemical parameters (Serum MDA, serum hs-CRP and Serum Ferritin) were analyzed.

Results: It was observed that herbal supplemented groups with Yoga and Pranayam gave more beneficial results in comparison to initial line of treatment.

Conclusions: Based on the findings of this study, it was accomplished that regular practice of yoga and use of herbal preparation (*giloy* + *ginger* + *tulsi*) in suggested quantity improve the immunity level naturally with speedy recovery in COVID-19 cases as well as in healthy person and suspected case it minimizes the chance of infection without any side effects.

Keywords: SARS-CoV-2; Physical Distancing; Evidence Based Medicine; Yoga & Pranayam; Immunity Booster Herbs

INTRODUCTION

COVID-19 disease is caused by Corona Virus SARS CoV-2 (+ SS RNA Virus) and it was originated from chiana (Wuhan) in December 2019 [1]. Due to its Pandemic nature it spread around the world very rapidly and affected approx 11.8 million individual worldwide and has resulted in more than 5.45 lakh death (till 9th July 2020). In India approx 7.95 lakh Confirmed case and 21,638 death of COVID -19 were reported till 10th July 2020. Spreading of Corona virus in person to person by several ways viz. droplets, aerosolized transmission, surface transmission, fecal-oral. Covid-19 can affect multiple organs in the body. The organ that gets affected after lungs is the heart. The disruption extends to the blood which causes blood clots. When this breaks, it can restrict blood supply to the brain. In Covid-19 affected individual, the immune system mounts an all-out battle against the virus SARS-CoV-2 which in turn disrupts oxygen (O_2) Transfer and makes breathing difficult, accompanied with cough. The diagnosis of Covid-19 is usually based on detection of SARS-CoV-2 by PCR testing (most commonly Collecting specimens from the surface of the respiratory mucosa with nasopharyngeal swabs).The no. of confirmed cases and deceased cases increases more rapidly day by day. Since there is no effective treatments of COVID-19 available as well as many aspects of the virus and disease are still unclear till date. This burning issue attracts my attention towards present study. Medicinal property (Immunity boosting effect) of some herbs attracts the scientific world to conduct research with herbal preparation. Since COVID-19 mainly target on the immune system hence the ultimate aim of the present study is to know the effect of herbal supplements with yoga and pranayam on different study Groups.

MATERIAL AND METHODS

The study was carried out in Darbhanga Medical College (DMC), Laheriasarai. 30 healthy volunteer, which comprises of faculty members, paramedical staffs and students were serve as a control. In study groups 40 confirmed cases of COVID-19 (symptomatic & asymptomatic) were selected from Corona ward. 33 suspected cases were also selected from different quartine centre, Darbhanga. Informed consent was taken from each subject. Before start work ethical permission were taken from ethical committee of DMC.

Division on groups on the basis of mode of treatment: Study Group was divided into three groups. 1st study group (Confirmed COVID-19) were supplemented with initial line of treatment. 2nd study group (Confirmed COVID-19) supplemented with (100ml Giloy + ginger+ Tulsi kadha) twice in a day and practice of yoga at least one hour per day without any medication. 3rd study group (Suspected cases) were administered similar treatment like 2nd study group.

Method of Kadha Preparation (for 100ml) : In 200 ml water 5 gm. fresh crushed ginger+ 6 gm giloy stem + 10 fresh tulsi

Associate Professor, Department of Biochemistry, Darbhanga Medical College, Laheriasarai, Bihar, India

Corresponding author: Dr. Subodh Kumar, Associate Professor, Department of Biochemistry,Darbhanga Medical College, Laheriasarai, PIN- 846003 (Bihar), India

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leaves were added. Boiled it till half the content remained (approx 100ml) in the pan. Strain it with the help of strainer and warm drink. Take it twice daily

Sample Collection: In all groups 1st sample were taken from day zero (0th D) of enrollment. 2nd sample were taken on fourteen days (14th D). In each Sample various Biochemical parameters (Serum MDA, serum hs-CRP and Serum Ferritin) were analyzed.

Observation & results

After performing various test. Unpaired and paired t-test was applied to analyzed data by using SPSS software.

RESULTS

The most common symptoms observed among people who had COVID-19 (Fever 99%, Fatigue 68%, Cough 60%, Lack of appetite 40%, shortness of breath 25%, phlegm 25%).The increase in the level of Serum Malondialdehyde (MDA), CRP and Ferritin in study group (COVID-19) were found to be highly significant ($p < 0.001$) when these values were compared with control group on zero days (Table 1 & 2). A highly significant ($P < .001$) decrease in Serum MDA, hs-CRP and Ferritin level was observed in Confirmed cases of COVID-19 on 7th days after initial line of treatment as compared to control subjects this indicates improvement (Table 1). Combined effect of Yoga and 100ml kadha supplementation for 14th days in confirmed case of COVID-19, 2nd group produces more significant improvement in Serum CRP, Ferritin and MDA level than 1st group (initial line of treatment) (Table-1 & 2). 3rd group showed less alteration in Biochemical parameters (Serum MDA, Ferritin level) as compared to Group 1st and Group 2nd on day Zero (Table 3). In the present study the change in acute phase proteins (hs-CRP and Ferritin) in case of COVID-19 might be due to increase level of pro-inflammatory cytokine levels during infection (Table 1 & 2).

DISCUSSION: Since there is no medicine, vaccine and effective treatment available till date for the management of SARS-cov-2 and high population burden (1/6th of the world population), it is a big challenge to identify the asymptomatic cases of COVID-19 without increasing the no. of test. Older age group person (>60 years) and children (< 10 years) whose immune system was weak or suffering from any type of disease (like diabetes, Cardiac, Renal, Cancer, Respiratory, TB & AIDS) were more vulnerable group in present study.

1st study group (Gr. I)						
Biochemical Parameter	**0th Day (Mean ± SD)**			**7th Day (Mean ± SD)**		
S. Malondialdehyde (MDA) (nmol/mL)	Control N= 30 0.22 ± 0.14	Study N= 40 0.45 ± 0.16	p-vaue <.001	Control N= 30 0.21. ± 0.32	Study N= 40 0.35 ± 0.22	p-vaue < .001
CRP Leve (µg/ml)	2.85 ± .72	6.20 ± 0.28	< .001	2.23 ± .72	4.01± 0.38	< .001
Ferritin Level (ng/ml)	179.3 ± 40.2	295.31 ± 13.2	< .001	161.31 ± 40.2	212.31 ± 17.2	< .001
Valuess are in Mean ± SD, ** Highly significant p < 0.001, N indicates- No. of cases						

Table-1: Comparision of parameters between control group & study group (Confirmed case of covid-19) with initial line of treatment

2nd Study Group (Gr. II)						
Biochemical Parameter	**0th Day (Mean ± SD)**			**14th Day (Mean ± SD)**		
S. Malondialdehyde (MDA) (nmol/mL)	Control N= 30 0.22 ± 0.14	Study N= 40 0.33 ± 0.24	p-vaue <.001	Control N= 30 0.18. ± 1.36	Study N= 40 0.24 ± 0.12	p-vaue < .001
CRP Leve (µg/ml)	2.85 ± .72	6.10 ± 1.18	< .001	2. 35 ± 1 .72	3.21 ± 0.38	< .001
Ferritin Level (ng/ml)	179.3 ± 40.2	288.21 ± 1.23	< .001	159.31 ± 15.2	178.31 ± 13.2	< .001
Valuess are in Mean ± SD, ** Highly significant p < 0.001, N indicates- No. of cases						

Table-2: Comparison of parameters between control group & study group (Confirmed case of covid-19) with Regular practice of Yoga and Herbal supplements (100ml Kadha)

3rd Group (Gr. III)						
Biochemical Parameter	**0th Day (Mean ± SD)**			**14th Day (Mean ± SD)**		
S. Malondialdehyde (MDA) (nmol/mL)	Control N= 30 0.22 ± 0.14	Study N= 33 0.25 ± 0.21	p-vaue <.001	Control N= 30 0.20. ± 1.15	Study N= 33 0.21 ± 0.12	p-vaue > .05
CRP Leve (µg/ml)	2.85 ± .72	4 .12 ± 1.36	< .001	2. 12 ± 1 .12	3.40 ± 0.38	< .001
Ferritin Level (ng/ml)	179.3 ± 40.2	212.1 ± 1.12	< .001	172.12 ± 12.2	201.31 ± 19.2	< .05
Valuess are in Mean ± SD, ** Highly significant p < 0.001, p < 0.05 significant, p > 0.05 NS, N indicates- No. of cases						

Table-3: Comparison of parameters between control group & study group (Suspected case of COVID -19) On 14th Day with Regular practice of Yoga and Herbal supplements (100ml Kadha)

Study Group with their treatment	hs-CRP	Serum Ferritin	Serum MDA
Gr.1 Confirmed case COVID-19 (7 Days) With Initial line of treatment (Vitamin C 1000mg/day + Zinc 50mg/day + Tab HCQ 400mg BD for day 1, followed by 400mg OD for 4 days + Azithromycin 500 mg OD for 5days)	35.32%	28.13%	22.22%
Gr.2 Confirmed case of COVID -19 (14 days) With regular practice of Yoga at least 1 Hour and Herbal supplements (100ml Kadha twice daily)	47.37%	38.15%	27.27%
Gr. 3 Suspected case COVID-19 (14 days) With regular practice of Yoga at least 1 Hour and Herbal supplements (100ml Kadha twice daily)	17.47%	5.08%	16%

Table-4: Percentage decrease of Biochemical parameter (hs-CRP, Serum Ferritin, Serum MDA) in different study group (starting from day zero)

Medicinal Herb	Property	Mechanism of Action/ Function
Ginger	Anti-infammatory[2,3] (reduces infammation)	By Inhibiting COX-2 and LOX pathways.
	Antioxidant[4] (reduces level of ROS)	By improving the antioxidant status
	Anti-thrombotic[5] (inhibition of platelet function)	
	Immunomodulatory[6] (boost up the immune system of the patients which further prevent load of infection)	Can suppress Th2-mediated immune responses in mouse model
	NF-kB suppressor activity[7]: Ginger has potent NF-kb inhibitory action.	
	Ginger is beneficial in to fight respiratory problems (relieve congestion associated with the common cold), strength immunity (due to high level of anti-oxidant), Relieve stress (due to combination of the strong aroma and healing property), improve blood circulation (due to presence of vitamin, minerals and amino acids in ginger it can help restore and improve blood circulation and prevent fat from deposition in arteries helping to prevent heart from Cardiac Vascular Disorder.	
Giloy	Anti-bacterial[8]	Giloy flush out the AMA toxins from the body and shields the body from various microbial disease.
	Anti-viral[9]	
	Expectorant property	It helps clear mucus and catarrh deposits from the nasal cavities and provides relief from chest congestion
	Immunomodulatory properties[10]	
Tulsi	Antioxidant	By increasing catalase and natural antioxidant SOD (Super Oxide, Dismutase)
	Catalase enzyme is known to play an important role in scavenging reactive oxygen species. CAT decreases the H_2O_2 into water and oxygen to prevent oxidative stress and in maintaining cell homeostasis.	
	Antimicrobial[11], anti-allergic, anti-inflammatory, anti-viral[12] and immunomodulatory[13] (improve immune system against infection) properties.	Fight against common cold[14]

Table-5: Medicinal herb, its property and mechanism of action

(Immunity Boosting Medicinal Herbs Fight Against COVID-19 infection)

Giloy

Tinospora cordifoli
"Rejuvenative herb"
activity"

Tulsi

Oscimum sanctum
"elixir of life"

Ginger

Zingiber officinale
"NF-kB Suppressor

Expectorant property *Improve immune system* *Downregulate IL-6 expression*

+

PRANAYAM (Immune stimulatory effect)

(Regular practice of Yoga & Pranayam at least 1 hour purify your body, increase vital capacity and improve immune system by downregulat IL-6 expression and improving efector function of T-cell)

Figure-a: Medicinal Herb & Pranayam : Immune boosting effect synergestically (Better way to fight against infection)

(Tips useful in fighting against covid -19) **COVID-19 up-regulate NF-kB (Nuclear Factor- kappa Beta)which induces pro-inflammatory cytokine (IL-1, TNF) which is involved in pathogenesis of various diseases. Those substances which control or suppress / down regulate the activity of NF-kB would be helpful in management of inflammation**	
Initial line of Treatment of COVID-19 Ptients	Vitamin C 1000mg/day + Zinc 50mg/day + Tab HCQ 400mg BD for day 1, followed by 400mg OD for 4 days + Azithromycin 500 mg OD for 5days Note: Zinc is necessary for the activity of at least 300 enzymes participates in metabolism and it is critical for the development and function of immune cell. Zinc when combined with Vitamin C reduced the cold and flu duration.
Immuuniy boost up diet	Aanwala (any form), Eat Citrus fruits (Lemon, orange, Malta), strawberries, watermelons, Carrot, Apple, Guava, Papaya, Pomegranate, mushrooms (Contains zinc) dry ginger powder (sonth) often, Garlic, coconut Dav water, vegetables (Broccoli), pulses, Gud, Avoid refined oil, cinnamon, Green leafy tea, Use Antioxidant Vitamin food(Vit.A/ Vit.C /Vit. E)
Regular Yoga and Pranayam Practice for at least 1 Hour	Surya Namaskar, Bhramari Pranayam (enhances expression of NO and increase CO_2 by extended exhalation and alkaline pH prevent coagulopathies in COVID-19 cases)
Avoid	Alcohol (each drink increases chances of getting infection 6 times), oily, spicy, cold drinks, ice cream and fast foods which make you vulnerable for sore throat.
Protect Yourself against COVID-19 infection by using	Sanitization, wear Mask (even at home if having cough, cold) & Maintain, Face shield, Physical distancing (acts as powerful vaccination, it Break the chain)
Clean	Clean your body first with soap and water, because it removes outer coating of bacteria and virus and further kill them. Any soap is more effective than sanitizer in some cases because it remove oily and greasy material from the body, in which microbes and virus may be hidden.
Disinfect material	Use a mix of household bleach and water (1/3 cup bleach per gallon of water, or 4 teaspoons bleach per quart of water) or a household cleaner that's approved to treat SARS-CoV-2. This can be helpful in killing surfaces you touch often, like floor, tables, doorknobs, light switches, toilets, faucets and sinks

Table-6: Some important immunity boosting measures for self-care

Hence immunity contributes their role in strengthening the immune system of the body for fight against infection. Among the COVID-19 patients the most common feature are (Fever, Fatigue, Cough, Lack of appetite, Myalgia, Shortness of breath, Mucus/phlegm). In some cases dangerous blood clots, including in their legs, lungs, and arteries are also reported. It was observed that most of the confirmed cases of COVID-19 patient having mild respiratory infection.

Most of the cases enrolled in the present study group showed alteration in Acute Phase Proteins (hs-CRP & Ferritin) and Serum MDA level on day Zero. In fact this acute phase response is thought to be beneficial to the organism by preventing microbial growth and helping to restore homeostasis. Increased level of Acute Phase Protein is the marker of inflammation, which is associated with the pathogenesis of various diseases. Hence monitoring of hs-CRP level is useful in assessing prognosis as well as clinical improvement. Significantly increased level of serum MDA in COVID-19 patients is the indication of reduction of anti-oxidant status as well as immunity (Table 1,2 &3)

Initial line treatment for 7 days in confirmed case of COVID-19 (Gr. I) showed significant decreased in hs-CRP (35.32%), serum Ferritin (28.13%) & Serum MDA (22.22%) level from day zero (0^{th} D), which showed improvement in clinical feature in Gr. I patients(Table 4). More significant decrease in hs-CRP (47.37%), serum Ferritin (38.15%) & Serum MDA (27.27%) level with high recovery rate were reported in Gr. II patients (herbal supplements with Yoga and Pranayam) (Table 4). The Immune boosting role of ginger, giloy and Tulsi with their mechanism of action is depicted in (Table 5 and Fig a). T –cell play crucial role in antiviral immunity and were negatively correlated with case severity. This clearly indicates that COVID-19 mainly target the immune system. Hence to protect our body from COVID-19 infection, we must improve our immune status by taking diet having Immune boosting effect (Table 5 & 6). Since Indian population used herbal preparation in different form (diet, powder, Tea, Kadha) from a long period of time this is the reason for low mortality rate and high recovery rate as compared to other ethnics. It was observed in all study group (Gr. I, Gr. II & Gr. III), that regular practice of yoga and pranayam at least one hour improves ventilation-perfusion ratio in the lung which in turn increased O_2 uptake, eliminating toxin inside the body and provides relief in shortness of breath in COVID-19 patients. Since yoga stimulate expression of Nitric oxide (NO) which in

turn improves immunity by playing its role (nonspecific host defense) against bacterial, viral, fungal and parasitic infection.

CONCLUSION

Based on the findings of this study, it was accomplished that regular practice of yoga and use of herbal preparation (giloy + ginger + tulsi) in suggested quantity improve the immunity level naturally with speedy recovery in COVID-19 cases as well as in healthy person and suspected case it minimizes the chance of infection.

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