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Research Article

A double-blind, placebo-controlled, randomized clinical trial to evaluate the efficacy and safety of Virulina® along with standard treatment as per hospital protocol for the treatment of novel coronavirus (COVID-19)

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Abstract

Background: There is a high priority for the treatment of mild or moderate COVID-19 in an outpatient setting.

Objective: To test the efficacy, safety and tolerability of Virulina® in mild or moderate COVID-19 patients.

Methods: We carried out a double-blind, placebo-controlled, randomized clinical trial involving adult (18-70yrs) mild or moderate COVID-19 patients, randomized 1:1 on Virulina® (3 gm, maximum 14 days) or placebo respectively along with standard-of-care. The primary endpoint was the time taken for nasopharyngeal swab RT-PCR to test negative. And the average change in the ordinal scale from the baseline scores on the eight-point WHO ordinal scale was assessed.

Results: 30 outpatients were selected between 13 July 2020 to 13 August 2020. 93.33% of Virulina® treated patients were virologically cured compared to 53.33% in the placebo group (p= 0.001). The disappearance rates of major symptoms were significantly high in Virulina® plus standard treatment group compared with standard treatment alone.

Conclusion: Virulina® meets the primary and secondary endpoint criteria and exhibits statistically significant efficacy for mild or moderate COVID-19 patients. It is efficacious, safe, and well-tolerated at the tested dosage of 3gm for a maximum of 14 days.

Keywords: COVID-19; herbal medicine; immunomodulation; clinical trial.

INTRODUCTION:

Beginning in December 2019, a novel coronavirus disease, COVID-19, also referred to as SARS-CoV-2, has caused an international outbreak of acute respiratory illness. The rapid spread of COVID-19 was recognized as a pandemic by the World Health Organization on the 11th March 2020 [1]. This pandemic has affected 216 countries, with more than 700000 fatalities [2]. Currently, there is limited therapy known to mankind due to its broad clinical spectrum of disease severity and fatality.

The studies show that herbal medicine has played an important role in the management of infectious diseases. Clinical evidence from a range of studies of herbal medicine in the treatment of SARS coronavirus (SARS-CoV) has shown significant results and supported the idea that herbal medicine has a beneficial effect in the treatment and prevention of epidemic diseases [3]. A Cochrane systematic review reported that herbal medicine combined with Western medicine may improve symptoms and quality of life in SARS-CoV patients [4]. A recently conducted meta-analysis also concluded that herbal medicine could reduce the infection rate of H1N1 influenza [5].

Thus, herbal medicine can be considered one of the alternative approaches to the treatment of COVID-19. In China, the National Health Commission has issued guidelines on herbal medicine-conjugated Western medicine therapy as a treatment for COVID-19 [6]. To date, there is clinical evidence that reports favourable effects of the usage of herbal medicine in the treatment of COVID-19 [7]. Several systematic reviews that included evidence from case reports, case series, and observational studies have also been conducted to study herbal medicine's effectiveness in treating COVID-19 [8–10].

The test product Virulina® is a mixture of some herbal remedies known for their immunostimulant/ immunomodulator properties [11-14]. It can produce synergistic anti-viral effects which might provide some aid in the treatment and prevention of COVID-19 [15-18].

The present study aims to evaluate the efficacy and safety of the test product Virulina® in the treatment and prevention of

COVID-19 if given along with the standard treatment as per the hospital protocol.

MATERIALS AND METHODS:

Study design and participants:

This was a double-blind, placebo-controlled, randomized, two-arm clinical study. 30 numbers of subjects were enrolled in the trial. The study protocol was reviewed by the Institutional Ethics Committee (IEC), Government Medical College & Government General Hospital, Srikakulam, Andhra Pradesh. [CTRI Registration no: **CTRI/2020/06/025556** (Registered on: 02/06/2020)]. The study was performed in accordance with the current version of the Declaration of Helsinki (Brazil, 2013) and in compliance with the current ICMR Guidelines for Biomedical Research on Human Patients, Schedule Y (amended version 2015) of the Drug and Cosmetics Act, ICH GCP Guidelines and other applicable regulatory guidelines. Written informed consent was obtained from the subject(s) before the start of the trial and after the approval from IEC. Ethics Committee notifications as per the GCP guidelines issued by the Central Drugs Standard Control Organization (CDSCO) and ethical guidelines for biomedical research on human subjects issued by the Indian Council of Medical Research (ICMR) were followed during the conduct of the study.

Participants:

Participants were men and non-pregnant women with COVID-19 who were aged between 18-70 years and were RT-PCR positive for SARS-CoV-2 they had symptoms including cough, fever with or without chills and difficulty in breathing (time interval between symptoms onset and randomization not to be more than 7 days). Key inclusion criteria include patients presenting severe multisystemic symptoms compatible with advanced COVID-19 and intercurrent acute or severe chronic diseases (active cancer, etc.), presence of acute hypoxic respiratory failure, intensive care unit (ICU) stay requirement for management of ongoing clinical status, severe infection defined as the need for invasive or non-invasive ventilator support, inability to intake or tolerate oral medication and pregnant women. The dosage of Virulina® used in the study was 3g, administered orally 3 times a day for 14 days. The dose was selected based on the results of previous trials/studies in which the composition of this formulation had been reported to show anti-viral and immunomodulator activities that help in alleviating flu symptoms.

Randomization and Masking:

Eligible participants were centrally randomized using an interactive web response system 1:1 to provide treatment with Virulina® or placebo groups. The randomization was masked to study participants, the sponsors, investigators, study monitors and laboratory personnel until the database was locked.

Study procedures:

Patient's assessments included RT- PCR, done to detect SARS-CoV-2 RNA. Vital signs (body temperature, blood pressure, respiration rate) and adverse events were recorded. Blood samples were collected on days 1, 7, and 14 to measure complete blood count, ESR, serum sodium and potassium, random glucose, BUN, creatinine, serum hs-CRP, AST/SGOT, ALT/SGPT, and tested for pregnancy. Demographic information included fixed race and ethnicity categories to evaluate potential variations in disease severity and treatment response.

Endpoints and safety analysis:

Primary endpoint:

This includes the time until cessation of oral shedding of SARS-CoV-2 (coronavirus 2). Clinical cure based on the clinician's assessment of symptoms which included cough relief, recovery from fever, and difficulty in breathing for the period they were in quarantine. Time points were Day 1, Day 7, and Day 14.

Secondary endpoint:

Improvement was tested in the clinical lab variables including total leucocyte count, absolute leucocyte count, ESR, erythrocyte count, and hs-CRP baseline to the end of the quarantine period of 14 days. Subject global assessment of symptoms like cough, fever with or without chills, body pain and difficulty in breathing (Timepoints chosen: Daily from Day 1 to Day 14). Data was collected for mortality rates, invasive/non-invasive ventilation, ICU and post-anaesthesia care unit admission, hospitalization, medical consultation, home care and isolation time, bed rest, symptom duration (cough, fever, nasal congestion, gastrointestinal symptoms, fatigue, anosmia, ageusia, diarrhoea, or any other COVID-19 symptom), and subjective recovery perception through a questionnaire.

Statistical analysis:

To independently evaluate the results obtained, statistical data processing was performed. A primary database was created in Microsoft Excel using registration forms from the study sites. Data was processed using SAS 9.1 software. All deviations from the final version of the statistical analysis plan were described and substantiated in the final report. Subsequent analysis was documented in the statistical report. Descriptive statistics were presented for all efficacy and safety indicators gathered during the study. Normal distribution was tested using standard methods such as Shapiro-Wilk and Kolmogorov-Smirnov tests. Nonparametric methods were used to compare efficacy and safety indicators if the distribution was non-Gaussian.

Depending on the variable type, demographic data (age and sex) and baseline were presented either as mean, standard deviation, median, interquartile range, minimum and maximum or as frequency and percentage. To test hypothesis of homogeneity of groups at baseline, absence of differences between groups with Student's t-test (for interval parameters with normal distribution in the population under consideration), Mann–Whitney U test (for ordinal interval parameters with non-normal distribution) or $\chi 2$ test (for attributes). In case statistically significant differences were found, differences between treatment groups were estimated using confidence intervals.

RESULTS:

Patients were recruited into the trial and randomized into Virulina® + standard of care or Placebo + standard of care. All 30 patients remained in the study until its completion.

The screening collected demographic data including race, age, gender, height, weight, food habits, and living status. 15 participants (mean age 39 years) received Virulina® + standard treatment and another 15 (mean age 40.6 years) received placebo + standard therapy. There were no significant differences between the two groups in terms of demographics, vital signs, or baseline data as observed in Table 1.

Table 1: Demographic characteristics and vital signs at screening.

Sl.no	Demographics/Vitals	Virulina® + Standard treatment (N=15)	Placebo + Standard treatment (N=15)
1	Sex		
	Male	8	8
	Female	7	7
2	Age	39±9.8	40.60±9.42
3	Height	155.80±7.77	159.87±7.69
4	Weight	59.93± 6.5	66.13± 7.3
5	BMI	24.79 ± 3.12	25.87 ± 2.18
6	Systolic BP (mmHg)	121.53± 3.04	114.80 ± 28.83
7	Diastolic BP (mmHg)	78.13 ±3.76	78.13 ± 5.55
8	Pulse rate/bpm	72.93± 5.86	75.73 ± 3.24
9	Respiratory rate/min	15.71 ± 0.61	15.93 ± 0.7
10	Body temperature	98.81 ± 0.57	98.83 ± 0.52
11	Blood oxygen saturation (SpO_2)	93.53 ± 2.36	92.86± 2.44

At baseline, out of 30 patients, 3 patients were hypertensive and one patient had Type 2 diabetes in which two hypertensive patients were in the test group and 1 hypertensive patient was in the control group. The patient with diabetic history was randomized to the test group.

The proportion of patients that had negative RT-PCR results in nasopharyngeal samples significantly differed between Virulina® + standard treatment treated patients and placebo + standard treatment at 14 days post-inclusion.

At day 14 post-inclusion, 14 out of 15 patients of Virulina® + Standard treatment treated patients were virologically cured compared to 8 out of 15 patients in the placebo + Standard treatment group (p= 0.001). 93.33% of Virulina® treated patients were virologically cured compared to 53.33% in the placebo group (p= 0.001). (Fig 1).

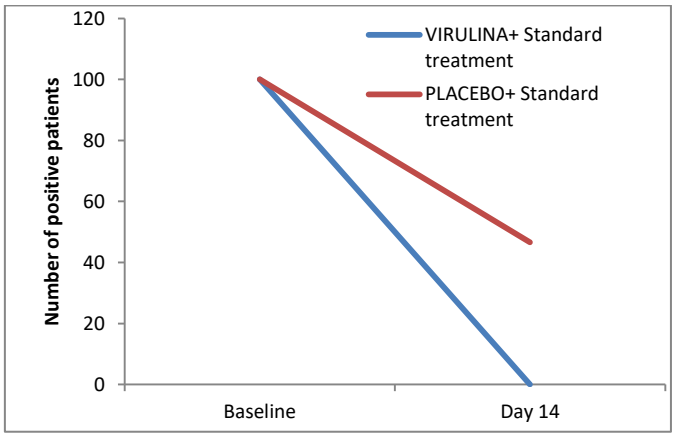

Figure 1: Number of positive patients using RT-PCR at baseline and Day 14 after treatment with Virulina® + Standard treatment and placebo + Standard treatment group.

The major symptoms were reduced significantly in Virulina® + standard treatment group compared with standard treatment alone.

The initial mean scores for symptoms like cough, fever, shortness of breath, chest congestion, nasal congestion, diarrhoea and other GI symptoms, anosmia, ageusia, fatigue, neuro-disorders like myalgia, and sleep disorder, rhinorrhoea, expectoration, sore throat and vomiting were 0.53, 0.47, 0.2, 0.47, 0.27, 0.47, 0.4, 0.67, 0.33, 0.47, 0.6, 0.53, 0.67, 0.67, 0.4, 0.67 and 0.53 when compared to 1.73, 1.8, 1.67, 1.6, 1.73, 0.93, 1.47, 1.67, 1.13, 1.13, 1.13, 1.33, 1.33, 1.2, 1.67, 1.13 and 1.13 at day 14, respectively.

Patients showed nearly no or highly reduced symptoms of cough, fever, shortness of breath, chest congestion, nasal congestion, diarrhoea and other GI symptoms, anosmia, ageusia, fatigue, neuro-disorders, myalgia, sleep disorder, rhinorrhea, expectoration, sore throat and vomiting after treatment with Virulina® and standard treatment group when compared to that of patients in the placebo and standard treatment group at Day 14. (Table 2).

Table 2: Clinical symptom assessment from Day 1 to Day 14 between Virulina® plus standard treatment and Placebo plus standard treatment groups in Covid 19 patients.

Symptoms	Virulina® + Standard treatment (N=15)			Placebo + Standard treatment (N=15)		
	Baseline	Day 7	Day 14	Baseline	Day 7	Day 14
Cough	26.67	66.67	93.33	33.33	40.00	53.33
Fever with or without chill	26.67	33.33	73.33	26.67	33.33	40.00
Shortness of breath	26.67	40.00	53.33	33.33	40.00	40.00
Chest congestion	26.67	66.67	93.33	26.67	26.67	33.33
Nasal congestion	33.33	73.33	100.00	26.67	33.33	40.00
Diarrhoea	26.67	53.33	80.00	26.67	33.33	40.00
Other GI symptoms	26.67	60.00	86.67	33.33	26.67	33.33
Anosmia	33.33	86.67	100.00	26.67	33.33	33.33
Ageusia	26.67	73.3	100.00	33.33	40.00	33.33
Fatigue	33.33	80.00	66.67	33.33	26.67	33.33
Neuro-disorders	73.33	86.67	100.00	33.33	26.67	26.67
Myalgia	33.33	46.67	86.67	33.33	40.00	26.67
Sleep disorders	26.67	80.00	100.00	40.00	40.00	40.00
Rhinorrhoea	33.33	73.33	93.33	40.00	40.00	33.33
Expectoration	26.67	73.33	93.33	40.00	26.67	26.67
Sore throat	26.67	73.33	100.00	26.67	53.33	60.0
Vomiting	26.67	73.33	93.33	33.33	26.67	33.33

Duration of symptoms:

It was observed that the duration of symptoms was reduced significantly in Virulina® with standard treatment compared to placebo and standard treatment group. The duration of cough in the Virulina® with standard treatment group was 5.28 days when compared to placebo with standard treatment group of 8.94 days and found to be statistically significant. The duration of fever with or without chill in the Virulina® with standard treatment group was 5.28 days when compared to placebo with standard treatment group of 8.94 days and was found statistically significant. The duration of shortness of breath in the Virulina® with standard treatment group was 5.22 days when compared to standard treatment group of 9.5 days and found statistically significant. The duration of chest congestion and nasal congestion in the Virulina® with standard treatment group was 5.89 days when compared to Placebo with standard treatment group of 9.78 days and was found statistically significant. The duration of fatigue in the Virulina® with standard treatment group was 5.89 days when compared to placebo with standard treatment group of 9.39 days and found statistically significant. The duration of other symptoms diarrhoea, other GI symptoms, anosmia, ageusia, neuro disorder, myalgia, sleep disorder, rhinorrhoea, expectoration, sore throat and vomiting in the Virulina® treated group were 5.5, 5.17, 5.17, 5.89, 5.28,5.28, 4.72, 5.22, 5.89, 5.17 and 5.5 days when compared to standard treatment group of 10.11, 10.11, 10.28, 10.0, 9.39, 9.72, 8.94, 11.94, 9.5, 9.78, 9.67 and 10.11 days, respectively and found statistically significant (Fig 2). 93.33% of patients were improved pulmonary results in chest X-ray of Virulina® with standard treatment group when compared to 46.67% of patients treated with Placebo plus standard treatment group. The mean results of hs-CRP were 8.07, 5.27 and 3 and 7.93, 7.13 and 7.20 at baseline, Day 7 and Day 14 in Virulina® with standard treatment when compared with placebo with standard treatment. The increased rates of total leukocyte test, platelets, neutrophils and lymphocytes and the reduction rate of erythrocyte sedimentation rate were favourable to results obtained with Virulina® with standard treatment group when compared to that of placebo with standard treatment (Table 3). Subject global assessment of symptoms was significantly improved in Virulina® + Standard treatment group when compared to Placebo + Standard treatment group (Table 4). Reduction of hospital admissions and medical consultations needed after discharge were seen in Virulina® + Standard treatment group when compared to Placebo + Standard treatment group. Similarly, reduction of home care and isolation time and bed rest time were observed in Virulina® + Standard treatment group when compared to Placebo + Standard treatment group. Subject perception of recovery was excellent in Virulina® + Standard treatment group when compared to Placebo + Standard treatment group.

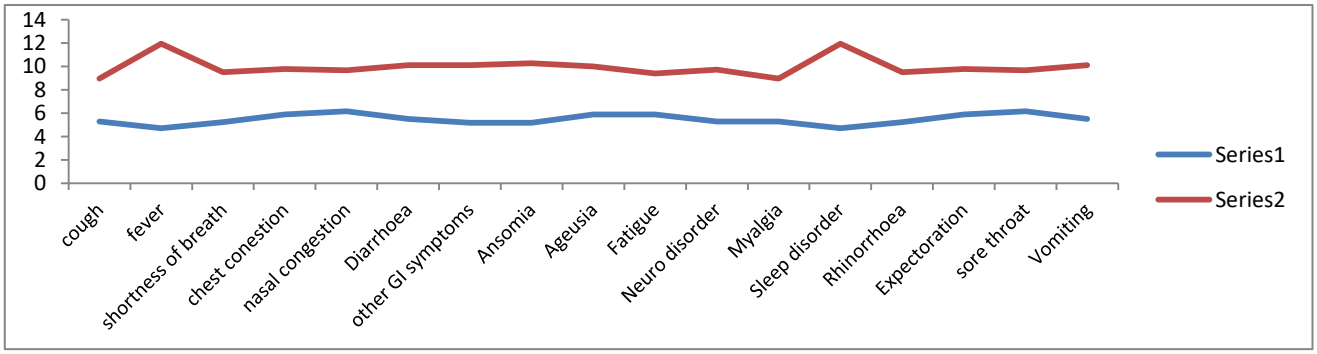

Figure 2: Mean symptoms duration in days in Virulina® with standard treatment group when compared to Placebo with standard group (Series 1: Virulina® + Standard Treatment, Series 2: Placebo + Standard treatment)

Table 3: Haematology evaluation

Lab test	Virulina® + Standard Treatment (N=15)			Placebo + Standard treatment (N=15)			P-value
	Baseline	Day 7	Day 14	Baseline	Day 7	Day 14	
Haemoglobin	12.14± 1.14	12.23±1.49	12.14 ±1.31	12.21 ±1.60	12.28 ±1.48	12.07 ±1.28	0.6
RBC	3.63± 0.31	3.59 ±0.32	3.55 ±0.35	3.65 ±0.34	3.61 ±0.31	3.65 ±0.28	0.8
Total Leucocyte count	7360±965.6	8220 ±990	9627.3±1189	7352.14±1378	7560±1494.6	7566.6±1268.6	0.06
Platelets	2.25± 0.35	2.75 ±0.66	3.12± 0.80	2.18± 0.25	2.16 ±0.23	2.10± 0.11	0.04
MCV	79.93± 4.38	79.67±3.56	80.27 ±4.04	79.07 ±3.79	78.87 ±1.51	78.93± 3.01	0.4
ESR	19.87 ±4.98	12.87±4.50	8.93 ± 4.60	19.57 ±4.52	16.13± 4.63	19.09 ±3.37	0.02
Neutrophils	59.87 ±2.47	61.87±1.85	73.53 ±1.55	59.43 ±1.7	50.67± 2.64	40.80± 2.04	0.02
Lymphocyte	28.33 ±1.76	38.27±2.12	38.4 ±2.23	29.43 ±2.38	28.80± 2.34	29.4± 2.5	0.03
Eosinophil	8.87 ±1.88	5.30 ±1.40	3.73 ±1.62	8.43± 1.55	5.9 ±1.03	4.8 ±0.86	0.04
Basophils	0.13 ±0.35	0.27 ±0.46	0.4 ±0.5	0.21 ±0.43	0.2 ±0.41	0.4 ±0.51	0.07
Monocytes	2.80 ±1.47	4 ±1.51	3.93 ±1.44	2.50± 1.4	4.4 ±2.06	4.6 ±2.03	0.8

Table 4: Subject's Global assessment of symptoms in number of patients (% of subjects) in Virulina® plus standard treatment group when compared with Placebo plus standard treatment.

Symptoms	Virulina® + Standard Treatment (N=15) Mean score			Placebo + Standard treatment (N=15) Mean score			P-value
	Baseline	Day 7	Day 14	Baseline	Day 7	Day 14	
Cough	7(46.67)	7 (46.67)	13 (86.67)	9 (60)	8 (53.33)	7(46.67)	0.03
Fever with or without chill	9(60)	12 (80)	15 (100)	8 (53.33)	11 (73.33)	9 (60)	0.02
Difficulty in breathing	9(60)	11(73.33)	15 (100)	7 (46.67)	8 (53.33)	7 (46.67)	0.02
Body pain	10 (66.6)	15 (100)	15 (100)	9 (60)	8 (53.33)	10 (66.6)	0.04
Nasal congestion	9 (60)	13 (86.67)	15 (100)	9 (60)	8 (53.33)	7 (46.67)	0.02
Gastrointestinal symptoms	9 (60)	15 (100)	15(100)	8 (53.33)	7 (46.67)	7 (46.67)	0.02
Fatigue	7(46.67)	9(60)	12(80)	9(60)	8(53.33)	6(40)	0.02
Headache	7(46.67)	15 (100)	15 (100)	6 (40)	8(53.33)	9(60)	0.04

Safety:

No serious adverse events were reported. The adverse events reported were 1 and 5 in Virulina® plus standard treatment group and placebo plus standard treatment group respectively. All AEs are self-resolved. No changes in the biochemical lab tests like random blood sugar, Serum Sodium, BUN, Test Protein, SGPT, SGOT and serum creatinine at baseline, Day 7 and Day 14. All urine analysis tests at baseline, Day 7 and Day 14 were normal. ECG evaluations in both groups at baseline and Day 14 were normal in all subjects. All vital findings like pulse rate, respiratory rate and blood pressure were normal at baseline, Day 7 and Day 14 in both groups. The oxygen saturation was improved significantly from 94.2 to 97.4 in Virulina® + standard treatment group when compared to the placebo + standard treatment group from 93.26 to 94.93. All subjects were normal and resolved all the symptoms on Day 28 in both the groups.

DISCUSSION:

The COVID-19 pandemic continues with surges caused by SARS-CoV-2 variants, and hospitalizations posing a major threat to healthcare systems in many countries. Despite the development of vaccines which are now being distributed, widespread vaccination will need time to be implemented worldwide and will not fully prevent infection. Thus, there is a critical need for a safe, easy-to-administer antiviral therapeutic that can be distributed through pharmacies and administered early for the treatment of mild or moderate COVID-19.

We reported a randomized, double-blind, placebo-controlled trial conducted at 30 out-patients, Government Medical College and Government General Hospitals, Srikakulam, Andra Pradesh, India between 13 July 2020 to 13 August 2020. The study selected a concurrent placebo-control and registered participants of at least 18 years of age, with mild or moderate COVID-19 infection. Participants were registered based on symptoms to ensure early treatment, avoiding limitations associated with availability and delays in diagnostics testing and 30 participants with confirmed SARS-CoV-2 infection were examined for effectiveness. The trial was suitably blinded and participants were closely followed for 14 days. The trial endpoints were objective and well-defined and rigorous data collection procedures were employed.

In the present trial, the primary endpoint involving asymptomatic and mild patients was time to nasopharyngeal swab negativity by the two RT-PCR tests for SARS-COV-2 antigens taken for 24 hours apart from the date of randomization. The secondary endpoint was the average change in the ordinal scale from the baseline scores from randomization on the eight-point ordinal scale as defined by WHO.

In the mild to moderate patients' group (n=30), there was no statistically significant difference between the two groups in terms of age, height, weight, BMI, other demographic variables, temperature, blood pressure, heart rate, blood oxygen saturation and other baseline data, and they were comparable.

At day 14 post-inclusion, 14 out of 15 patients of Virulina®) + Standard treatment treated patients were virologically cured compared to 8 out of 15 patients in the placebo) + Standard treatment group (p= 0.001). 93.33% of Virulina® treated patients were virologically cured compared to 53.33% in the placebo group (p= 0.001).

The disappearance rates of major symptoms were significantly high in Virulina® plus standard treatment group compared with standard treatment alone.

Duration of symptoms was reduced significantly in Virulina® with standard treatment compared to Placebo and standard treatment group. The duration of cough and fever with or without chill was reduced in 5.28 days and 8.94 days in Virulina® with standard treatment compared to Placebo group respectively. The duration of shortness of breath and chest and nasal congestion reduced in 5.22 days and 5.89 days in Virulina® with standard treatment respectively and 9.5 and 9.78 days in the Placebo group respectively and found statistically significant. The duration of other symptoms diarrhoea, other GI symptoms, anosmia, ageusia, neuro-disorder, myalgia, sleep disorder, rhinorrhoea, expectoration, sore throat and vomiting in the Virulina® treated group were 5.5, 5.17, 5.17, 5.89, 5.28,5.28, 4.72, 5.22, 5.89, 5.17 and 5.5 days when compared to the standard treatment group of durations 10.11, 10.11, 10.28, 10.0, 9.39, 9.72, 8.94, 11.94, 9.5, 9.78, 9.67 and 10.11 days, respectively and found statistically significant. 93.33% of patients showed improved pulmonary results in chest x-ray of Virulina® with standard treatment group when compared to 46.67% of patients treated with Placebo plus standard treatment group. The mean results of hs-CRP were 8.07 and 5.27, 3 and 7.93, 7.13 and 7.20 at baseline, Day 7 and Day 14, respectively, in Virulina® with standard treatment and Placebo with standard treatment. The increased rates of total leukocyte test, platelets, neutrophils and lymphocytes and the decrease in erythrocyte sedimentation rate in the Virulina® plus standard treated group when compared with placebo plus standard treatment. Subject global assessments of symptoms were significantly improved in Virulina® + Standard treatment group when compared to Placebo + Standard treatment group. Subject perception of recovery was excellent in the Virulina® + Standard treatment group when compared to Placebo + Standard treatment group.

Exploratory analyses from early studies of the monoclonal antibodies, bamlanivimab and casirivimab plus imdevimab, in treating mild or moderate COVID-19 led to the assumption of an efficacy endpoint concentrated on proportions of emergency room visits or hospitalizations within 28 days. The observed proportions experiencing hospitalization or death in those studies were 1/101 (1.0%) for bamlanivimab (700 mg)-treated participants compared to 9/156 (5.8%) for placebo-treated participants (p = 0.09), an 83% relative reduction, and 4/215 (1.9%) for casirivimab/ imdevimab (2400 mg)-treated participants compared to 10/231 (4.3%) for placebo-treated participants (p = 0.18), a 57% relative reduction. Based on their data, these products were made available under emergency use authorization in the United States [19-22].

A wide range of studies of these and other monoclonal antibodies had established their effectiveness with an observed reduction in COVID-19-related hospitalization or death compared to placebo in the range of 70%. In those follow-on studies, the endpoint used to assess remedial for treating mild or moderate COVID-19 has progressed to proportions of participants involving hospitalization or all-cause death within 28 days, and patient populations had focused on participants with risk factors for severe illness.

So, from the above studies, it was inferred that Virulina® showed no hospitalization after 14 days of treatment and the follow-up after 28 days showed that all the subjects were normal and all the symptoms were resolved.

CONCLUSION:

In conclusion, Virulina® with standard treatment is effective in virological and clinical relief from its symptoms when compared to the placebo + Standard treatment group. It is also apparent that it reduces inflammation and enhances the immune parameters when compared to the control group. There were no reports of adverse events. The intake of formulation reduces home care isolation time, medical consultations and hospital admissions. It also improved the subjective assessment of symptoms and subject perception scores were found to be excellent.

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CTRI Number: CTRI/2020/06/025556

Study Centre: Government Medical College & Government General Hospital, Dept. of General Medicine, Room no 13, First floor, Shanti Nagar Colony, Balaga, Srikakulam, Andhra Pradesh 532001, India.

Protocol Number: PHAR/CT/VIRULINA/COVID/10052020;
Version 01: Dated 11 May 2020

Conflicts of interest: There are no conflicts of interest.

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