

Effectiveness of Polyherbal Topical Oil Treatment for Patients either with 'COVID-19 like Symptoms' or 'COVID-19 Positive': A Prospective Study

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Abstract

COVID-19 also designated as SARS-CoV-2 is a beta-coronavirus which is now a pandemic disease with no current treatment except some therapies with low quality of evidence or without clinical support study specifically for COVID-19. Extant literature signifies that polyherbal solutions are one of the reliable alternative solutions. Therefore, the aim of this study was to evaluate the effectiveness of treatment with topically applied two polyherbal oil blends; viz. SAV and WMB along with standard treatment in patients having 'COVID-19 like symptoms' (COVID-19 status unknown) and 'COVID-19 positive' patients. SAV with 13 anti-viral compounds (identified through GC-MS) and WMB with anti-inflammatory action for pulmonary/respiratory relief (supported with GC-MS) are found effective to provide treatment for COVID-19 to 44 'COVID-19 positive' patients and 1238 patients having 'COVID-19 like symptoms'. It is identified that SAV and WMB polyherbal blends can be an effective remedial measure for COVID-19, which can be further proven with advanced lab-testing or clinical trials.

Keywords: COVID-19; SARS-CoV-2; Infectious Bronchitis Virus**Received:** August 25, 2020; **Accepted:** September 12, 2020; **Published:** September 21, 2020

Introduction

In late December 2019, a cluster of patients was admitted to hospitals with an initial diagnosis of pneumonia of an unknown aetiology in Wuhan, Hubei province, China which was later confirmed as coronavirus disease 2019 (COVID-19) [1]. Coronavirus is one of the major pathogens that primarily target the human respiratory system. Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a novel strain of corona virus which causes coronavirus disease 2019 [2]. Previous outbreaks of coronaviruses (CoVs) include the severe acute respiratory syndrome (SARS)-CoV and the Middle East respiratory syndrome (MERS)-CoV which have been previously characterized as agents that are a great public health threat. COVID-19 also designated as SARS-CoV-2 is a beta-coronavirus which has proclaimed itself as a pandemic disease with no current treatment or prophylaxis with established evidences; except several therapies, including remdesivir, hydroxychloroquine and chloroquine, and interleukin (IL)-6 inhibitors, which are being used as off-label and evaluated in ongoing clinical trials. However, conclusion cannot be drawn

regarding the efficacy and safety of these treatments for COVID-19, due to low quality of evidence and wide heterogeneity of interventions and indications [3].

The most common symptoms of COVID-19 illness are cough and shortness of breath or difficulty breathing or at least two of the following symptoms: fever, chills, repeated shaking with chills, muscle pain, headache, sore throat and loss of taste or smell [4]. Till date Real-Time Reverse-Transcriptase Polymerase Chain Reaction (rRT-PCR) serves as the gold standard method to confirm the infection of SARS-CoV-2, yet several recent studies have reported false-negative results of rRT-PCR [5]. Thus, it is the urgency to identify the potential drug with wider safety profile and as well as efficacious to treat COVID-19.

The current study is about the two polyherbal oil-blends, which are referred as Sudarshan-AV (SAV) and Whiff-MB (WMB). Studies signify that herbal solutions are one of the reliable complementary and alternative solutions [6]. The same may be used in combination with other conventional treatments to provide support/ additional benefits or can be used as stand-

alone treatment. Existing literature denotes that polyherbal formulations normally result in more benefits in contrast to single herbal formulations. As per Sarangdhar Samhita, the synergistic effect due to polyherbal formulations results in high effectiveness to treat number of diseases. Further, the synergistic effect comes in play due to dual mechanism of effective absorption and operationalization of polyherbal bio-medicine to fight disease causing agents [7]. In consideration of the same, the two polyherbal oil blends (SAV and WMB) are 100 percent natural plant/herb-oil/extracts and require only topical application. Thus, the aim of this study was to evaluate the effectiveness of treatment with topically applied oils; viz. SAV and WMB along with standard treatment in patients having 'COVID-19 like symptoms' (COVID-19 status unknown) and 'COVID-19 positive' patients.

Materials and Methods

The polyherbal oil-blends

Sudarshan-AV (SAV): The polyherbal SAV oil blend was prepared using the plant/herb-extracts/oils of the following: *Origanum majorana*, *lavandula stoechas*, *mentha piperata*, *caryophyllus*

aromaticus, *ocimum basilicum*, *tracyspermum ammi*, *citrus medica*, *mentha viridis*, *origanum vulgare*, *thymus serpyllum*, *cocos nucifera*, *helianthus annuus*, *sesamum indicum*, *allium sativum*, *pimpinella anisum*, *brassica campestris*. The SAV was subjected to Gas Chromatography-Mass Spectroscopy (GC-MS) analysis and was found with strong evidence of anti-viral, anti-bacterial and anti-inflammatory properties (**Table 1**). The SAV GC-MS indicated 13 compounds providing anti-viral function (**Table 2**). The additional benefits of most of these 13 compounds are desirable in terms of either anti-microbial/anti-inflammatory or both [8-34].

The 13 compounds exhibit anti-viral property as indicated by the extant literature. Benzyl alcohol is identified in SAV with a high amount (12.29%). Benzyl alcohol is identified with virucidal activity against those viruses which get transmitted from person to person or from person to object to person through hands. Further, benzyl alcohol is invented to be used in topical form for neutralizing or destroying viruses. At the time of research in 1978, benzyl alcohol was tested against three strains of rhinoviruses, Herpes Simplex Virus (HSV) type 1 and 2 and two strains of influenza viruses [20]. The presence of 1,8-Cineole is

Table 1 Retention time and % peak area of anti-viral compounds in SAV GC-MS.

S. No.	R Time (minutes)	Name of the compound	% Peak Area
1	7.314	α -Pinene	2.18
2	8.929	β -Pinene	1.22
3	10.547	α -Terpinene	0.16
4	10.967	para-Cymene	2.45
5	11.190	Limonene	3.35
6	11.321	1,8 Cineole	4.86
7	12.133	Benzyl Alcohol	12.29
8	12.472	γ -Terpinene	3.81
9	20.768	Neral	1.95
10	22.247	Geranial	3.23
11	23.192	Anethole	8.59
12	23.707	Thymol	2.71
13	26.098	Eugenol	7.32
14	28.410	Caryophyllene	1.39
15	33.880	Cinnamaldehyde	0.55

Table 2 Additional properties of anti-viral compounds identified in GC-MS of SAV polyherbal oil blend.

S. No.	Main Compound	Anti-Viral	Anti-Bacterial	Anti-Inflammatory
1	Pinene	✓ [8]	✓ [9]	✓ [10]
2	Terpinene	✓ [11]		✓ [12]
3	Cymene	✓ [13]	✓ [14]	✓ [15]
4	Limonene	✓ [8]		✓ [16]
5	1,8 Cineole	✓ [17]	✓ [18]	✓ [19]
6	Benzyl Alcohol	✓ [20]	✓ [21]	
7	Neral/Citral	✓ [22]	✓ [23]	✓ [24]
8	Geranial	✓ [25]		✓ [26]
9	Anethole	✓ [27]		✓ [27]
10	Thymol	✓ [28]	✓ [29]	✓ [30]
11	Eugenol	✓ [31]		✓ [31]
12	Caryophyllene	✓ [32]		✓ [33]
13	Cinnamaldehyde	✓ [34]		

Note: ✓ indicates property is present and blank space shows property is absent in the compound.

studied to interfere the RNA bindings. It commendably explains that the inhibition of 1,8-Cineole against Infectious Bronchitis Virus (IBV) occurs strongly after penetration of the virus into the cell. It was found that the key active-site residues are fully or partially conserved. It indicates the 1,8-Cineole not only inhibits the N-protein of IBV Gray strain, but also other known strains. 1,8-Cineole possesses anti-IBV properties via embarrassing the binding process between RNA and IBV N-protein [17]. 1,8-Cineole and Citral are found effective on RNA enveloped virus. Citral-inhibited yellow fever virus (YFV), and the compound presented promising activity *in vitro* (SI of 12.9) against Herpes Simplex, another enveloped virus [21-23].

Pinene and Limonene compounds inhibit specifically the viral DNA polymerase during the replication cycle when new viral DNA is synthesized [8]. Eugenol can cause damage to viral envelopes of freshly formed virions and can cause inhibition of viral replication at the initial stage. Direct inactivation of viruses and inhibition of intracellular and extracellular viruses after replication were observed with eugenol [24-31]. Caryophyllene interferes with virion envelope structures or mask viral structures that are necessary for adsorption or entry into host cells [32]. Geranial works by coating the capsid and thereby preventing specific adsorption of the virus to host cells [25]. Cinnamaldehyde decreases the apoptosis level; inhibiting the caspase-3, caspase-8, caspase-9 protein expression [33,34]. Anethole exhibits anti-viral activity by direct inactivation of free virus particles [27].

The inhibition of HSV by Terpinene and p-Cymene appears to occur before adsorption but not after penetration of the virus into the cell [11,13]. The monoterpene p-cymene exhibited the highest level of antiviral activity against HSV-1 in viral suspension tests. Antiviral activity was observed for p-cymene prior to host cell infection. This suggested that p-cymene inhibits HSV infection and might interfere with virion envelope structures or mask viral structures which are necessary for adsorption or entry into host cells [13]. Thymol also directly inhibits herpes virus infection and might interfere with virion envelope structures or mask viral structures which are necessary for adsorption or entry into host cells [29].

It can be viewed in nutshell that SAV will provide viral protection with benzyl alcohol virucidal activity in topical application; with Eugenol, Caryophyllene, Thymol, Anethole, Geranial, Neral/Citral, 1,8-Cineole, Cymene, Terpinene will prevent fusion of viruses with host cell (attachment with host); with Pinene and Limonene will result in interference in DNA replication by inhibition of DNA polymerase; and Cinnamaldehyde will inhibit protein synthesis by reducing proteolytic processing. Further, it is found that SAV oil blend compounds are effective against HSV. Therefore, it may be safely assessed that SAV oil blend may be effective to provide relief from viral diseases including COVID-19 with compounds like benzyl alcohol, 1,8-Cineole and Citral.

The additional properties of these anti-viral compounds that is anti-microbial, anti-bacterial and anti-inflammatory are likely to provide additional support to the patients, suffering from COVID-19 or any other viral infection, from other infections/pain (Table 2). This may help to maintain immunity and strength.

Whiff-MB (WMB): The polyherbal WMB is an oil blend prepared using the plant/herb-extracts/oils of the following: Nigella Sativa, Centaurea behen, Styrax benzoin, Citrus medica, Caryophyllus aromaticus, Curcuma longa, Elattaria cardamomum, Juniperus communis, Helianthus annuus, Sesamum indicum, Ricinus communis, Prunus amygdalus, Juglans regia, Cedrus deodara, Coriandrum sativum, Brassica campestris. WMB is for respiratory pulmonary system and provides support in easy respiration. The GC-MS analysis of WMB has shown the presence of 25 compounds wherein 22 compounds exhibit anti-inflammatory properties (Table 3). The relief in the respiratory distress is resolved because of these anti-inflammatory properties shown by the phyto-constituents in WMB.

The existing research studies support the anti-inflammatory characteristics of the identified compounds in GC-MS of WMB, which helps to associate the effective role of WMB in respiratory support system. Pinene represents anti-inflammatory property by significantly decreasing the LPS (lipopolysaccharide)-induced production of interleukin-6 (IL-6), tumor necrosis factor - (TNF-alpha), and nitric oxide (NO) [10]. Myrcene was considered the most potent in inhibiting NO production and also effective in preventing other inflammatory and catabolic responses in human chondrocytes, namely expression of iNOS, MMP-1 (matrix metalloproteinase-1) and MMP-13 induced by IL-1 β , likely reflecting, at least in part, the stronger inhibition of NF- κ B and

Table 3 Compounds with anti-inflammatory properties for pulmonary/respiratory relief identified in GC-MS of WMB polyherbal oil blend.

S. No.	Compounds	% Peak Area	Anti-inflammatory Property
1	Pinene	2.75%	✓ [10]
2	Terpinene	4.35%	✓ [12]
3	Cymene	2.66%	✓ [15]
4	Limonene	2.97%	✓ [16]
5	Terpinolene	0.38%	✓ [35]
6	Linalool	1.67%	✓ [36]
7	Menthone	4.42%	✓ [37]
8	Citral	2.88%	✓ [24]
9	Geraniol	1.3%	✓ [38]
10	Geranial	4.4%	✓ [26]
11	Eugenol	8.43%	✓ [31]
12	Copaene	0.52%	✓ [39]
13	Caryophyllene	2%	✓ [33]
14	Cinnamaldehyde	2.66%	---
15	Benzyl benzoate	0.88%	---
16	Myrcene	0.16%	✓ [40]
17	Phellandrene	0.20%	✓ [41]
18	1,8 Cineole	4.86%	✓ [19]
19	Estragole	0.98%	✓ [42]
20	Anethole	8.59%	✓ [27]
21	Thymol	2.71%	✓ [30]
22	Curcumene	0.29%	✓ [43]
23	Himachalene	1.92%	✓ [43]
24	Ocimene	0.36%	✓ [44]
25	Germacrene D	0.21%	---

the ability to inhibit all three mitogen-activated protein kinases (MAPKs); and also prevented the increase in collagen I induced by IL-1 β [40]. α -Phellandrene has been shown to attenuate the inflammatory response through neutrophil migration inhibition, mast cell degranulation and inhibition of nitric oxide (NO) production in macrophages and through anti-nociceptive effects [41]. Anti-inflammatory activity of ocimene is directly related to scavenging ability and/or capacity to inhibit iNOS expression, the enzyme responsible for the release of high amounts of NO, during inflammatory conditions [41-44].

Terpinene showed higher COX-2 (cyclooxygenase-2) activity inhibition, also effectively inhibited edema formation, and twice as potent as the reference drug diclofenac, a non-steroidal anti-inflammatory drug (NSAID) [12]. An anti-inflammatory response to different inflammatory agents like substance P, bradykinin, histamine, serotonin and TNF-alpha was shown by Estragole [42]. Cymene is associated with prostanoids in general and inhibits leukocyte migration [15].

Limonene have potential anti-inflammatory efficacy for the treatment of bronchial asthma by inhibiting cytokines, ROS (reactive oxygen species) production, and inactivating eosinophil migration [16]. Menthone results in decrease in the plasma levels of IL-4 and IL-10, thus indirectly negatively modulating blood eosinophils [37]. Linalool is a competitive NMDA (N-methyl-D-aspartate) receptor antagonist and the administration of excitatory amino acid receptor antagonists selectively attenuates carrageenan-induced behavioral hyperalgesia as found in rats [36]. 1,8 Cineole effectively decreased the levels of TNF- α , IL-1 β , and IL-6 but the levels of IL-10 were increased. By creating a balance between pro-inflammatory and anti-inflammatory cytokines 1,8-cineole shows anti-inflammatory effect [19]. The monoterpene Terpinolene (TPL) presented anti-hyperalgesia effect in Freund's complete adjuvant (CFA)-induced inflammatory pain in the acute and chronic phases. This effect seems to be mediated by the serotonin type-2A receptor (5-HT $_{2A}$), since pre-treatment with ketanserin (KET) reversed the TPL anti-nociceptive effect [35].

Citral (CIT) possess significant central and peripheral anti-nociceptive effects. It was also verified an anti-inflammatory activity, CIT acts as a suppressor of COX-2 and an activator of peroxisome proliferator-activated receptors (PPAR) α and γ . Moreover, CIT inhibits NO generation through suppression of iNOS expression via inhibition of NF- κ B activation [24]. Geraniol effect is also due to the inhibition of NO production through the suppression of NF- κ B activation [26]. With respect to the functioning of Geraniol, PGE $_2$ is synthesized from arachidonic acid by COX-2 and prostaglandin E synthase (PGES) in response to inflammatory stimuli. COX-2 serves as the main regulator inhibited LPS-induced COX-2 protein expression in a dose-dependent manner [38].

The effect of Anethole in pain models is considered due to a decrease in the production/ release of inflammatory mediators [27]. Thymol presents an irritative effect that likely involves histamine, prostanoids, and other inflammatory mediators [30].

Eugenol acts by causing inhibition of mediators of inflammation such as histamine, serotonin and prostaglandin [31]. In case of Copaene compound, the central analgesic action may be mediated via inhibition of central pain receptors, while peripheral analgesic effect may be mediated through inhibition of cyclo-oxygenase and/or lipo-oxygenase (and other inflammatory mediators) [39]. Caryophyllene causes suppression of pain and the anti-inflammatory activity exerted by β -caryophyllene (BCP) which is related to the activation of cannabinoid type-2 receptors (CB $_2$), characterizing BCP as an agonist of CB $_2$ [33]. The mechanism of anti-inflammatory activity by Curcumene is found to be multifactorial. It is found to be inhibiting lysosomal enzymes (acid phosphatase and cathepsin D) and was effective in inhibiting lipid peroxide formation [43]. Himachlene also identified with anti-inflammatory properties [43].

Study rationale

As of August 2020, India is at the third place globally with respect to number of confirmed COVID-19 cases which has crossed 2.9 million. Hence, there is a need of a study that can evaluate the effectiveness of indigenous alternative medicines in COVID-19, which had already been proven effective in viral infections. Sudarshan-AV and Whiff-MB are 100 percent natural oil extracts and to study the effectiveness of oils in treating COVID-19 is prudent because the ingredients in the oils have been reported to have anti-viral, antibacterial, anti-microbial, and anti-inflammatory properties as indicated above. Further, the oils can be used in all age groups.

Study objectives

The primary objective of the study is to identify the effect of Oil treatment (Sudarshan AV and Whiff MB) on fever and respiratory symptoms in patient's having COVID-19 like symptoms (COVID-19 status unknown) and COVID-19 positive patients.

Besides the primary objective, following are the secondary objectives of the study to identify an effective functioning of the Oil treatment:

1. To report the effect of Oil treatment on patients having co-morbid conditions
2. To report the effect of treatment on patients' miscellaneous symptoms
3. To report adverse events following Oil treatment, if any

Study design

A prospective study was carried during the current on-going COVID-19 pandemic on patients having COVID-19 like symptoms and COVID-19 positive patients. Patients were followed for 2 months after last dose of oil application. There were total of 1282 patients and among these, 44 patients were COVID-19 positive.

Study population

The following was the inclusion criteria for the sample patients. Patients included were who: had symptoms of cough and shortness of breath or difficulty breathing or at least two

symptoms among: fever, chills, repeated shaking with chills, muscle pain, headache, sore throat and loss of taste or smell and/or COVID-19 test positive; who are confirmed COVID-19 positive and under treatment; committed to medication dosing and assessment visits for evaluation. A patient was excluded from the study if: declined to continue medication or to take full dose for the given duration of Oil treatment; and physician did not allow to use Oil treatment.

Study treatments

Patients were divided into two treatment groups: One was Group 1, that is patients with confirmed COVID-19 cases; and second was Group 2, that is patients had COVID-19 like symptoms (where COVID-19 status was unknown). Currently, no treatment is available for COVID-19, so oil treatment was given along with any standard/specific treatment given by physicians to the patients in Group 1 (COVID-19 Positive patients). Thus, all the patients in hospital followed the standard care treatment, along with the Oil treatment. All the patients in Group 2 were treated with Oil treatment only. All treatment to Group 2 was also given under Physician's guidance. Most patients at home predominantly followed the oil protocol only. However, around 15% of patients at home also used warm water or Ayurvedic kadha or homeopathic medicine.

Dosage and administration

The amount of oils to be applied at one time was same for all patients; however, the frequency was varied depending on symptoms. For mild and moderate symptoms, topical oil administration was 4 times per day; and for severe symptoms, administration requirement was for 6 times a day. Directions for use for SAV were: topical administration of 3 drops on the back of the head-neck area, 3 drops under each foot and 7 drops on the whole spine. Similarly, WMB was used as 1 drop on the nostrils, 1 drop behind each ear, 2 drops on the temples (both sides of forehead), 4 drops on throat and 5 drops on the upper chest. All patients were followed at the period of 1 week up to 2 months after oil treatment in order to report adverse effects, if any.

Results

Among 1317 total patients, 35 patients were excluded from study due to incomplete information. Thus, 1282 patients were included in the analysis. The demographic and clinical characteristics of the participants, on the basis of gender, at the start of the oil treatment are detailed in **Table 4**.

Among the patients, both the male (65.97%) and female (72.79%) patients were predominantly between 40-59 years' age group. Nearly same percentage of patients had symptoms of cough among males (83.54%) and females (86.13%). The most common type of fever experienced in both groups was low grade fever. Similarly, the most common respiratory symptoms reported were congestion in the chest and difficulty in breathing / shortness of breath. With respect to drop in oxygen level, nearly same percentage was reported among male (38.01%) and female (37.08%) groups. The percentage of patients with miscellaneous symptoms was also similar in the both groups. The major

symptoms reported in males were fatigue 299 (42.41%), sore throat 168 (23.82%), headache 145 (20.56%), loss of taste 143 (20.28%) and loss of smell 129 (18.29%); and in females were also fatigue 203 (35.18%), sore throat 185 (32.06%), headache 86 (14.90%) and loss of taste 76 (13.17%).

Patient's breathing was resumed to normal within 12 hours of treatment in nearly 35% patients of Group 2 (COVID-19 status unknown). However, most of COVID-19 positive patients (56.86%) reported ease in breathing in 48 hours of Oil treatment (**Figure 1**).

Most of the patients in both groups COVID-19 positive (77.85%) and COVID-19 status unknown (54.54%) showed improvement in level of oxygen between 18 to 24 hour of oil treatment. It was noted that 100% of patients in COVID-19 status unknown showed

Table 4 Demographic and clinical characteristics of the participants at baseline.

Variables	Male (N=705)	Female (N=577)
Age - no. (%)		
<40 year	173 (24.53)	123 (21.31)
40–59 year	465 (65.97)	420 (72.79)
60–79 year	67 (9.50)	33 (5.71)
Fever - no. (%)		
Low grade (<100 °F)	403 (57.16)	305 (52.85)
Moderate grade (100-102 °F)	65 (9.21)	155 (26.86)
High grade (>102 °F)	231 (32.76)	82 (14.21)
Cough - no. (%)	589 (83.54)	497 (86.13)
Respiratory Symptoms - no. (%)		
Congestion in the chest	125 (17.73)	81 (14.03)
Difficulty in breathing / Shortness of breath	112 (15.88)	94 (16.29)
Heaviness in the chest	68 (9.64)	63 (10.91)
Tightness in the chest	32 (4.53)	35 (6.06)
Covid-19 Status		
Covid-19 Positive	24 (3.04)	20 (3.46)
Covid-19 status unknown	681 (96.59)	557 (96.53)
Miscellaneous signs and symptoms		
Anxiety	41 (5.81)	32 (5.54)
Body ache	123 (17.44)	176 (30.50)
Difficulty in swallowing	1 (0.14)	0
Fatigue	299 (42.41)	203 (35.18)
Gastric distress	9 (1.27)	14 (2.42)
Headache	145 (20.56)	86 (14.90)
Loss of appetite	52 (7.37)	35 (6.06)
Loss of taste	143 (20.28)	76 (13.17)
Nausea	8 (1.13)	3 (0.51)
Sore throat	168 (23.82)	185 (32.06)
Weight loss	3 (0.42)	3 (0.51)
Confusion	1 (0.14)	2 (0.34)
Loss of smell	129 (18.29)	61 (10.57)
Raised blood pressure	1 (0.14)	0
Vomiting	2 (0.28)	1 (0.17)
Drop in oxygen level	268 (38.01)	214 (37.08)

improvement in level of oxygen before 48 hours. However, the patients in COVID-19 positive group took greater than 48 hours for same effect (Figure 2).

Most of the COVID-19 status unknown patients (61.23%) experienced easing in cough symptoms before 12 hours. In contrast, 72.09% of COVID-19 Positive experienced ease in coughing symptoms in 24 hours (Figure 3).

Patients' temperature was predominantly lowered on 12 (n = 246) and 24 hours (n = 307) of treatment among the patients presenting low grade fever. However, majority of the patient's (moderate and high grade) temperature was lowered in 48 and 72 hours of Oil treatment. All patients with low grade and moderate grade fever recovered within 72 hours of oil treatment. Only one patient from high grade fever took 96 hours to recover (Figure 4).

Out of 1282 patients, nearly 48% of the patient had single co-morbid condition, whereas about 32% had more than one co-morbid conditions. The co-morbid conditions for 20% were unknown. The noted co-morbid conditions included Diabetes mellitus, Hypertension, Osteoarthritis and Hyperthyroidism (Figure 5). Patients didn't report any kind of aggravation in the stated co-morbid conditions.

Most of the patient had general disorders (body ache and fatigue), followed by nervous disorders (headache, loss of taste and loss of smell) and respiratory disorders (difficulty in swallowing, gastric distress, nausea and vomiting). A larger portion of patients' miscellaneous symptoms recovered within 1 to 3 days of treatment (Figure 6).

Adverse events following oil treatment

All the patients had well taken the Oil treatment with nil allergies or skin irritation due to oil usage. No adverse events were reported by any patient till the report compilation (greater than 2 months).

Discussion

As of now, no treatment is available to treat, cure or prevent COVID-19. Thus, it is essential to study the effectiveness of herbal remedies which has already been proven in viral infections. In this study, the two polyherbal oil formulations, that is Sudarshan (AV) and Whiff (MB) are used for possible treatment investigations in COVID-19 positive patients (along with standard treatment) and patients having COVID-19 like symptoms (COVID-19 status was unknown). The standard treatment was not violated and the oil

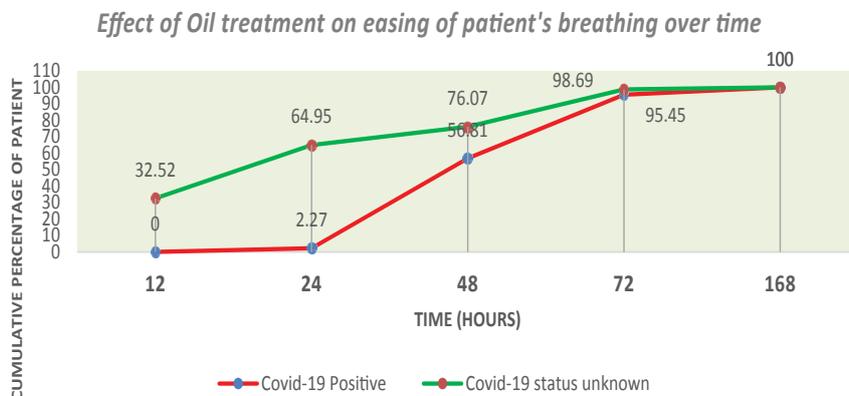


Figure 1 Effect of oil treatment on easing patient's breathing over time.

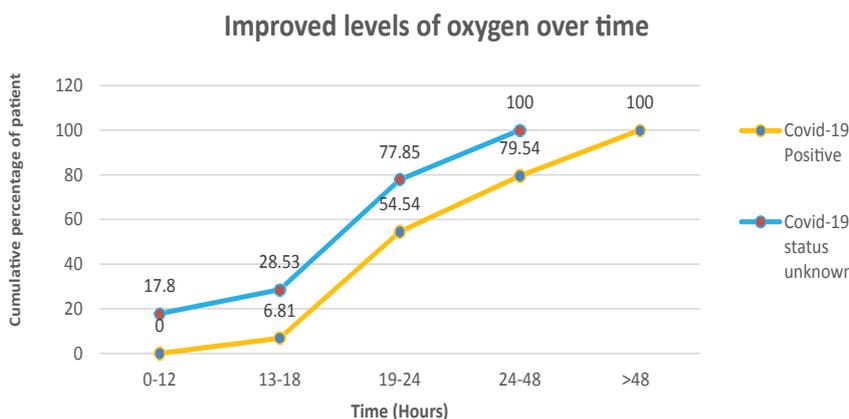


Figure 2 Improvement of oxygen levels in patients over time.

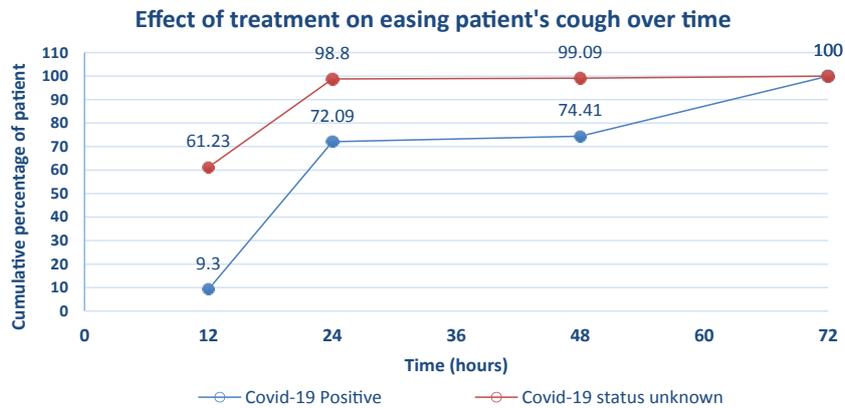


Figure 3 Effect of treatment on easing patient's cough over time.

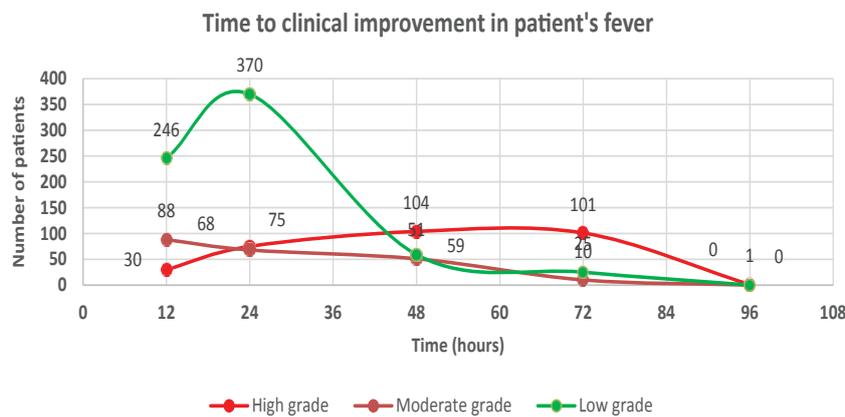


Figure 4 Time to clinical improvement in patient's fever with oil treatment.

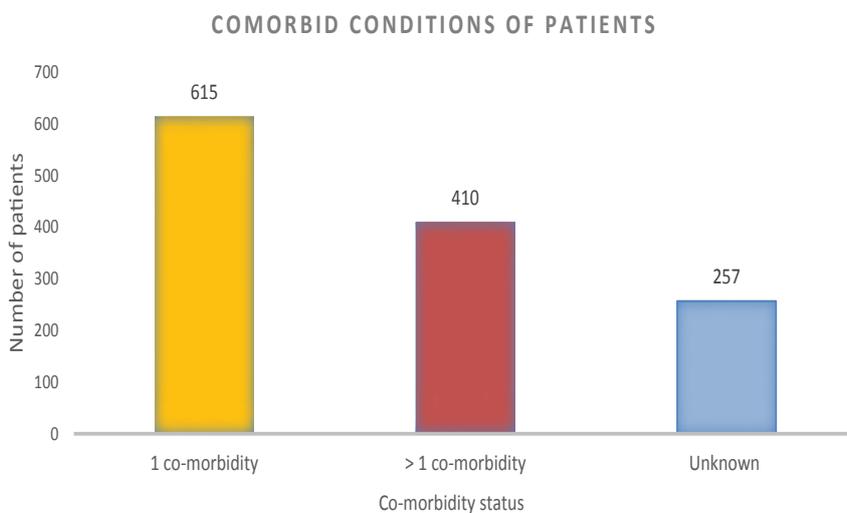


Figure 5 Co-morbid conditions of patients.

treatment was given along with patient specific treatment under Physicians' guidance for COVID-19 positive patients. However, patients with COVID-19 like symptoms (COVID-19 status was

unknown) were treated with Oil treatment. It was found that nearly 95% of patients in both the groups, experienced ease in breathing symptoms within 72 hours of treatment. Similarly,

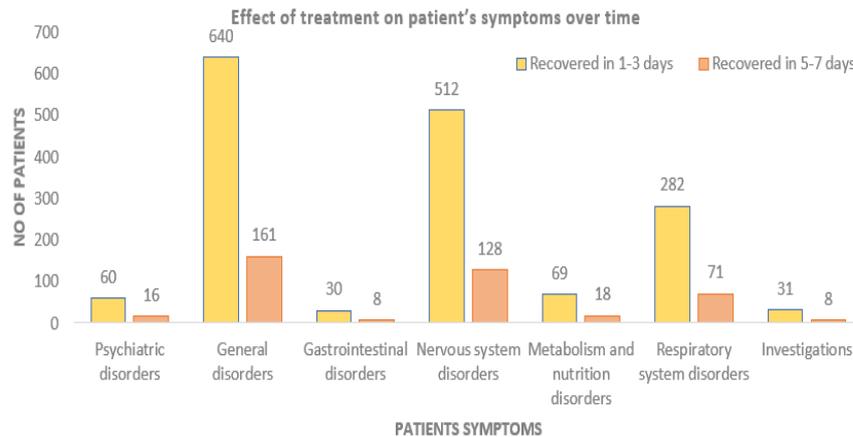


Figure 6 Effect of treatment on patients' symptoms over time.

COVID-19 positive (72.09%) and COVID-19 status unknown group (98.80%) patients felt comfort from cough within 48 hours of Oil administration. Despite, of having nearly 80% of patient with co-morbidity, no patient experienced aggravation of their pre-existing conditions even after two months of treatment exposure. So, it can be concluded that the drug is safe to be prescribed in patient even with co-morbid conditions like Hypertension, Diabetes mellitus, Osteoarthritis and Hyperthyroidism. Further, all patient with low grade and moderate grade fever recovered within 72 hours of Oil treatment. Only one patient having high grade fever, took 96 hours to recover. So, the effect of oil treatment in reducing the fever was also promising. Most of the patients predominantly recovered within 1 to 3 days of treatment irrespective of type of disorder. A lesser number of patients took time but still recovered within 5 to 7 days of treatment. Hence, the oil treatment was found effective in curing the patients' symptoms within a period of 1 to 7 days with no side effects reported over 2 months after application of oils.

Conclusion

As per the treatment protocol, patients with unknown COVID-19 status, were treated with Oil only. Hence, it can be said that the Oil treatment was found effective in relieving patients from COVID-19 symptoms within short period of time without showing any adverse events. Likewise, the oils were also found to be

effective in easing symptoms in COVID-19 positive patients. Based on the above evidences, it can be strongly assessed and believed that the oils can play a promising effect in COVID-19 treatment. However, a larger study is required to confirm its effect.

One may consider that there could be a possibility of the spontaneous remission. However, the GSMS analysis and the study results throw up interesting insights into the efficacy of plant extracts based oil blends as bio-medicine in treatment of COVID 19. Further, the oil blends work on the dual mechanism based on their synergistic effect and on the mechanism of fighting viral infections to neutralize the viral strains. There is again a possibility of more working mechanisms which can be investigated further through detailed analysis. In the present study, large majority of respondents were recovered in 1-3 days and some in 6-7 days indicating an encouraging result for the use of bio-medicine in such infections/pandemic. As per Sarangdhar Samhita, a formulation of multiple plant extracts presents a synergism to have enhanced therapeutic effect. Such insights of faster cure as observed in the present study, with polyherbalism synergy can be further examined through broader and deeper studies and may open new vistas in treating viral and may be other infections that have few or no treatment options like COVID 19.

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