Journal of Ayurveda and Integrative Medicine 13 (2022) 100553

Contents lists available at ScienceDirect

Journal of Ayurveda and Integrative Medicine

journal homepage: http://elsevier.com/locate/jaim

Case Report

Effect of Siddha medicine *Poorna chandirodayam* and *Gorojanai mathirai* among Covid 19 patients suffering from hypoxia – A case series

J. Jeyavenkatesh [a, *], P. Saravanapandian [a], M. Amali JancyMargaret [a], R. Shanmuga Priya [b]

[a] *Kokila Siddha Hospital and Research Centre, Kunnanampatti Village, Thirumangalam, Madurai 625706, India*
[b] *Shivalaya Siddha Cikitchalaya, Melur, Madurai, India*

ARTICLE INFO

Article history:
Received 8 October 2021
Received in revised form
23 December 2021
Accepted 25 January 2022
Available online 2 February 2022

Keywords:
Siddha medicine
Covid 19
Hypoxia
Poorna chandirodaya chendooram
Gorojanai mathirai

ABSTRACT

Gold, sulfur and mercurial formulations in Indian alchemy are consumed in conjunction with suitable adjuvant for their synergistic action, reduced toxicity and boosting their bioavailability resulting in improved effectiveness. *Poorna chandrodaya chendooram* is a well-known mercurial mixture containing gold and sulfur that has traditionally been used to treat a variety of diseases. Fel bovinum purifactum (*Gorochanai*) is an expectorant. It also acts as a bronchodilator. The second wave mutant virus has better transmission potential and a shorter incubation period than the first wave. Some diabetic patients treated for SARS-CoV-2 with high dose corticosteroids had a decrease in angioinvasive maxillofacial fungal infections (Mucormycosis).

Without using synthetic steroids and with optimum oxygen support, this case report emphasizes the therapeutic success of administering *Poorna chandirodayam* and *Gorojanai mathirai* together with herbal and herbomineral Siddha formulations in the early inflammatory phase of COVID-19 infection. Five patients with the laboratory-confirmed diagnosis of coronavirus (SARS-CoV-2) infection admitted in the approved Siddha Covid hospital have been involved in the study.

Metal-based medications *P. chandirodayam* and *G. mathirai* have been demonstrated through these case series to be safe and useful in COVID19.

1. Introduction

Poorna chandirodaya chendooram is a well-known mercurial mixture containing gold and sulfur [1] that has traditionally been used to treat a variety of diseases including tuberculosis, jaundice, fever, rat-bite, malignant ulcer, sprue, and male sterility [2]. To aid with titration, hibiscus and aloe juice are added [3]. These pharmaceuticals are mostly composed of a variety of substances, and as a result of their synergistic effect and purifying process, their toxicity is reduced and consequently the bioavailability is enhanced [4]. These medications are efficacious at extremely low concentrations [5]. Although phytochemical analysis of *P. chandirodaya chendooram* revealed the presence of flavonoids, phenols, and Vitamin C, a full picture of its toxicokinetics remains unknown [6,7].

Fel bovinum purifactum (*Gorochanai*) is an expectorant. It is used to treat fever, nausea, dyspnea, general weakness, headache, and other symptoms in children. *Gorochanai* pill relieves asthma, hiccups, cough, and hemiplegia. It acts as a bronchodilator. The pill balances *vatha* and *kapha*, as well as enhancing *pitha* [8].

Some diabetic patients [9] treated for COVID-19 with high dose corticosteroids had a decrease in angioinvasive maxillofacial fungal infections (Mucormycosis). COVID-19 severe sickness normally occurs 1 week after commencement of symptoms. Dyspnea is the most prevalent symptom, often accompanied by hypoxia. Patients with the severe illness often require supplemental oxygen and should be constantly watched for respiratory distress since some may develop 'Acute Respiratory Distress Syndrome (ARDS)'. WHO recommends rapid supplementary oxygen therapy for individuals with respiratory distress, hypoxia or shock.

* Corresponding author.
E-mail: jeyavenkateshdrs@gmail.com (J. Jeyavenkatesh)
Peer review under responsibility of Transdisciplinary University, Bangalore.

https://doi.org/10.1016/j.jaim.2022.100553

Five adults with SARS-CoV-2 infection were hospitalized to the Covid Care Centre at Kokila Siddha Hospital & Research Centre in Thirumanagalam, Madurai. The drugs administered are *Poorna chandirodayam* and *Gorojanai mathirai* together with herbal and herbomineral Siddha formulations. They showed effective for their synergistic action on lungs by enhancing broncho dilatation and specific anti-microbial properties. Without using synthetic steroids and with optimum oxygen support, this case report emphasizes the therapeutic success in the early inflammatory phase of COVID-19 infection and hypoxic situation.

2. Participants

Five patients with the laboratory-confirmed diagnosis of coronavirus (SARS-CoV2) infection admitted in the Kokila Siddha Hospital and Research Centre, (Approved Siddha Covid Care Hospital), Madurai have been involved in the study. Data were collected from May and Jul 2021.

3. Drug profile

The following table consists of the details of drugs used to treat Covid 19 patients such as type, name, dosage, formula, ingredients and manufacturer (Table 1).

4. Case description

4.1. Case I

A 63-years-old female was admitted with complaints of cough, headache, fever, dyspnea, malaise & difficulty in breathing. The patient had a history of Diabetes Mellitus for 3 years and dyslipidemia for 4 years and was on allopathic medication. The patient was clinically diagnosed as Covid 19 positive by RT-PCR test and CT scan revealed the score of 9/25(Grade 5). At the time of admission, the patient had a respiratory rate-38/min, Spo2-82%. The hematological and biochemical investigations provided the following results, D-Dimer-390, CRP-11, Ferritin – 302, PTT-18. After the

Table 1
Drug description used during the course of the treatment.

Drug name	Dose/formula	Ingredients	Manufacturer
Chenduram Poorna chandirodayam	50 mg/*Therayar karisal* 300	Purified gold Purified mercury Purified sulfur *Gossypium arboreum* flower juice *Musa paradisiaca* stem juice	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041
Tablet *Gorojanai mathirai*	100 mg/*Agasthiyar Ratna churukkam*	Bezoar of cow *Crocus sativus* stamens *Cinnamomum camphora* *Myristica fragrans* nut *Syzygium aromaticum* flower buds *Elettaria cardamomum* fruits *Saussurea costus* *Anacyclus pyrethrum* Purified mercury chloride Purified mercury sulphide Mica *parpam* *Santalum album* wood decoction *Michelia champaca* flower decoction *Crocus sativus* flower decoction	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041
Tablet *Vasantha kusumakaram*	100 mg/*Siddha vaidya thirattu*	Purified mercuric sulphide Purified borax Purified sulfur *Piper longum* *Saussurea costus* *Anacyclus pyrethrum* *Glycyrrhiza glabra* *Acacia Arabica* gum *Cinnamomum camphora* *Crocus sativus* Ginger juice	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041
Tablet *Brahmananda bairavam*	100 mg/*Siddha vaidya thirattu*	Purified sulfur Purified red orpiment Purified yellow orpiment *Aconitum ferox* Rt. *Zingiber offcinale* Rz Purified cinnabar Purified borax	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041
Karuppu Kasthuri karuppu	50 mg/*Siddha vaidya thirattu*	*Moschus moschiferous* *Cinnamomum camphora* *Bos indicus* *Crocus sativus* Purified Mercury Purified Suphur Purified Natural Mercuric Sulphide Purified Mercurous Chloride Purified Artificial Mercuric Sulfide Purified Arsenic trisulphide Purified Arsenic disulphide	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041

Table 1 (*continued*)

Drug name	Dose/formula	Ingredients	Manufacturer
		Piper longum *Trachyspermum ammi*	
Manappagu Adathodai manappagu	10 ml/*Siddha vaidya thirattu*	*Adathoda vasika* *Saccharum officinarum*	Raja Sidhaa Marundagam 3/1A, Tharumathupatti, Kappalur, Madurai-625008
Parpam Naaga parpam	100 mg/*Siddha vaidya thirattu*	Purified zinc *Wedelia calendulacea* leaf juice *Aloe vera* pulp	Raja Sidhaa Marundagam 3/1A, Tharumathupatti, Kappalur, Madurai-625008
Churnam Thaleesadi churnam	1 g/*Agasthiyar ratnachurukkum*	*Taxus baccata* *Cinammomum verum* *Elettaria cardamomum* *Zingiber officinale* *Glycryrrizha glabra* *Ferula foetida* *Emblica officinalis* *Saussurea lappa* *Piper longum* Rt *Cuminum cyminum* *Nigella sativa* *Anethum sowa* *Piper longum* Fr *Syzygium aromaticum* *Myristica fragrans* Kr *Myristica fragrans* Ar *Pistacia integrimma* *Terminalia chebula* *Terminalia bellerica* *Nardostachys jatamansi* *Piper nigrum* *Cinnamomum wightii* *Michelia champaca* *Embelia ribes* *Cinnamomum tamala* *Trachyspermum ammi* *Corriandrum sativum* *Saccharum officinarum*	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041
Tablet *Swasa Kudori*	100 mg/*Siddha vaidya thirattu*	*Calotropis gigantea* flowers *Piper nigrum* fruits	The Indian Medicine Practitioners Co-operative Pharmacy & Stores Ltd., Thiruvanmiyur, Chennai-600041
Manappagu Maduali manappagu	10 ml/*Siddha vaidya thirattu*	*Punica granatum* *Rose damascene* Honey *Saccharum officinarum*	Raja Sidhaa Marundagam 3/1A, Tharumathupatti, Kappalur, Madurai-625008
Churnam Thayirchundi churnam	2 g/*Siddha vaidya thirattu*	Sodium chloride impura Glass salt Alkaline Earth salt Sodium chloride Sochal salt Dried *Zingiber officinale* Cow's curd sour	Raja Sidhaa Marundagam 3/1A, Tharumathupatti, Kappalur, Madurai-625008
Kudineer Nialvembu Kudineer	60 ml/*Siddha vaidya thirattu*	*Andrographis Paniculata* *Vetiveria Zizanioides* *Plectranthus Vettiveroides* *Cyperus rotundus* *Santalum album* *Zingiber officinale* *Piper nigrum* *Trichosanthes cucumerina* *Mollugo cerviana*	Raja Sidhaa Marundagam 3/1A, Tharumathupatti, Kappalur, Madurai-625008

administration of the intervention on eleventh day, it has been reduced as follows D-Dimer-280, CRP-5.24, Ferritin-92.6, PTT-13. CT Chest was not done before discharge as the patient was unwilling to give consent for it (Table 2).

4.2. Case II

A 68-years-old female was admitted with complaints of dyspnea, cough, for 16 days. The patient had a history of diabetes mellitus for 1 year and she was taking Tab. Metformin 500 mg twice daily for diabetes. The patient had lower limb numbness for 7 days. The patient was clinically diagnosed as Covid 19 positive by RT-PCR test (CT Value-27) and the CT scan revealed the score of 12/25 (40–80% lung involvement). At the time of admission, the patient had a respiratory rate-20/min, Spo2-92%. The hematological and biochemical investigations showed the following results, D-Dimer-148.7, CRP-30.21, Ferritin – 311.4, PTT-19. After the administration of the intervention on fifth day, it has been reduced as follows D-Dimer-90.6, CRP-16.2, Ferritin-288.1, PTT-17. After 7 days CRP has been reduced to 8.54. Patient did not give consent for performing CT Chest at the time of discharge (Table 3).

Table 2
Clinical characteristics and line of treatment of case 1.

Day	Symptom & evaluation	Treatment
Day 1	Dyspnea, fever present SpO_2-82% T-102.2 F PR-122/min PP-380 mg/dl	Oxygen support given (4 l) Kudineer Nilavembu kudineer 60 ml thrice daily Chenduram Poorna chandirodayam 50 mg twice daily with honey for 7 days Tablet Vasantha kusumakaram 100 mg twice daily with honey for 7 days Tablet Brahmananda bairavam 100 mg twice daily with honey for 7 days Karuppu Kasthuri karuppu 50 mg twice daily with honey for 5 days Manappagu Adathodai manappagu 10 ml twice daily with honey for 7 days Parpam Naaga parpam 100 mg twice daily with honey for 7 days
Day 2	Dyspnea persists, fever persists, headache present. SpO_2-92% T-99 F PR-98/min PP-348 mg/dl	Continued the same treatment with oxygen support (4 l). Tablet *Gorojanai mathirai* 100 mg twice daily with honey is further added for 5 days
Day 6	Oral ulcer present. Vomiting present. SpO_2-89% without O_2 support,92% with O_2 support T-98 F PR-111/min FBS-118 mg/dl	Continued the same treatment with oxygen support (4 l).
Day 8	Nausea present. SpO_2-90% without O_2 support,92% with O_2 support T-98 F PR-100/min FBS-128 mg/dl	Continued the same treatment with oxygen support (4 l). Kudineer Nilavembu kudineer 60 ml once daily Maduali manappagu 10 ml twice daily for 5 days was added.
Day 12	Breathing difficulty reduced, Patient feels better. SpO_2-93% T-98 F BP-140/90 mm Hg PR-95/min	Intermittent oxygen support (2 l) was maintained 2 days prior to discharge. The patient was discharged with normal vitals and stable condition.

l means liters per minute.

Table 3
Clinical characteristics and line of treatment of case 2.

Day	Symptom & evaluation	Treatment
Day 1	Fever, Dyspnea, Palpitation present. SpO_2-93% T-98 F BP-140/90 mm Hg PR-95/min BS-F-104 mg%	Oxygen support (4 l) given. Chenduram Poorna chandirodayam 50 mg twice daily with honey for 7 days Tablet *Gorojanai mathirai* 100 mg twice daily with honey is further added for 5 days Tablet Brahmananda bairavam 100 mg twice daily with honey for 7 days Tablet Vasantha kusumakaram 100 mg twice daily with honey for 7 days Tablet Swasa kudori mathirai 100 mg 2 tablets twice daily with lukewarm water for 7 days Manappagu Adathodai manappagu 10 ml twice daily with honey for 7 days Thaleesadi churnam 1 g twice daily with honey for 7 days
Day 2	Fever, Headache, Dyspnea, Joint pain, Fatigue, tongue bitterness present. SpO_2-92% T-98.7 F BP-120/70 mm Hg PR-82/min	Continued the same treatment with oxygen support (5 l).
Day 6	Dyspnea reduced. The patient feels better. SpO_2-94% T-98 F BP-112/82 mm Hg PR-86/min BS-F-110 mg%	Intermittent oxygen support (2 l–5 l) was maintained. Continued the same treatment.
Day 7	The patient feels better. Symptoms reduced. SpO_2-97% T-98.4 F BP-120/80 mm Hg PR-86/min	The patient was discharged with normal vitals and stable condition.

l means liters per minute.

4.3. Case III

A 52-years-old male was admitted with complaints of fever, cold, cough, mild anosmia, diarrhea, vomiting, dyspnea, malaise for 1 week. The patient had a history of Diabetes mellitus for 15 days. The patient was clinically diagnosed as Covid 19 positive by RT-PCR test (CT Value-16) and the CT scan revealed a score of 14/25 (Grade 5). At the time of admission, the patient had a respiratory rate-24/min, Spo2-96%. He was tested for blood sugar (Fasting) on Day 1, 2,5,8,10,13 and no medication was prescribed due to satisfactory

control. The hematological and biochemical investigations were done which showed the following results, D-Dimer-498, CRP-107.4, Ferritin − 290.4, LDH-529.2. After the administration of the intervention on twelfth day, it has been reduced as follows D-Dimer-310, CRP-50.14, Ferritin-203.4, LDH -392.1. Patient did not provide consent for CT Chest at the time of discharge (Table 4).

4.4. Case IV

A 48-years-old female patient was admitted with complaints of cough, dyspnea. The patient had a history of Diabetes Mellitus for 10 years and was on medication. The patient was clinically diagnosed as Covid 19 positive by RT-PCR test (CT Value-16) and the CT scan revealed the score of 15/25 (60% lung involvement). At the time of admission, the patient had a respiratory rate-32/min, Spo2-82%, Temperature-94F. The hematological and biochemical investigations provided the following results, D-Dimer-2114, CRP-107.2, Ferritin− 658.2, LDH-793.9, PTT-22. After the administration of the intervention on fifteenth day, it has been reduced as follows D-Dimer-433, CRP-7.72, Ferritin-197.6, LDH − 276.2, PTT-14. Patient's consent for CT Chest before discharge could not be obtained (Table 5).

Table 4
Clinical characteristics and line of treatment of case 3.

Day	Symptom & evaluation	Treatment
Day 1	Dyspnea present. SpO_2-90% T-98.6 F BP-140/70 mm Hg PR-96/min BS-F-110 mg%	Oxygen support (8 l) was given. Chenduram Poorna chandirodayam 50 mg twice daily with honey for 7 days Tablet *Gorojanai mathirai* 100 mg twice daily with honey is further added for 5 days Tablet Vasantha kusumakaram 100 mg twice daily with honey for 7 days Tablet Swasa kudori mathirai 100 mg 2 tablets twice daily with lukewarm water for 7 days Manappagu Adathodai manappagu 10 ml twice daily with honey for 7 days
Day 5	Symptoms reduced. SpO_2-96% T-98.4 F BP-120/80 mm Hg PR-102/min BS-F-99 mg%	Continued the same treatment with oxygen support (5 l).
Day 9	Symptoms reduced. Insomnia present. Saturation drops to 88% while sitting with 5 l oxygen. BS-F-100 mg%	Continued the same treatment with oxygen support (5 l). Karuppu Kasthuri karuppu 50 mg twice daily with honey for 5 days Parpam Naaga parpam 100 mg twice daily with honey for 5days Churnam Thaleesadi churnam 1 g twice daily with honey for 3 days
Day 13	Symptoms reduced. Dyspnea is present while sitting. SpO_2 − 96% BS-F-88 mg%	Continued the same treatment with intermittent oxygen support (3 l).
Day 15	Symptoms reduced. The patient feels better. SpO_2-94% T-98 F BP-102/74 mm Hg PR-121/min	The patient was discharged with normal vitals and stable condition.

l means liters per minute.

Table 5
Clinical characteristics and line of treatment of case 4.

Day	Symptom & evaluation	Treatment
Day 1	Dyspnea present. SpO_2-82% T-98.4 F BP-120/80 mm Hg PR-102/min	Oxygen support (4 l) was given. Chenduram Poorna chandirodayam 50 mg twice daily with honey for 7 days Tablet *Gorojanai mathirai* 100 mg twice daily with honey is further added for 5 days Tablet Brahmananda bairavam 100 mg twice daily with honey for 7 days Tablet Vasantha kusumakaram 100 mg twice daily with honey for 7 days Tablet Swasa kudori mathirai 100 mg 2 tablets twice daily with lukewarm water for 7 days Manappagu Adathodai manappagu 10 ml twice daily with honey for 7 days Thaleesadi churnam 1 g twice daily with honey for 7 days
Day 3	Diarrhea, Vomiting present. SpO_2-95% T-99.8 F BP-110/70 mm Hg PR-88/min	Continued the same treatment with oxygen support (4 l). Karuppu Kasthuri karuppu 50 mg twice daily with honey for 5 days Parpam Naaga parpam 100 mg twice daily with honey for 5days Thayir chundi churanam 2 g with buttermilk 4 times in a day
Day 5	Diarrhea, Vomiting stopped. SpO_2-95% T-99.7 F BP-125/72 mm Hg PR-78/min	Continued the same treatment with oxygen support. Thayir chundi churanam was stopped
Day 9	Symptoms slightly reduced. Vomiting present. SpO_2-96%	Continued the same treatment with oxygen support.
Day 12	Symptoms reduced. The patient feels difficulty in speaking, belching present, epigastric pain present.	Continued the same treatment with oxygen support. Added Madhulai manapagu 10 ml twice daily for 5 days
Day 17	Symptoms reduced. The patient feels better. SpO_2-95% without oxygen T-98.3 F BP-119/77 mm Hg PR-97/min	Intermittent oxygen support was practiced prior to discharge. The patient was discharged with normal vitals and stable condition.

l means liters per minute.

4.5. Case V

A 57-years-old male patient was admitted with complaints of cough, dyspnea. The patient had a history of COPD for 4 years and was on medication. The patient was clinically diagnosed as Covid 19 positive by RT-PCR test and the CT scan revealed the score of 17/25. At the time of admission, the patient had a respiratory rate-45/min, Spo2-87%, Temperature-98.4F. The hematological and biochemical investigations provided the following results, D-Dimer-678.7, CRP-99.24, Ferritin− 412, LDH-680, PTT-22. After the administration of the intervention on fifth day, it has been reduced as follows D-Dimer-600, CRP-29.34, Ferritin-189.3, LDH − 631.4, PTT-17. Patient's copnsent for CT Chest before discharge could not be obtained (Table 6).

4.6. Discharge

At the time of discharge patients were advised for home quarantine for the next 7 days (see Table 1). The discharge medicine kit containing the following medicines (Table 7) were given to the patients for 7 days. A telephonic follow up was made after 7th day and 15th day to make sure that patient feels better.

5. Results

The most notable outcome of this study is a reduction in clinical symptoms and an increase in oxygen saturation. Because this was an observational trial, the medications were administered to the patients and the results were monitored. Among the five cases investigated, there were two males and three females. The average age was 57 years. As a comorbid illness, 1 patient had asthma, 1 patient had COPD, 3 patients had Diabetes Mellitus, and 1 patient had hypertension. Without the use of synthetic steroids and the minimum needed measured dose of oxygen support, *P. chandirodayam* and *Gorochanai* tablets, along with other herbal and herbomineral combinations, are safe and effective in the early inflammatory phase of SARS-CoV-2 infection and in moderate to severe instances with hypoxia. Patients did not experience any negative effects throughout period of treatment, leading to the conclusion that *P. chandirodayam* and *G. mathirai* are effective bronchodilators. It's also safe and helpful in SARS-CoV-2 infection for patients with severe hypoxia. All the patients in the study reported that their quality of life was satisfactory. Telephonic follow-up was made for 45 days after the discharge to confirm that there is no evidence of Mucormycosis.

6. Evaluation of covid markers (Fig. 1)

The following charts represent the laboratory investigation such as D Dimer, LDH, Ferritin, CRP and PTT levels before and after the intervention for each of these five patients. Despite the fact that these levels have not yet reached the normal range, positive alterations have been observed, leading to a favorable prognosis with concomitant improvement in the symptoms profile with symptoms.

7. Screening of liver and renal functions

All the patients admitted in the hospital underwent biochemistry screening of liver and renal functions. The RFT and LFT were done on first day of treatment and the day before discharge. The results indicated that the drugs are safe and does not cause liver and renal impairment if taken in the prescribed dose (Tables 8 and 9).

Table 6
Clinical characteristics and line of treatment of case 5.

Day	Symptom & evaluation	Treatment
Day 1	Dyspnea present SpO_2-87% without oxygen support 93% with 4 l oxygen T-99 F BP-165/90 mm Hg PR-111/min	Oxygen support (4 l) was given. Tablet Brahmananda bairavam 100 mg twice daily with honey for 7 days Tablet Vasantha kusumakaram 100 mg twice daily with honey for 7 days Tablet Swasa kudori mathirai 100 mg 2 tablets twice daily with lukewarm water for 7 days Adathodai manappagu 10 ml twice daily with honey for 7 days
Day 4	Symptoms slightly reduced. SpO_2-94% with 4 l oxygen support	Continued the same treatment with oxygen support (4 l). Added Chenduram Poorna chandirodayam 50 mg twice daily with honey for 7 days Tablet *Gorojanai mathirai* 100 mg twice daily with honey is further added for 5 days
Day 6	Symptoms reduced. 6 min walk test: Before walk: SpO_2-95% After walk: SpO_2-91%	Continued the same treatment without oxygen support.
Day 7	Symptoms reduced. The patient feels better. SpO_2-96% without oxygen T-98.4 F BP-146/101 mm Hg PR-97/min	The patient was discharged with normal vitals and stable condition.

l means liters per minute.

Table 7
Description of drugs prescribed after discharge.

Drug name	Dose	Time/adjuvant	Days
Thaleesadi churnam	1 g	Morning and night, mixed with honey or Luke warm water	7−14 days
Maduali manappagu	10 ml	Morning and Night with Luke warm water	7 days
Nialvembu Kudineer	60 ml	Evening only	7 days

Table 8
Renal function test before & after treatment.

Test	Case 1		Case 2		Case 3		Case 4		Case 5	
	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
Serum urea	28.9	28	41	32	37	35	33	30	36	32
Serum creatinine	1.2	1.2	1.08	0.98	1.1	0.9	0.99	0.90	0.99	0.79

BT: before treatment, AT: after treatment, reference range − serum urea: 20−40 mg/dl, serum creatinine: 0.5−1.2 mg/dl.

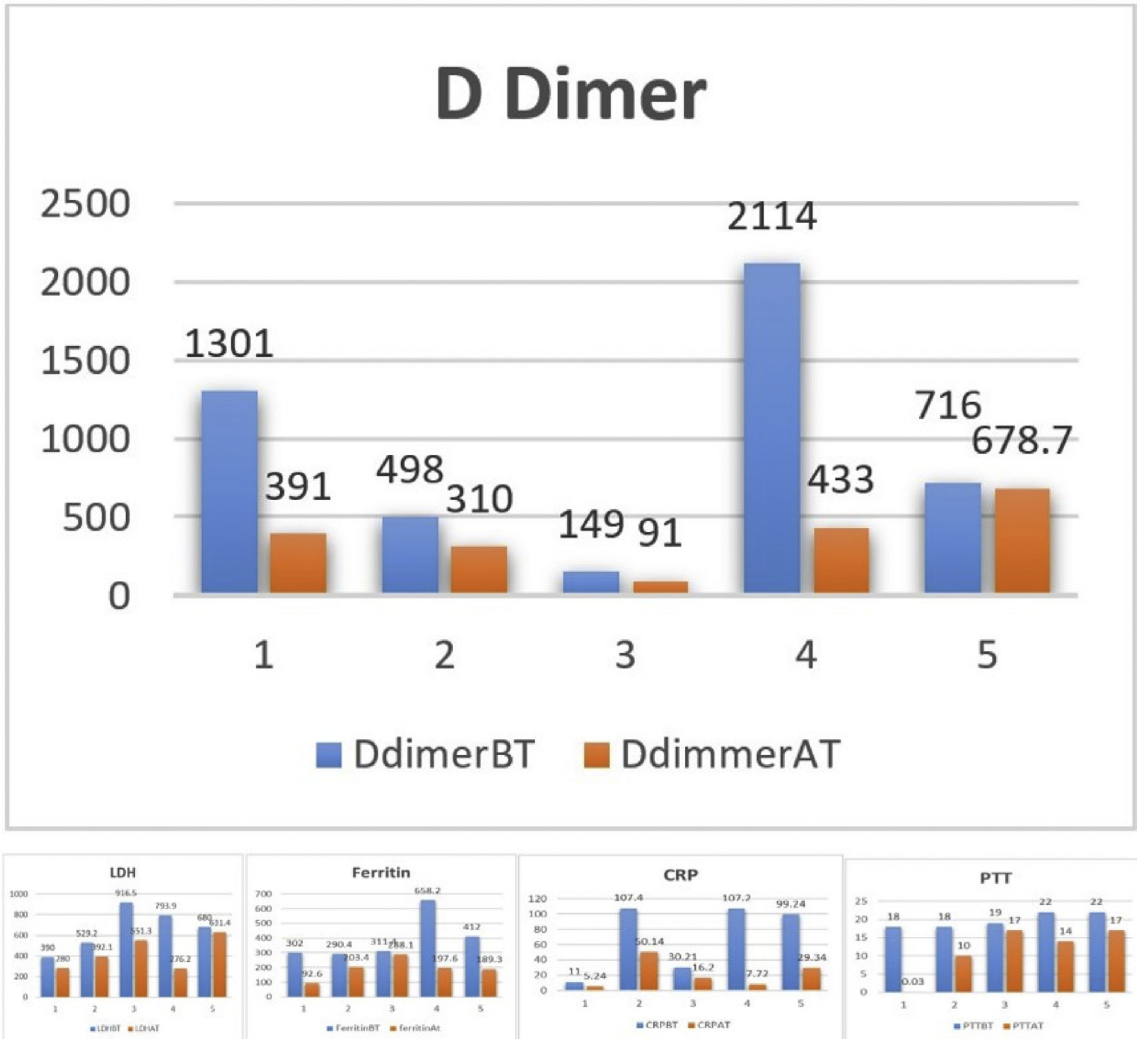

Fig. 1. Effect of D Dimer, LDH, Ferritin, CRP and PTT level before and after the intervention.

Table 9
Liver function test before & after treatment.

Test	Case 1		Case 2		Case 3		Case 4		Case 5	
	BT	AT	BT	AT	BT	AT	BT	AT	BT	AT
Total bilirubin	0.79	0.88	0.58	0.57	0.59	0.69	0.79	0.79	0.79	0.79
Direct bilirubin	0.37	0.23	0.22	0.22	0.11	0.36	0.37	0.37	0.37	0.37
Indirect bilirubin	0.42	0.65	0.36	0.35	0.48	0.43	0.42	0.42	0.42	42
SGOT	42	30	35	35	30	31	42	41	42	42
SGPT	39	27	32	32	27	27	39	39	36	34
Total protein	5.3	6.7	7.1	7.7	6.4	6.4	8.3	8.3	6.3	7.3
Albumin	2.4	3.6	3.9	3.9	3.6	3.9	3.2	3.4	3.2	5.1
Globulin	2.9	3.1	3.2	3.4	2.8	2.9	5.1	4.1	3.9	3.5

BT: before treatment, AT: after treatment, reference range – total bilirubin: 0.3–1.0 mg/dl, direct bilirubin: 0.1–0.3 mg/dl, SGOT: upto 40 u/l, SGPT: upto 40 u/l, total protein: 6.0–8.5 g/dl, albumin: 3.5–5.0 g/dl, globulin: 2.5–3.5 g/dl.

8. Discussion

8.1. Limitations

- Because this is a case series with a small sample size, corroboration from studies with larger sample size is required before we can design a treatment protocol for COVID-19 infection.
- The physical distance between the patient and the doctor made direct examination and observation of the patient difficult.
- Dealing with the patient's mental health was more difficult than dealing with the infection itself.
- The patient's financial situation was the reason they couldn't afford a CT scan and other investigations at the time of discharge and follow ups.

Table 10
Diet regimen.

Time	Diet regimen
6.30 am	Turmeric milk or Chukku coriander milk
8.00 am	Idiappam or Idli with Dhal or Sambar
10.30 am	Fruit Juice or Salad
12.00 noon	*Peyan* or *Sirumalai vazhaipazham* (banana)
1.30 pm	Rice or *Karunkuruvai* or Barley *Kanji* with pepper gravey and pepper *rasa*m or *panchamutti kanji* or *chukku mudichu kanji* with green leaf cereal *koottu*
3.00 pm	Vegetable Juice or Soup
5.00 pm	*Paruppu sundal* (boiled lentils)
7.00 pm	Idli or Utthappam (without oil) and Coriander Chutney
8.00 pm	*Peyan* or *Sirumalai vazhaipazham* (banana) and *Chukku* milk

- It was difficult for the maintenance personnel to keep the atmosphere clean and sanitary because they were concerned about the spread of infection.

8.2. Strength

It has been observed that the patient's condition had not worsened. As a result, it may be assumed that the treatment of COVID-19 with the prescribed *Siddha* medications halted the disease progression to a more critical stage. Despite having a severe cough and fever of more than 39.1 °C, the patient did not deteriorate. The positive findings were recorded that patients with dyspnea and oxygen saturation levels below 90% recovered in an average span of 7 days. Other mild to moderate symptoms such as fever, cough, anosmia, and nausea also needed 1–2 weeks to resolve. As a result, the duration of the disease was reduced as a result of the given Siddha drugs.

According to the *Thirukural* "*Marundhena vaentaavaam yaakkaikku arundhiyadhu atradhu poatri unin,*" the food aid in the patients' rapid recovery. According to *Siddha* pathophysiology, the fundamental cause of fever and disease progression is the aggravation of *kaba* humor in the colon (*Kudal thannil seetham*). The patients were fed nutritious and easily digestible food as mentioned in Table 10. The drug and diet are the major contributors in the successful treatment outcomes.

9. Conclusion

Metal-based medications *P. chandirodayam* and *G. mathirai* have been proven to be safe and efficacious. Metal based prescriptions given for a specific period does not cause untoward effects on liver and renal functions. It is evident that the trial medicine removes hazardous chemicals from the body and increases life expectancy. Although the number of patients in this case series was small, treating critically ill Covid-19 patients with a combination of *P. chandirodayam* and *G. mathirai* seems promising.

Ethical consideration

We certify that this trial has received ethical approval from Institutional Ethics Committee (IEC), Kokila Siddha Hospital and Research Centre, Madurai (IEC-05/2021 KSHRC). This case series is registered in Clinical Trial Registry of India – CTRI/2021/06/034145.

Patient consent for publication

We state that informed consent was taken from all the patients for this study.

Source of funding

None.

Availability of data and materials

Full de-identified data of the analyses are available upon request to the corresponding author.

Conflict of interest

None.

Author Contribution

Jeyavenkatesh: Conceptualization, Methodology, Writing-Reviewing and Editing, Software. **Saravanapandian:** Data curation, Supervision. **Amali Jancy Margaret:** Project administration, Visualization, Investigation. **Shanmuga Priya:** Writing- Original draft preparation, Validation, Formal analysis, Data Curation.

References

[1] Thiagarajan R. In: Directorate of Indian medicine and Homeopathy; 1992. p. 134–44. Tamilnadu, Chennai.
[2] Muthaliar KNK, Uttamarayan KS. In: Siddha Pharmacopoeia; 1987. p. 167–8. Parinilayam, Chennai.
[3] Mahdihassan S. Cinnabar. Gold as a best alchemical drug of longevity called Makaradhwaja in India. Am J Chin Med 1985;13:93–108.
[4] Austin A, Jagadeesan M, Subramanian S. Toxicological studies of Linga chendooram: a Siddha drug. Indian J Pharm Sci 2002;64:53–8.
[5] Hardy AD, Sutherland HH, Vaishnav R, Worthing MA. A report on the composition of mercurials used in the traditional medicines in Oman. J Ethnopharmacol 1995;49:17–22. 13.
[6] Sudha A, Murty VS, Chanda TS. Standardization of metal based herbal medicines. Am J Infect Dis 2009;5:193–9.
[7] Hazeena Begum V, Muthukumaran P. Phytochemical and free radical scavenging activity of Poorna chandrodayam chendooram (metallic herbal based drug). J Phytopharmacol 2014;3(6):418–22.
[8] Owshadham monthly edition, mooligai maruthuvam. 31; Oct 2018.
[9] Sv P, Lathabhavan R, Ittamalla R. What concerns Indian general public on second wave of COVID-19? A report on social media opinions [published online ahead of print, 2021 Apr 14]. Diabetes Metab Syndr 2021;15(3):829–30. https://doi.org/10.1016/j.dsx.2021.04.001.