



Case Report

Integrative management of critical case of Covid 19 with *Ayurveda* and modern medicine: A case reportAmit Nakanekar^{a, *}, Siddharth Kulkarni^b, Punam Khobarkar^a, Minal Belsare^c^a Department of Kayachikitsa Government Ayurved College, Nagpur, India^b Yogeshwari Hospital, Daund, India^c Intern Student Government Ayurved College, Nagpur, India

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ABSTRACT

Covid 19 pandemic has placed challenges in front of medical health fraternity in terms of management, prevention and immunity building. Effectiveness of any medication has not conclusively proven; hence there is need for integrative management of Covid 19. We have managed a critical case of Covid-19 having history of thalassemia, hypothyroidism with integrative management of *Ayurveda* and modern medicine. A male patient (59 years of age) with history of thalassemia had complaints of cough and breathlessness since 4 days. He performed RT PCR because of his exposure to a Covid positive cases in immediate family. He was treated with Favipiravir at home for 5 days. He deteriorated on 6th day with SPO₂ dropped to 75%, temp raised to 101 F and respiratory rate (RR) raised to 45/min. He was admitted in Yogeshwari Hospital Daund, Maharashtra; treated with oxygen inhalation, Remdesvir and *Ayurveda* medicines in intensive care unit (ICU). *Ayurveda* treatment protocol was advised through telemedicine. Significant improvement in clinical symptoms and normal HRCT was observed at completion of treatment. This case report provides further directions for integrative management in cases of Covid 19. Further clinical research studies in this direction are warranted.

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1. Introduction

As per World Health Organisation's (WHO) 17-10-2020 report, globally there were 39, 196, 259 confirmed cases of Covid-19 and 1,101,298 deaths [1]. Acute respiratory distress syndrome (ARDS) is a major culprit that causes death and interferes with treatment and affects recovery in Covid 19 patients. Cytokine storm, immune dysfunction increases the risk of mortality [2]. A Double blind clinical trial on effectiveness of Remdesvir in Covid 19 shows statistically insignificant results [3] Through WHO's Solidary trial on repurposed antiviral drugs in Covid 19, it was reported that Remdesvir is minimally effective in hospitalized Covid 19 patients [4]. Some studies have reported that hypoxemic respiratory failure is one of the important cause of death in critically ill patients of Covid 19 [5].

A position statement by international thalassemia federation says that there is a knowledge gap and lack of epidemiological evidence in Covid 19 infections in thalassemia patients. It also mentions that Covid 19 pandemic represents a significant challenge for such patients [6]. A critically ill thalassemia patient with SARS-COV2 infection represents a great challenge for its management. Recent review articles have also advocated Evidence based knowledge of ancient Indian system, this may open a new door of integration for overall improvement in Covid 19 patients [7]. Some of the recent editorials by important journals on *Ayurveda* and integrative medicine also emphasizes role of AYUSH interventions on Covid 19 management [8]. Critical analysis of AYUSH interventions on covid 19 management shows that none of the trial includes thalassemia patients [9].

Covid 19 can be correlated with *Janapadodhwansa Vikara* (epidemic disease) [10]. Some published articles emphasize true potential of Ayurveda for treatment of Covid 19 patients [11] There are few case reports published on *Ayurveda* management of Covid 19 cases [12,13]. This particular case of Covid 19 with history of thalassemia presented as hypoxemic emergency is important,

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because this case is managed in critical care unit with integrative protocol of *Ayurveda* and modern medicine.

2. Patient information

A 59 years' male patient had complaints of cough, breathlessness and mild fever since 4 days. He had history of intermittent blood transfusions since 10 yrs. In spite of earlier blood transfusions, diagnosis of thalassemia was made 2 months ago; reports before that were unavailable. Patient received 3 points of blood transfusion as advised by physician two months ago. He also has a history of hypothyroidism, hemorrhoids since 15 years and tobacco addiction since 25 years.

He suspected covid infection because he has cough, weakness and he came in close contact with his daughter who was Covid positive (daughter positive on 25/7/2020). RT-PCR confirmed Covid 19 positive status. He took oral Favipiravir (Tablet. Fabiflu) at home for 5 days but his condition was worsening. Hence he was admitted at Yogeshwari hospital, Daund, Maharashtra on 6th day. Patient's general condition was poor. His SPO₂ was 75 % respiratory rate 45/min and temp was 101 F.

3. Clinical findings

General clinical examination was performed by physician SK. Patient's general condition was poor. Temperature was 101 F at the time of admission, pulse 140/min, blood pressure 120/70 mm/hg. SPO₂ was 75%. Respiratory rate was 45/min. Bilateral coarse crepitation's, reduced air entry with dull ache in right basal region of chest was noted.

Graph 1 represents day wise temperature, pulse and SPO₂. *Ayurveda* examination was done telephonically and through what's app video call by AN as per the method reported by Rastogi et al. [14].

During *Ashtavidha Parikshan* (~eight fold diagnostic approach) constipation (~*Malavshambh*) was present, *Jivha* (~tongue) was coated, *Shabda* (~speech) was *Spasht*, *Drik* (~vision) was normal, *Aakriti* (~body built) was *Krish* (~lean). *Agni* (~metabolic power) was accessed telephonically as per method reported by Patil et al. [15]. *Nadi* (~pulse) could not be accessed.

Dashavidh Parikshan (~tenfold diagnostic approach) was performed by MB just few days before episode of Covid 19. It showed

Prakriti - *Vatpittaj*, *Sar-Madhyam*, *Samhanan- Madhyam*, *Satva-Madhyam*, *Satmya-Madhyam*, *Desh- Sadharan*, *Vaya- Madhyam*, *Kal-Varsha Ritu*.

After possible examinations we could conclude that *Pranvaha* (~respiratory system), *Annavaha* (~gastrointestinal system), *Purishvaha* (~excretory system) and *Ras vaha Strotas* (~lymphatic system) were affected.

Systemic examination was performed by treating physician (SK) showed reduced air entry bilateral crepitation's, cardiovascular sounds were within normal limits. Neurologically he was stupor but oriented.

Details of clinical symptoms from the onset of symptoms to complete relief are described in Table 2.

4. Diagnostic assessment

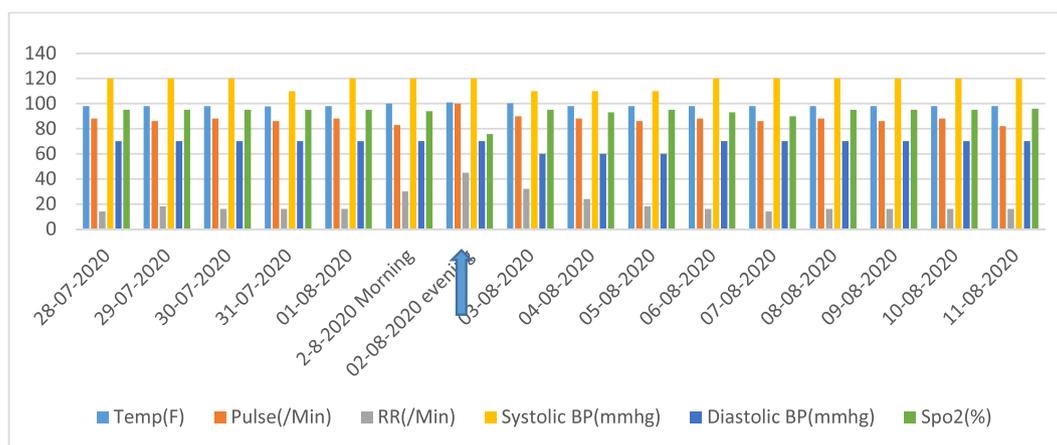
Patient was diagnosed - Covid positive by RTPCR (28/7/2020). Computerized tomography of thorax on dated 26/7/2020 showed subtle patchy ground glass opacities in Right lower lobe. Evidence of alveolar infiltrate, suspected early changes of Covid-19 infection (CORAD-3). C-reactive protein was 34.6 ng/dl, D-dimer was 309 ng/ml, Serum sodium was 134.1 MEq/L, Serum potassium was 4.11 MEq/L. Date wise details of investigations are mentioned in Table 1.

5. Therapeutic intervention

Initially Tablet Fabiflu along with other medications was prescribed for 5 days. On 6th day his SPO₂ dropped to 75 % with increase in body temperature (101 F) and respiratory rate increased to 45/min. Hence patient was shifted to ICU. He required 15 Liter/min of Oxygen for 12 h. Considering the severe breathlessness and hypoxia Fabiflu was discontinued and Injection of Remdesvir was prescribed. *Ayurveda* medications were prescribed along with existing modern medical treatment in ICU. Treatment plan along with rationale mentioned in Tables 2 and 3. *Ayurveda* treatment was planned considering treatment principles of *Vatkaphaj Sannipataj Jwara* along with treatment principles of *Strotas* involved [12].

6. Follow up and outcomes

Ayurveda treatment along with modern medicine brought reduction in symptoms cough, breathlessness and fever. His SPO₂



Graph 1. Datewise Temp, Pulse, Respiratory rate, blood pressure, SPO₂.

Table 1
Investigations.

Coombs test (24/5/2020)	Negative for complete antibodies at 37.5 °C Negative for incomplete antibodies at 37.5 °C		
Bone marrow biopsy (25/5/2020)	Bone marrow shows compensatory response to anaemia with features of Vitamin B12/folic acid deficiency. No definite evidence of malignancy		
Folic acid (27/5/2020)	5.49 ng/ml		
Abnormal haemoglobin Studies (25/5/2020)			Suggestive of beta thalassemia trait.
Fetal Haemoglobin	0.5		
Haemoglobin A O	95.2		
Haemoglobin A2	5.3		
Reticulocyte	2.6		
28/5/2020) USG Abdomen and pelvis	Mild splenomegaly is noted without any focal lesion. Cholelithiasis without changes of cholecystitis Mild hepatomegaly with grade II fatty infiltration of the liver Gaseous distension and dilatation of the entire colon.		
26/7/2020 RTPCR Covid	Positive		
	2/8/2020	4/8/2020	23/8/2020
Haemoglobin	8.6 gm/dl	8.3 gm/dl	
HCT	31.8%	30.2%	
MCV	65.2 fl	65 fl	
MCH	17.5% pg	17% pg	
MCHC	26.9 gm/dl	27.3 gm/dl	
RDW-CV	0.136	0.136	
RDW-SD	37.2 fl	37.1 fl	
RBC	$4.87 \times 10^6/\mu\text{L}$	$4.65 \times 10^6/\mu\text{L}$	
WBC	$6.18 \times 10^3/\mu\text{L}$	$2.83 \times 10^3/\mu\text{L}$	
Neutrophil	0.883	0.536	
Lymphocytes	0.082	0.261	
Monocytes	0.033	0.120	
Eosinophil	0.001	0.080	
Basophils	0.001	0.003	
Platelet count	$203 \times 10^3 \text{ u/L}$	$162 \times 10^3 \text{ u/L}$	
CRP	36.2 mg/dl		3 mg/dl
D-Dimer	309 ng/ml	204.27 ng/ml	167.65 ng/ml
S. Sodium	134.1 mEq/L	139 mEq/L	
S.Potassium	4.11 mEq/L	3.64 mEq/L	
S.Chloride	108 mEq/L	110.3 mEq/L	
Total bilirubin	0.83 mg/dl		
Direct Bilirubin	0.33 mg/dl		
Indirect Bilirubin	0.50 mg/dl		
SGOT	48IU/L		
SGPT	43IU/L		
S. Alkaline Phosphatase	209		
Creatinine	1.16 mg/dl		
UREA	43 mg/dl		
SLDH	583IU/L		
Sr. ferritin			886.45 ng/ml
CT THORAX			
26/7/2020	5/8/2020	23/8/2020	
Subtle patchy ground glass opacities in Right lower lobe s/o alveolar infiltrate, however early changes of Covid-19 inf. Cannot rule out (CORADS3)	Atypical organizing pneumonia	No Significant abnormality in present study	
Comment:- Swab testing RT PCR And Follow CT Thorax would help	Quality for CORADS-5 and CT severity score 7 (mild infection)		

improved gradually with reduction of requirement for oxygen. Date wise changes in pulse, blood pressure, respiratory rate, body temperature, SPO₂ are mentioned in [graph 1](#). Improvements in digestion, appetite were also observed gradually as mentioned in [Graph 2](#).

HRCT on 5/8/2020 detected atypical organizing pneumonia quality for CORADS-5 and CT severity score was 7. HRCT dated 23/8/2020 does not show any significant abnormality. [Graph 1,2](#) represents clinical changes. It was not possible to conduct HRCT when patient was serious hence clinical judgement along with blood investigations were served as criteria to assess the patient.

Oxygen requirement gradually decreased and patient could maintain oxygen level without oxygen supply after 48 hours of starting *Ayurveda* intervention. *Ayurveda* and modern treatment continued as per [Table 2](#). Time line graph ([Graph 1,2](#)) describes summary of total course of the case.

7. Discussion

Covid 19 is a newly emerged disease and can be managed by the basic principles of *Anukta Vyaadhi* on the basis of *Dosh, Dushya, Sthan* and various pathological processes involved (*Charak chikitsa sthan chapter 30*) [16]. A physician with knowledge of various disciplines of sciences can take good decisions for his patients [17]. Hence an integrative approach is advocated in *Ayurveda*. Covid 19 falls under the category of *Agantuj Jwara*. On the basis of causative factors *Agantuj Jwara* is divided into 4 subtypes. Out of these 4 subtypes SARS COV2 is considered as *Abhishangaj Jwara* [18].

Ayurveda based Properties of various herbs/formulations included in management of this patient are described in [Table 3](#). Combination of *Sunthi* (Zingiber Officinale), *Pushkarmul* (Inula Racemosa), *Kantkari* (Solanum Xanthocarpum) and *Guduchi*

Table 2
Details of Treatment.

	Modern Medicine	Ayurveda medicine	Symptoms
28/7/2020	1) TAB. Fabiflu 200 9-0-9*1day 4-0-4*7day 2) TAB Rebex D 1-0-0 3) capD3 HD 1-0-0(Once) 4) TAB Vit A 1-0-0 5) TAB Vit C 500 1-0-1 6) TAB A-Z Gold 1-0-0 7) Inj. Clexane 1-0-0 8) TAB Cettas 200 1-0-1		Cough No Fever No any other symptoms
29/7/2020	1) TAB. Fabiflu 200 9-0-9*1day 4-0-4*7day 2) TAB Rebex D 1-0-0 3) CAP.D3 HD 1-0-0(Once) 4) TAB. Vit A 1-0-0 5) TAB Vit C 500 1-0-1 6) TAB A-Z Gold 1-0-0 7) Inj. Clexane 1-0-0 8) TAB. Cettas 200 1-0-1		Cough No Fever No any other symptoms
30/7/2020	1) TAB. Fabiflu 200 9-0-9*1day 4-0-4*7day 2) TAB Rebex D 1-0-0 3) capD3 HD 1-0-0(Once) 4) TAB. Vit A 1-0-0 5) TAB. Vit C 500 1-0-1 6) TAB. A-Z Gold 1-0-0 7) Inj. Clexane 1-0-0 8) TAB Cettas 200 1-0-1		Cough No Fever No any other symptoms
31/7/2020	9) TAB Fabiflu 200 9-0-9*1day 4-0-4*7day 10) TAB. Rebex D 1-0-0 11) CAP.D3 HD 1-0-0(Once) 12) TAB Vit A 1-0-0 13) TAB Vit C 500 1-0-1 14) TAB A-Z Gold 1-0-0 15) Inj. Clexane 1-0-0 16) TAB. Cettas 200 1-0-1		Cough No Fever No any other symptoms
1/8/2020	1) TAB. Fabiflu 200 9-0-9*1day 4-0-4*7day 2) TAB. Rebex D 1-0-0 3) CAP.D3 HD 1-0-0(Once) 4) TAB. Vit A 1-0-0 5) TAB. Vit C 500 1-0-1 6) TAB. A-Z Gold 1-0-0 7) Inj. Clexane 1-0-0 8) TAB. Cettas 200 1-0-1		Cough No Fever Breathlessness
2/8/2020	1) Inj. Remdesevir 100 mg OD 2) Inj. Durataz 4.5 mg in 100NS TDS 3) Inj. Rabicip 20 mg OD 4) Inj. Ondem 4 mg TDS 5) Inj. Dexa 4 mg TDS 6) Inj. Clexane 0.6 OD 7) TAB. Colchicine 100 mg BD 8) TAB. Viznil HS 9) TAB. Bandy plus BD 10) SYP. Ascoril 2 Tsp TDS 11) NS/RL 8hrly 12) Oxygen therapy	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + <i>Rasa Sindur</i> 1 gm (21 packets) 1 packet with warm water tds 2) <i>Sanshmani Vati</i> with warm water 3 tab TDS 3) <i>Haridra + Yasathimadhu</i> gargles	Cough Fever Breathless-ness Hypoxia
3/8/2020	1) Inj. Remdesevir 100 mg OD 2) Inj. Durataz 4.5 mg in 100NS TDS 3) Inj. Rabicip 20 mg OD 4) Inj. Ondem 4 mg TDS 5) Inj. Dexa 4 mg TDS 6) Inj. Clexane 0.6 OD 7) TAB. Chalchicine 100 mg BD 8) TAB. Viznil HS 9) TAB. Bandy plus BD 10) SYP. Ascoril 2 Tsp TDS 11) NS/RL 8hrly 12) Oxygen therapy	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + <i>Rasa Sindur</i> 1 gm (21 packets) 1 packet with warm water tds 2) <i>Sanshmani Vati</i> with warm water 3TAB TDS 3) <i>Haridra + Yasathimadhu</i> gargles	Cough Breathless-ness
4/8/2020	1) Inj. Remdesevir 100 mg OD 2) Inj. Durataz 4.5 mg in 100NS TDS 3) Inj. Rabicip 20 mg OD 4) Inj. Ondem 4 mg TDS 5) Inj. Dexa 4 mg TDS 6) Inj. Clexane 0.6 OD 7) TAB Chalchicine 100 mg BD 8) TAB Viznil HS 9) TAB Bandy plus BD 10) SYP Ascoril 2 Tsp TDS 11) NS/RL 8hrly	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + <i>Rasa Sindur</i> 1 gm (21 packets) 1 packet with warm water tds 2) <i>Sanshmani Vati</i> with warm water 3tab TDS 3) <i>Haridra + Yasathimadhu</i> gargles	Cough No other compliants

Table 2 (continued)

	Modern Medicine	Ayurveda medicine	Symptoms
5/8/2020	1) Inj. Remdesevir 100 mg OD 2) Inj. Durataz 4.5 mg in 100NS TDS 3) Inj. Rabicip 20 mg OD 4) Inj. Ondem 4 mg TDS 5) Inj. Dexa 4 mg TDS 6) Inj. Clexane 0.6 OD 7) TAB Chalchicine 100 mg BD 8) TAB Viznil HS 9) TAB Bandy plus BD	1) Sunthi + Kantakari + Pushkarmul + Guduchi each 20 gm + Rasa Sindur 1 gm (21 packets) 1 packet with warm water tds 2) <i>Sanshamani Vati</i> with warm water 3 tab TDS 3) <i>Haridra + Yasathimadhu</i> gargles	Cough No other compliants
6/8/2020	1) <i>Inj. Remdesevir</i> 100 mg OD 2) <i>Inj. Durataz</i> 4.5 mg in 100NS TDS 3) <i>Inj. Rabicip</i> 20 mg OD 4) <i>Inj. Ondem</i> 4 mg TDS 5) <i>Inj. Dexa</i> 4 mg TDS 6) <i>Inj. Clexane</i> 0.6 OD 7) <i>TAB Chalchicine</i> 100 mg BD 8) <i>TAB Viznil HS</i> 9) <i>TAB Bandy plus BD</i> 10) <i>SYP Ascoril 2 Tsp TDS</i> 11) <i>NS/RL 8hrly</i> <i>*Pt shifted to general ward</i>	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm with warm water for 7 days tds 2) <i>Sanshamani Vati</i> with warm water 1-1-1 *7days 3) <i>Haridra + Yasathimadhu</i> gargles	Cough
7/8/2020	1) Inj. Durataz 4.5 mg in 100NS TDS 2) Inj. Rabicip 20 mg OD 3) Inj. Ondem 4 mg TDS 4) Inj. Dexa 4 mg TDS 5) Inj. Clexane 0.6 OD 6) TAB Chalchicine 100 mg BD 7) TAB Viznil HS 8) TAB Bandy plus BD 9) SYP Ascoril 2 Tsp TDS 10) NS/RL 8hrly	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + Rasa Sindur 1 gm (21 packets) 1 packet with warm water tds 2) <i>Sanshamani Vati</i> with warm water 3 tab TDS 3) <i>Haridra + Yasathimadhu</i> gargles 4) <i>Trifala + Yastimadhu</i> Gargles	Cough Constipations and mouth ulcer
8/8/2020	1) Inj. Durataz 4.5 mg in 100NS TDS 2) Inj. Rabicip 20 mg OD 3) Inj. Ondem 4 mg TDS 4) Inj. Dexa 4 mg TDS 5) Inj. Clexane 0.6 OD 6) TAB Chalchicine 100 mg BD 7) TAB Viznil HS 8) TAB Bandy plus BD 9) SYP Ascoril 2 Tsp TDS 10) NS/RL 8hrly	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm with warm water for 7 days tds 2) <i>Sanshamani Vati</i> with warm w ater 3 TAB TDS 3) <i>Haridra + Yasathimadhu</i> gargles 4) <i>Trifala + Yastimadhu</i> Gargles	Cough Constipations and mouth ulcer
9/8/2020	1) Inj. Durataz 4.5 mg in 100NS TDS 2) Inj. Rabicip 20 mg OD 3) Inj. Ondem 4 mg TDS 4) Inj. Dexa 4 mg TDS 5) Inj. Clexane 0.6 OD 6) TAB Chalchicine 100 mg BD 7) TAB Viznil HS 8) TAB Bandy plus BD 9) SYP Ascoril 2 Tsp TDS 10) NS/RL 8hrly	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + <i>Rasa Sindur</i> 1 gm (21 packets) 1 packet with warm water for 7 days tds 2) <i>Sanshamani Vati</i> with warm water 3 tab TDS 3) <i>Haridra + Yasathimadhu</i> gargles 4) <i>Trifala + Yastimadhu</i> Gargles	Cough Constipatio-ns and mouth ulcer
10/8/2020	1) TAB Omnix 200 mg BD 2) TAB Drego D OD 3) TAB Doxivent 200 mg BD 4) TAB Wysolone 20 mg OD 5) TAB Goutnil 0.5 mg HS 6) TAB Supra plus OD 7) TAB Viznil HS PT got Discharged	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + <i>Rasa Sindur</i> 1 gm (21 packets) 1 packet with warm water for 7 days tds 2) <i>Sanshamani Vati</i> with warm water 3 TAB TDS 3) <i>Haridra + Yasathimadhu</i> gargles 4) <i>Trifala + Yastimadhu</i> Gargles	Cough mouth ulcer No other Compliant
11/8/2020	1) TAB Omnix 200 mg BD 2) TAB Drego D OD 3) TAB Doxivent 200 mg BD 4) TAB Wysolone 20 mg OD 5) TAB Goutnil 0.5 mg HS 6) TAB Supra plus OD 7) TAB Viznil HS	1) <i>Sunthi + Kantakari + Pushkarmul + Guduchi</i> each 20 gm + <i>Rasa Sindur</i> 1 gm (21 packets) 1 packet with warm water for 7 days tds 2) <i>Sanshamani Vati</i> with warm water 3 TAB TDS 3) <i>Haridra + Yasathimadhu</i> gargles 4) <i>Trifala + Yastimadhu</i> Gargles	Cough mild and mouth ulcer No other Compliant

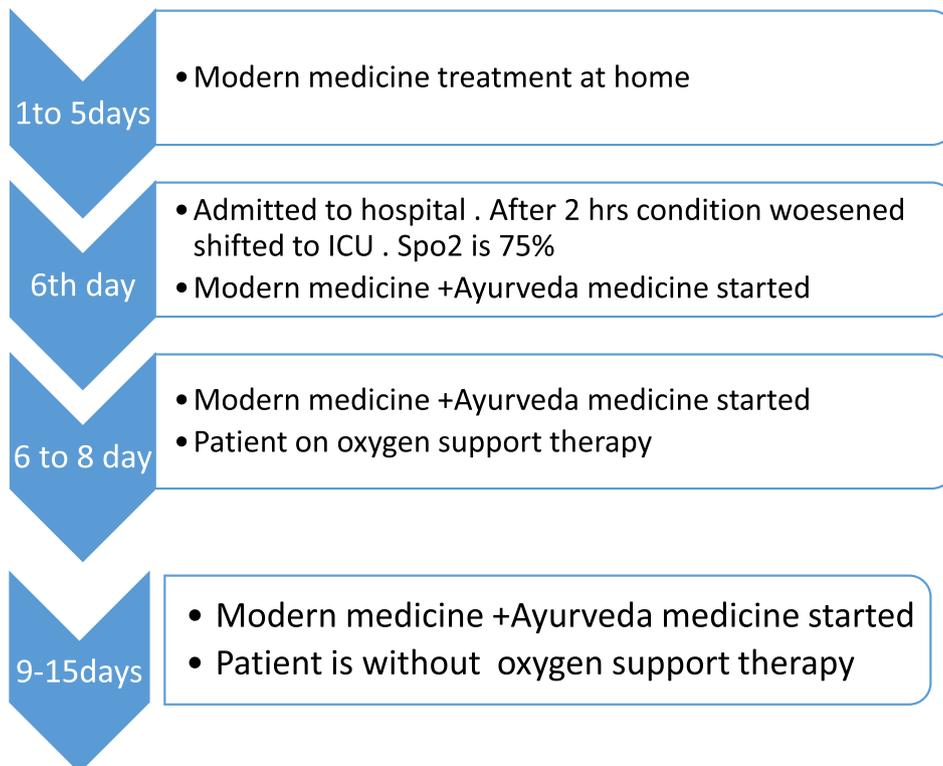
(*Tinospora Cordifolia*) are indicated in *Vatkaphaj Jwar* having symptoms of *Shwas* (dyspnoea), *Kas* (cough) and *Parshwashool* (pain in lateral side of chest) [19]. *Rasa Sindur* acts on *Amashaya*, *Ura* and various site of *Kapha*. It is mostly used in Vitiated *Kapha Dosha* with involvement of *Rasa*, *Mansa* as *Dushya*. It is also indicated in cases

where one needs to increase speed of pharmacodynamics of the formulation (~*Yogvahi*) [20] *Guduchi* is an crucial ingredient of *Sanshamani Vati* considering *Rasayan*, *Jwarghna*, and its action on *Vaat-kapaha Rakta* Sannipat as mentioned by *Charaka*. Higher doses of *Sanshamni Vati* were used to achieve fast recovery [21]. *Triphala*

Table 3
Ayurvedic properties of medicines used.

Medicine	Properties	Action
<i>Sunthi churna</i>	Guna-laghu, Snigdha Ras-Katu Vipak- Madhur Virya – Ushna	Pachan, Vibandhabhedan, Kaphavataghna Used in Shwas, kas, Arsh, Aruchi
<i>Guduchi churna</i>	Guna-Laghu, Snigdha Rasa-Tikta, Kashay Vipak-Madhur Virya-Ushna	Rasayan, Balya, Deepan, Tridoshaghna Used in Kasa
<i>Kantakari churna</i>	Guna-Laghu, Ruksha, Tikshna Rasa-Tikta, Katu Vipak-Katu Virya-Ushna	Kaphavataghna, Deepan, Jwaraghna, Pachan, Used in all types of Kas and Shwas
<i>Pushkarmul churna</i>	Guna-Laghu, Ruksha Rasa-Tikta, katu Vipak-Katu Virya-Ushna	Kaphavataj jwarhar, Used in kas, shwas, parshwshul
<i>Yashtimadhu churna</i>	Guna-Guru, Snigdha Ras-Madhur Vipak- Madhur Virya – Shit	Pitta vataghna Kanthya
<i>Haridra churna</i>	Guna-Ruksha, Laghu Rasa-Tikta, Katu Vipak-Katu Virya-Ushna	Used in kas, Shwas, Vran
<i>Triphala Churna</i> <i>Sanshamani Vati</i> <i>Rasa Sindur</i>	Rasa-Tikta	Kaphapittaghna. Rasaayan, Deepan, Jwaraghna, Anulomak Used in Kas, Shwas, Jwar

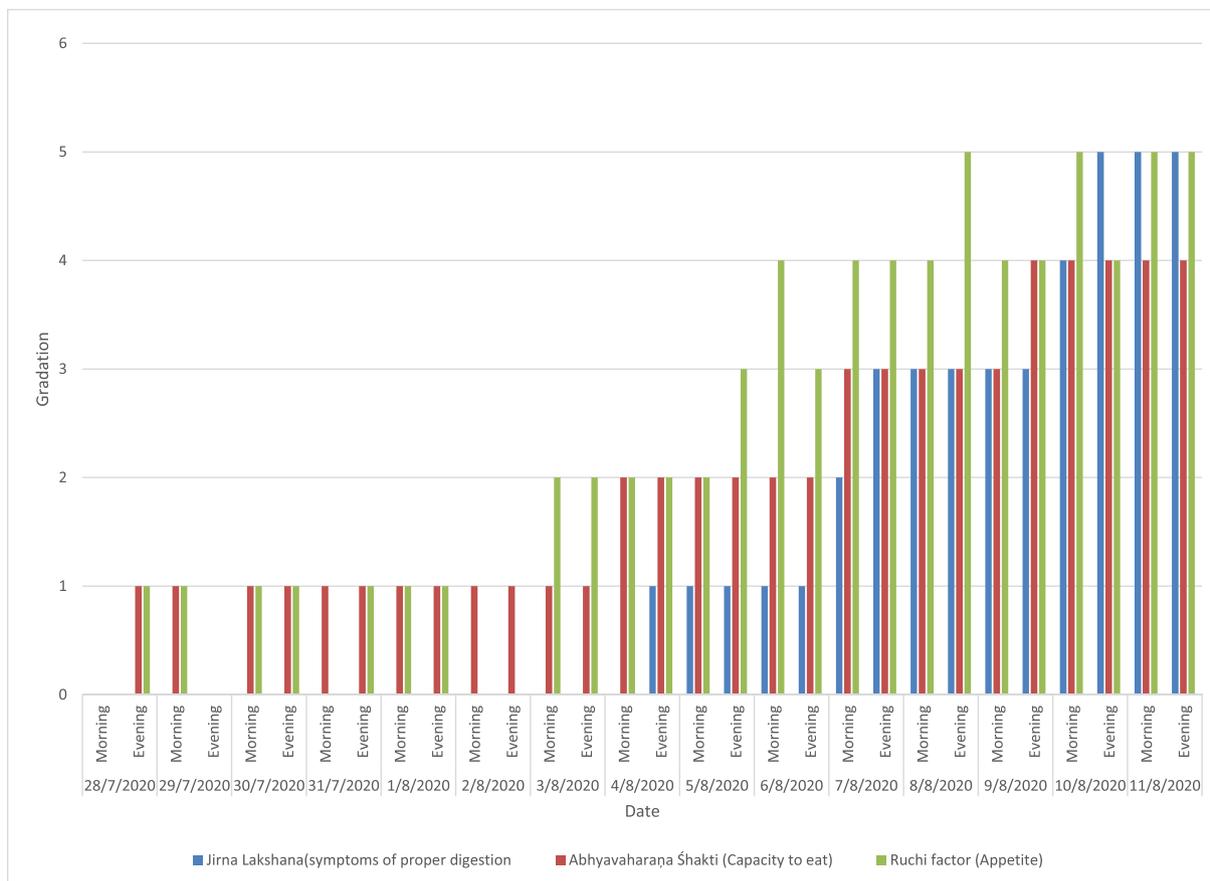
Timeline



used considering its *Visham Jwarghna, Kanthya, Rasayan, Anulomak* properties [22]. Most of the *Ayurveda* medicines used in this case also have targeted action on gastrointestinal track (GIT) and improved various digestion related symptoms (Graph 2). It is also well known that Covid -19 virus down regulates ACE-2 receptors. These receptors are mainly situated on lungs and GIT [23]. We

believe *Ayurveda* treatment may target up regulation of ACE-2 receptors through its action on *Agni* (~metabolic power) and GIT. *Ayurveda* treatment can also target through gut mediated immune response and there by bringing recovery in this case.

In China, Ministry of Science and Technology launched integrative treatment of traditional Chinese medicine and western



Graph 2. Score of symptoms of proper digestion, Capacity to eat, Appetite.

medicine in Covid 19 [24]. Many of scholars have documented the importance breaking the walls and forming the bridges between different branches of science and different people who serve science [25]. Scientifically integrative approach means bringing both conventional and complementary approaches in a co-ordinated way with holistic patient centred approach. This also brings emotional, functional and physical wellbeing and restores health of patient after recovery from diseases [26]. This case was treated with same approach ensuring the complete wellbeing. Few studies have reported that mortality rate in Covid-19 patients with pre-existing beta thalassemia was much higher than Covid-19 patients without thalassemia. Pre-existing haemoglobin defects also causes increased mortality in Covid-19 individuals [27]. Various other pathological parameters like D-dimer, C reactive protein (CRP), LDH and Serum Ferritin also contribute to define prognosis of Covid-19 patients. We could also achieve decrease in D-dimer and CRP by reducing inflammation and modulating immunity through gut [28].

Use of newer methods of Ayurveda consultation (telemedicine), use of Ayurveda treatment in critical care unit, application of Ayurveda principles in combination with modern medicine, treating a critical patient with history of thalassemia, achieving success with team efforts, utilisation of many aspects of developments in communication, use of developments in modern science and amalgamation of all this with ancient wisdom were some important achievements. This case report can also serve as an example of mutual respect, trust and team work of modern medicine practitioners and Ayurveda practitioners with patient centred approach. However, there are very few such documented cases with this approach and almost nil for Covid.19.

8. Patients perspective

Initially I was reluctant to start Ayurveda treatment but both of my daughters started taking it (they were Covid positive.). They were quite comfortable and had less severe symptoms. Later I had many health complications, got respiratory difficulties and fever, hence I started Ayurveda treatment with allopathic treatment. Both Ayurveda and modern doctors communicated very well and planned my treatment very well. I am much happy and satisfied now with this integrative approach during my treatment.

9. Informed consent

Patient has given informed consent for publication of this case report.

10. Conclusion

This case report gives us a future direction for integrative management in cases of Covid 19. This case report also gives leads in application of integrative protocols in critical care medicine. Further clinical research studies in this direction are warranted.

Conflict of interest

Nil.

Author contributions

Conceptualization and Treatment Plan - AN, SK.

Rough Draft and Ayurveda formulation preparation - PK, MB.
 Critical Editing of Draft - AN, PK.
 Data Collection - AN, SK.
 Data Presentation - AN, PK, MB.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jaim.2021.07.012>.

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