Case study on the effect of T-AYU-HM Premium along with modern medicines in Covid-19 patient with comorbidities

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***Abstract*: Patients with existing comorbidities or those who are elderly have a poor prognosis. Generally, existing comorbidities in covid-19 patients exhibit increased chances of mortality and require a longer treatment period. This pandemic has now reached a stage where there is a dire need to incorporate an integrated treatment approach for combating such conditions. Here, we present a case study on the clinical outcome of the integrated treatment approach in Covid-19 patients with pre-existing comorbidities. The patient is a known case of type 2 diabetes mellitus, hypertension, hypothyroidism, and arthritis. He was on his medication at the time. On infection with coronavirus, he was advised of the standard treatment plan and strict home quarantine. He presented to the covid-19 healthcare center with complaints of weakness, breathlessness on exertion, cough, loss of appetite. On examination, he had a 93% oxygen saturation and had hematological findings; CRP 33.3(mg/dL), ESR 112(mm/hour), D-dimer 2470(ng/mL), LDH 2485 (Units/L), RBS 596 mg/d. He provided his informed consent to proceed with the integrated treatment approach. The integrated treatment approach along modern medicine includes T-AYU-HM Premium 600mg and Acupen 600mg thrice a day. The treatment plan has resulted in remarkable improvement in the clinical profile and the inflammatory markers of patients. It has managed the blood glucose level in the patient and preventing unwanted complications associated with it. This case study provides information about the importance of an integrated treatment approach in the treatment of Covid-19 with existing co-morbidities.**

***Keywords*: Covid-19, T-AYU-HM Premium, D-Dimer, CRP, ESR, Comorbidities**

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Introduction: Covid-19 has impacted public health and the economy severely during the second wave in India. The impact was faster, involved rural areas, and mainly affected the younger population and children. During the second wave, the variant strain increased the oxygen demand and extended the hospitalization period. This pandemic has now progressed to the point where an integrated therapy approach to addressing such illnesses is urgently required. It is also essential to consider that patients with pre-existing comorbidities have higher chances to progress to complications in covid-19. [1-4]

Diabetes remains a prime concern in management during covid-19 because it presents both as existing comorbidity and new-onset complication due to altering metabolism or stress-induced response. Patients with type-2 are more prone to influenza and pneumonia infections, and the rate was more if the patients are elderly and had type-2 diabetes. [5] Diabetes problems in coronavirus have also been observed in prior coronavirus strains. Covid-19 exhibits severe inflammatory conditions recognized by the multiple metabolisms. In response, inflammatory mediators and oxidative stress increase; this might be a reason for complications in a patient with diabetes. [6-7] Multiple studies and researchers are working on solving the mystery of new-onset diabetes in covid-19. Patients of covid-19 with existing comorbidities and the elderly have a poor prognosis. There is always an increased chance of infection in a patient having comorbidities or elderly. Generally, existing comorbidities in covid-19 exhibit an increased chance of mortality and require an extended treatment period.

Case study: Here, we present a case study on the clinical outcome of the integrated treatment approach in Covid-19 patients with existing comorbidities recorded during the second wave of coronavirus infection in India.

Site information: The case study was conducted at the Covid-19 healthcare center in Vyara, Gujarat, operated by Dhanvantari Clinic – Ayurvedic Health Care and Research Centre. For the treatment of moderate to severe patients, the covid-19 healthcare center is equipped with an oxygen concentrator and BIPAP devices. As a corona warrior, an ayurvedic physician, and a modern medicine practitioner have rendered outstanding service to the center.

Patients consent: Patient and his family decided to admit to the covid-19 center and willing to receive the integrated treatment. Before initiating the treatment, the patient had provided his informed consent for sharing vitals, laboratory findings and treatment outcomes for publication

Patient's demographics information: Mr X is a 40-year-old living in the Tapi district.

Patient's history: The patient is a known case of type 2 diabetes mellitus, hypertension, hypothyroidism, and arthritis; and he has been on treatment for the same. On April 24, 2021, the patient was diagnosed with covid-19 and advised to follow the standard treatment plan and strict home quarantine.

Patient current status: The patient presented to the Dhanvantari Covid Care Centre on 10/05/2021 with complaints of cold, cough, weakness, breathlessness on exertion and loss of appetite. On examination, his oxygen saturation was 93%. A hematological examination was also performed to assess the exact clinical profile of patient. Following reports mentioned in table-1 are observed during evaluation on the date of admission of the patient.

Table 1: Patient's clinical profile on the date of admission

Parameters	**Values**
Hemoglobin(mg/dl)	13.55
RBC(millions per mm^3)	5.33
WBC(per mm^3)	8500
Platelets(per mm^3)	309000
Neutrophils (%)	76
Lymphocytes (%)	21
ESR(mm/hour)	112
CRP(mg/dL)	33.2
D-Dimer(ng/mL)	2470
LDH(Units/L)	2485
Interlukin-6	10.6
Urine analysis	Poly urination
RBS(mg/dl)	596
Blood pressure (mmHg)	98/60
Spo2 (%)	93

Patient's treatment record: The patient received oxygen at a rate of 5 liters per minute for two hours, as part of an integrated treatment plan that included continuous clinical profile monitoring. A patient was started on integrated treatment approach for preventing further internal complications. Treatment profile and symptomatic improvement in patient is mentioned below table 2.

Table 2 Treatment chart and its impact on symptoms

Date	**Presentation**	**Parental**	**Ayurvedic medicines**	**Modern medicines**
10/05/2021	• Fever • Weakness • Cough • breathlessness on exertion • loss of appetite	• Inj. LMWH 40mg SC x OD	• Tab.T-AYU-HM Premium 600mg PO TDS x 5 days • Tab. Acupen 600mg PO TDS x 5 days	• Tab. Eupod 200PO BD x 5 days • Tab. levocet M PO BD x 5 days • Tab. Rantac-D PO BD x 5 days
11/05/2021	• Weakness • breathlessness	• Inj. LMWH 40mg SC x OD		
12/05/2021	• Weakness	• Inj. LMWH 40 mg SC x OD		
15/05/2021	• Weakness		• Tab.T-AYU-HM Premium 600mg PO TDS x 5 days • Tab. Acupen 600mg PO TDS x 5 days	• Tab. Doxy100mg PO BD x 5 days • Tab. levocet M PO BD x 5 days • Tab. Rantac 150 PO BD x 5 days • Tab. Dexona0.5mg PO OD x 5 days • Tab. Zybend400mg PO x OD • Tb. Tribet 1mg PO BD X 10 days
19/05/2021	• Jointpain • Weakness		• Tab. T-AYU-HM Premium 600mg PO BD x 10 days	• Tab. Levoflox 250mg PO OD x 5 days • Tab. EcoprinAV PO OD x 10 days • Tb. Rivaban10mg

				PO OD x 10 days • Cap. Rekool-D PO BD x 10 days • Tb. Tribet 1mg PO BD X 10 days
27/05/2021			• Tab. T-AYU-HM Premium 600mg PO BD x 15 days	• Tb. Tribet 1mg PO BD X 15 days • Cap. Folvite MB PO OD x 15 days
14/06/2021				• Tb. Tribet 1mg PO BD X 15 days • Cap. Folvite MB PO OD x 15 days
Note: Duolin Respule 3ml (Ipratropium bromide 500mcg + levosalbutamol 1.25mg), Budecortrespule 2ml(Budesonide 0.5mg), LMWH 40mg (Enoxaparin), Dexa 4mg (dexamethasone), Levocet M (Levocetirizine 5mg + Montelukast 10mg), Clopilet A 75(aspirin 75mg + clopidogrel 75mg), Azithral 500 (azithromycin 500mg), Tribet 1 (Glimepride 1mg + Metformin 500mg + Pioglitazone 15mg)				

The changes in clinical profile with integrated treatment approach is explained in following table-3

Table-3 laboratory profile of patient during treatment

Parameters	12/05/2021	15/5/2021	19/5/21	27/5/21	14/96/21
Hemoglobin(mg/dl)	13.1	12	12	11	12
RBC(millions per mm^3)	5.29	4.97	4.69	4.60	5.06
WBC(per mm^3)	7200	7300	6400	5800	5600
Platelets(per mm^3)	-	229000	259000	270000	353000
Neutrophils (%)	69	-	67	72	66
Lymphocytes (%)	29	-	29	25	31
ESR(mm/hour)	140	-	62	38	32
CRP(mg/dL)	19.5	7.3	1.6	0.2	0.6
D-Dimer (ng/mL)	-	938.5	870.9	242.1	-
LDH(Units/L)	-	-	189	164	-
RBS (md/dl)	262	216	260	132	92
HbA1C	11.3	-	-	10.36	9.0
Blood pressure (mmHg)	109/69	92/63	-	104/64	103/69
Spo2 (%)	94	95	96	94	98

Discussion: In COVID-19 individuals, diabetes is the third most common underlying comorbidities. Diabetic patients are highly susceptible to infection and are more likely to have several comorbidities, such as cardiovascular disease. A previous study had reported that diabetic patients with covid-19 were more likely to develop pneumonia and were responsible for 11.7% of severe cases. Diabetic patients are further susceptible to hyper-inflammation and the development of cytokine storms due to chronic inflammation. [8-11] Hypoxia-induced consequences progress promptly and cause organ damage. It may be responsible for high patient mortality and sluggish post-covid-19 recovery. The oxygen requirement of the admitted patient steadily improved over time with an integrated treatment approach indicating that hypoxia induced complications is not progressed further. In a prior investigation, the therapeutic dose of low molecular weight heparin and dexamethasone was reported effective in reducing mortality in severe covid-19 patients. [12-13]

In Covid-19, there was a greater incidence of endothelial dysfunction, hypercoagulation, thrombotic events, and microvascular squeal.[14–15] Endothelial dysfunctions caused by diabetes-induced oxidative stress and low nitric oxide levels, as well as a prothrombotic state, are all hallmarks of overt diabetes and these may increase Covid-19-related vascular problems.[16-17] The report on hematological parameters like red blood corpuscles and D-dimer demonstrate improvement in a hypercoagulable state to a normal vascular state in the patient. Therefore, complications in a covid-19 patient with existing diabetes can be reduced.

Previous studies have reported that treatment with insulin in diabetes with covid-19 has a poor prognosis. [18-19] Whereas, there was no clear link was observed between metformin and clinical outcomes in a retrospective study. [20] Blood glucose levels, regardless of diabetes status or other underlying comorbidities, are a critical determinant of disease severity, response to medicinal therapies, and death in Covid-19 patients. Therefore during integrated treatment inpatients prevent the further rise and reduce elevated blood sugar levels prevent complications associated with raised blood sugar levels.

Conclusion: The patient did not present any untoward reactions during the treatment. The patient elevated sugar level was reduced to normal range and sustained within the normal range suggested no further complications associated with sugar. The integrated treatment approach in the covid-19 patient presented a remarkable effect on inflammatory markers like CRP, ESR, and LDH. The oxygen saturation was also improved with time. The success of the integrative treatment in covid-19 patient is apparent in that the patient not only recovered from the symptoms, but also hematological profiles also suggest an observational improvement.

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