

A Case Study on “Metabolic Syndrome with Cervical Spondylosis” and it’s Management through Naturopathy and Yoga

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Abstract

Background: Metabolic syndrome and cervical spondylosis can significantly affect a person’s physical health and daily activities. An integrated approach involving naturopathy and yoga may help address both musculoskeletal symptoms and associated metabolic risk factors.

Case Presentation: A 40-year-old male presented with severe neck pain radiating to the right shoulder and upper arm for one month. The pain was aggravated by prolonged computer work. He was also diagnosed with hypertension, diabetes mellitus and dyslipidaemia, with a history of chronic alcohol consumption and hepatomegaly. His initial investigations showed elevated blood glucose, HbA1c and cholesterol levels. MRI revealed cervical disc bulging with nerve compression at C5–C6 and C6–C7.

Intervention and Outcome: The patient received a 27-day integrated naturopathy and yoga programme consisting of hydrotherapy, mud therapy, electrotherapy, massage, yoga, pranayama, meditation, dietary modification, counselling and acupuncture. Following the intervention, his neck pain reduced from VAS 6 to 0. Improvements were also observed in HbA1c, total cholesterol, SGPT and SGOT levels, while his alcohol intake reduced from daily consumption to once a week.

Conclusion: The patient showed improvement in cervical pain and several metabolic parameters following the integrated naturopathy and yoga intervention. However, as this is a single case, further studies are needed to determine the effectiveness of this approach.

CASE STUDY

PRELIMINARY DATA

Name: Mr. S

Age: 40 years

Gender: Male

Marital status: Married

Occupation: Internet Service Provider

Religion: Hindu

CHIEF COMPLAINTS

- C/o Severe pain in the neck radiating to the right shoulder and right upper arm since 1 month.

- K/C/o Hypertension since 1 year – Under Medication.
- K/C/o Non-Insulin dependent Diabetes Mellitus since 1 year – Under Medication.
- K/C/o Dyslipidaemia since 1 year.
- K/C/o Chronic alcohol consumption since 10 years.
- K/C/o Hepatomegaly since 5 months.

HISTORY OF CHIEF COMPLAINTS

A patient aged 40 years visited hospital at hulkoti with major complaints of severe neck pain radiating to the right shoulder and right upper arm since 1 month. The pain aggravated while sitting and working with a computer for a prolonged duration and was relieved by rest.

He had a history of Hypertension and Non-insulin-dependent Diabetes Mellitus since 1 year. He was under allopathic medications for hypertension and homeopathic medications since 4 years. The patient has dyslipidemia and also had a history of alcohol addiction since 10 years. Upon investigation, it was found that the patient had hepatomegaly which was found by an ultrasound.

PAST HISTORY

History of gastric lavage after accidental phenol consumption.

SURGICAL HISTORY

No relevant history.

FAMILY HISTORY

No relevant history.

PERSONAL HISTORY

Appetite	Normal
Diet	Non-Veg > Veg (up to 4 times/week)
Thirst	3 – 4 L/ day
Sweat	Normal
Sleep	Good quality sleep
Bowels	Regular
Micturition	Normal Frequency
Habits	Tea (3 cups/ day)
Allergies	None
Addictions	Alcohol consumption (460 ml/day) Smoking (2 cigars/ day)

Table 1: Personal History

VITAL DATA

Blood Pressure	158 / 112 mmHg
Pulse Rate	107 BPM
Respiratory Rate	20 CPM

Height	175 cm
Weight	91 kg
Temperature	Afebrile
BMI	29.7 kg/m ²

Table 2: Vital Data

GENERAL PHYSICAL EXAMINATION

Built	Overweight
Pallor	Absent
Icterus	Absent
Cyanosis	Absent
Clubbing	Absent
Lymphadenopathy	Absent
Oedema	Absent
Skin (appearance)	Normal

Table 3: General Physical Examination

PAIN SCALE



Figure 1: Pain Scale

Pain Scale indicating pain area and pain index:

Region	VAS
Neck and shoulder	6 – 7
Arm	6 – 7

Table 4: Pain Scale

SYSTEMIC EXAMINATION

Cardiovascular system:

Heart sounds (S1 and S2) are heard normally and in rhythm.

Respiratory system:

Thorax is symmetrical and normal chest movements are seen.

Normal vesicular breath sounds are heard.

Gastro-Intestinal System:

No signs of abnormality.

Central Nervous System:

No focal nerve degeneration found.

Musculoskeletal System:

- Gait is normal.
- Decreased range of motion of the neck.
- Pain while flexing the neck.
- Loss of lordosis in the cervical region of the spine.

SYSTEMIC EXAMINATION ACCORDING TO NATUROPATHY:

Facial Diagnosis/ Encumbrance:

Mixed encumbrance: Indicates high levels of toxicity in the body.

Tongue Diagnosis:

A white coating over the tongue is seen indicating the presence of toxins in the body.

Iris Diagnosis:

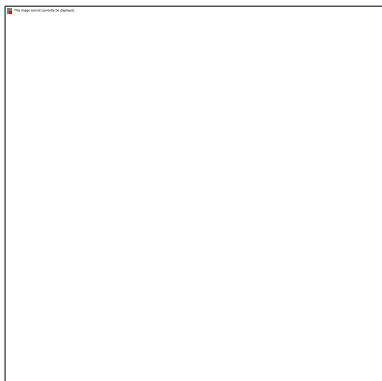
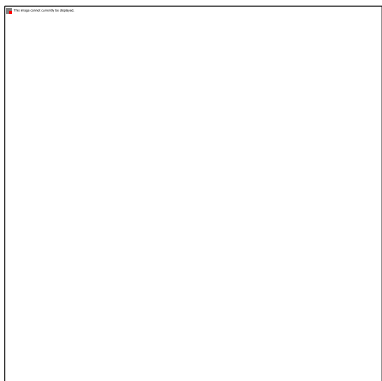
Right Iris	Left Iris
	
• Scurf rim • Nerve rings • Lacune in 3', 5', 7', 9' and 11'o clock	• Scurf rim • Lacune in 12', 2', 4', 8' and 10'o clock

Table 5: Iris Diagnosis

MEDICAL HISTORY

Tab. Telista 20mg (1 – 0 – 0).

Homeopathic medication for DM.

INVESTIGATIONS

1. Blood Test done.

HbA1C	11.8%
FBS	349 mg/dL
Total Cholesterol	298.5 mg/dL
LDL	211.3 mg/dL

VLDL	42.9 mg/dL
Vitamin D3	13.4 ng/dL
Total Bilirubin	1.59 mg/dL
SGPT	236 U/L
SGOT	147 U/L

Table 6: Blood Investigation

2. MRI report.

Cervical disc bulge and nerve compression were found at C5-C6 and C6-C7.

PROVISIONAL DIAGNOSIS

- Diabetes Mellitus
- Hypertension
- Dyslipidaemia
- Metabolic Syndrome
- Cervical Spondylosis
- Brachial plexopathy

FINAL DIAGNOSIS

Metabolic Syndrome and Cervical Spondylosis.

INTRODUCTION

Metabolic Syndrome is a combination of several conditions that can lead to cardiovascular diseases and neurological complications such as cerebrovascular accidents.

Cervical Spondylosis is the degenerative change in the cervical vertebrae that can cause neck pain and may or may not radiate to the arm.

DEFINITION

According to NCEP, **Metabolic syndrome** is present if three or more of the following five criteria are met:

- Wrist circumference over 102 cm (men) or 88 cm (women),
- Blood pressure over 130/85 mmHg,
- Fasting triglyceride (TG) level over 150 mg/dl,
- Fasting HDL level less than 40 mg/dl (men) or 50 mg/dl (women)
- Fasting blood glucose over 110 mg/dl. ¹

Cervical spondylosis is a chronic degenerative process of the cervical spine that affects the vertebral bodies and intervertebral discs of the neck and may progress into disc herniation, bone spur formation, compression of the spinal cord, or cervical spondylotic myelopathy. ²

EPIDEMIOLOGY

Globally more than 25% are likely to have **MetS**. The prevalence is more in women (18%) than in men (9%) globally. In India, the overall prevalence of MetS was approximately found to be 25% which is more

distributed among the urban population. Over the past 3 decades, the prevalence of MetS among the age of >20 years has substantially increased (From 6% to 18%) with the increased prevalence of obesity.^{3, 4} The prevalence of **Cervical Spondylosis** is 23% in the general population. The prevalence is more in women and affects 50% of the population over the age of 40 years and 85% of the population over the age of 60 years. In India, more than 10 million cases per year are seen with more in the urban population owing to the rising trend of a sedentary workstyle.⁵

ETIOLOGY AND RISK FACTORS

The primary cause of **MetS** is said to be Insulin Resistance (IR) which can be caused due to overweight, lack of physical activity, or genetic predisposition. Other risk factors include old age, family history of having MetS or diabetes mellitus, sex (women have a higher risk than men), low socio-economic status leading to an inactive lifestyle and unhealthy diet, and other medical conditions such as PCOS.⁶

In **Cervical Spondylosis**, Age is the major factor in the development of this condition. Other factors include obesity or being overweight, neck injuries, genetic factors, and occupational factors.⁷

TYPES:

Cervical Spondylosis:

- Type I: Cervical Radiculopathy – Confirmed by spurling sign.
- Type II: Cervical Myelopathy – Confirmed by the finger escape and grip-and-release signs.
- Type III: Neck pain radiating toward the head, chest or shoulder area.⁸

PATHOPHYSIOLOGY

Metabolic Syndrome:

Obesity, which is caused due to improper diet and a sedentary lifestyle leads to Insulin Resistance (IR). IR leads to hyperinsulinemia. This leads to lipogenesis and increased hepatic VLDL production. This leads to increased Free Fatty Acid (FFA) production. This increase exceeds the capacity of the adipose tissues to uptake FFA and leads to ectopic fat deposition in the liver and skeletal muscles.⁹ The FFA levels invoke the inflammatory response by secreting cytokines, Tumour Necrotic Factor (TNF), and interleukins. The increased FFA also increases Reactive Oxygen Species (ROS) production, which further hinders insulin action by decreasing adiponectin production and impairing GLUT-4 translocation and gene transcription.^{10, 11}

Obesity and Insulin Resistance can lead to an increased workload on the heart and an increased volume of blood due to the increased mass of the body.¹² This contributes to increased blood pressure. There are also increased circulating levels of VLDL and LDL in the blood which can further increase blood pressure.¹³ Excess fat in the adipocytes leads to decreased secretion of adiponectin and releases various inflammatory substances such as adipokines or TNF that can further interfere with the action of insulin.^{14, 15}

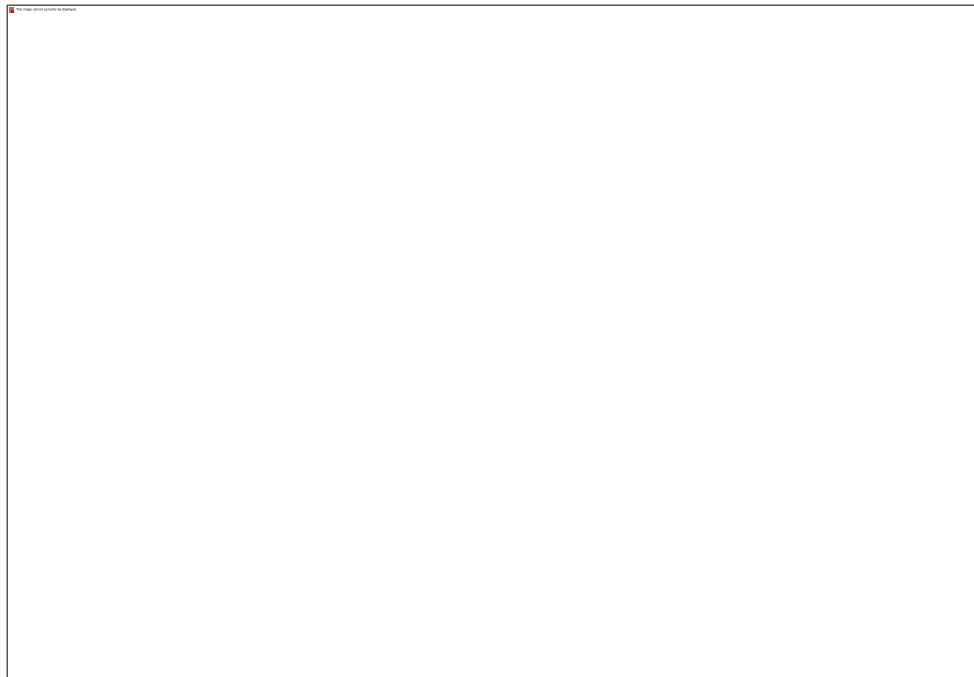


Figure 2: Pathophysiology of Metabolic Syndrome

Cervical Spondylosis:

CS is caused due to degeneration of the intervertebral discs which is because of biochemical changes during aging. Repeated occupational stress can also cause such degenerative changes. This can lead to the formation of bone spurs. It might also be congenital bone anomalies. This can cause symptomatic spinal cord compression, leading to disc herniation and myelopathy. Further, the decrease in intervertebral space causes nerve root compression leading to radiculopathy. This causes the feeling of numbness and pain while flexion or extension of the neck.^{16, 17}

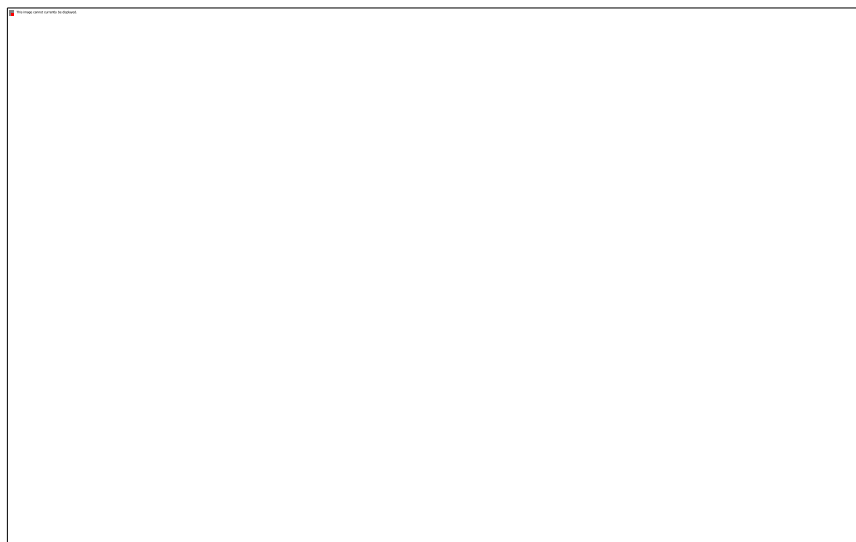


Figure 3: Pathophysiology of CS

CLINICAL FEATURES

Metabolic Syndrome:

- Central obesity

- High blood pressure
- High Tg and cholesterol levels
- High blood glucose levels
- Low HDL levels

Cervical Spondylosis:

- Neck pain and stiffness
- Headaches
- Radiculopathy
- Cervical Myelopathy
- Trouble balancing
- Inability to control the bladder or bowel

DIFFERENTIAL DIAGNOSIS***Metabolic Syndrome:***

- Hypothyroidism
- Hypertension
- Dyslipidaemia
- Type 2 DM
- Pheochromocytomas

Cervical Spondylosis:

- Cervical sprain or strain
- Cervical fracture
- Adhesive capsulitis
- Multiple sclerosis
- Carpal tunnel syndrome
- Brachial plexopathy
- Osteomyelitis

DIAGNOSIS

Metabolic Syndrome with Cervical Spondylosis

NATUROPATHIC UNDERSTANDING

According to Naturopathy, the main cause of the disease is the violation of Nature's law through an unhealthy lifestyle. Ennervation, Nutrition, and Drainage get impaired which leads to the accumulation of morbid matter resulting in disease formation.¹⁸



Figure 4: Naturopathic Understanding

AIMS AND OBJECTIVES

- To improve vitality and promote the elimination of morbid matter by regulating lifestyle.
- To reduce inflammation and oxidative stress.
- To increase insulin sensitivity.
- To decrease cholesterol and triglyceride levels.
- To control blood pressure.

CONVENTIONAL MANAGEMENT

Metabolic Syndrome management focuses on treating the conditions and correcting the risk factor. A change in diet and exercise are emphasized for Metabolic Syndrome.

Drug	Action
Hypertension	

Diuretics	Promotes sodium and water elimination and decreases blood volume.
Angiotensin Converting Enzyme (ACE) Inhibitors	Prevents formation of Angiotensin II.
Angiotensin II Receptor Blocker (ARB)	Blocks the binding of Angiotensin II to the receptor and thus preventing vasoconstriction.
Calcium Channel Blockers	Prevents calcium uptake into the cells and relaxes the vessel wall.
Vasodilators	Vasodilators such as Nitrous Oxide act directly on the vessel wall and are used in hypertensive emergencies.
α , β and $\alpha+\beta$ Blockers	They block the adrenergic receptors causing vasodilation and lowering heart rate.
Diabetes Mellitus	
Metformin	Delays glucose absorption, inhibits hepatic glucose production, and increases peripheral glucose sensitivity.
Sulfonylureas	Promotes the release of Insulin from beta cells of the pancreas.
DPP4 Inhibitors	Prevents incretin breakdown which leads to insulin secretion and release.
SGLT2 Inhibitors	Reduces glucose reabsorption and promotes excretion in urine.
Thiazolidinediones	Improves insulin sensitivity in the adipose tissues and skeletal muscles.
Alpha-glucosidase inhibitors	Delays carbohydrates breakdown and digestion.
GLP-1 receptor agonists	Mimics the action of Insulin.
Dyslipidaemia	
Statins	Inhibits HMG-CoA and decreases cholesterol production in the liver.
Bile Acid Sequestrants	Binds with bile acids and prevents bile reabsorption.
Fibrates	Promotes the breakdown of triglycerides.
Ezetimibe	Inhibits cholesterol absorption from the small intestines.

Table 7: Conventional Management

Cervical Spondylosis:

Non-surgical approaches include the use of NSAIDs along with muscle relaxants and steroids. Cervical collar and traction along with physiotherapy are also helpful.

Surgical approaches include fusing the spine with autografts, allografts, or artificial intervertebral discs used with plates, cages, and spacers to ensure better results.¹⁹

TREATMENT ACCORDING TO NATUROPATHY

A. OPD Protocol:

Day	Treatments	Duration
1st	– HSF to neck, shoulder, and back	10 minutes
	– Acupressure to neck, shoulder, and back	10 minutes
	– Mud pack to the abdomen and eyes	20 minutes
2nd	– Mud pack to the abdomen and eyes	20 minutes
	– Partial massage to the neck, shoulder, and back	10 minutes
	– HSF to neck, shoulder, and back	

		10 minutes
3rd	– Mud pack to the abdomen and eyes – Partial massage to the neck, shoulder, and back – HSF to neck, shoulder, and back	20 minutes 10 minutes 10 minutes
4th	– Partial massage to the neck, shoulder, and back – HSF to neck, shoulder, and back – IFT to neck and upper back	10 minutes 10 minutes 10 minutes
5th	– Neutral water enema – Cold underwater massage – IFT to neck and upper back	30 minutes 10 minutes
6th	– Alternate fomentation to lower neck and upper back – IFT to neck and upper back – Acupressure to back	10 minutes 10 minutes 10 minutes
7th	– Mud pack to the abdomen and eyes – HSF to full back and hips – IFT to upper back	20 minutes 10 minutes 10 minutes
8th	– Partial massage to the neck, shoulder, and back – HSF to neck, shoulder, and back – IFT to neck and upper back	10 minutes 10 minutes 10 minutes
9th	– Full mud bath – Acupressure to feet and palm	45 minutes 10 minutes
10th	– Cold fomentation to C7 and C8 region – US to C7 and C8 region – Mud pack to the abdomen and eyes	10 minutes 10 minutes 20 minutes
11th	– Partial massage to the neck, shoulder, and back – HSF to legs and hips – Mud pack to the abdomen and eyes	10 minutes 10 minutes 20 minutes
12th	– Partial massage to the neck, shoulder, and back – HSF to legs and hips – Mud pack to the abdomen and eyes	10 minutes 10 minutes 20 minutes
13th	– Mud pack to the abdomen and eyes – Mustard pack to spine – Neutral hip bath	20 minutes 15 minutes 10 minutes
14th	– Full mud bath	45 minutes
15th	– Cold spinal spray	10 minutes 10 minutes

	– Acupressure to back – Mud pack to the abdomen and eyes	10 minutes
16th	– Cold underwater massage	20 minutes
17th	– Partial massage to the neck, shoulders, and the back	10 minutes
	– Mustard pack to right shoulder and upper back	15 minutes
	– Steam bath with neutral chest pack	10 minutes
18th	– Partial massage to the neck, shoulders, and the back	10 minutes
	– HSF to the neck, shoulders, and the back	10 minutes
	– Mud pack to the abdomen and eyes	20 minutes
19th	– Oil + HSF to the neck, shoulders, and the back	10 minutes
	– Sauna Bath	15 minutes
20th	– VM to back and legs	10 minutes
	– Neutral hip bath	10 minutes
	– Cold leg pack with epsom salt	20 minutes
21st	– Full mud bath	45 minutes
	– Acupressure to feet	10 minutes
22nd	– HSF + Oil to the neck, shoulders, and the back	10 minutes
	– Acupressure to the neck and shoulders	10 minutes
	– Neutral spinal spray	10 minutes
23rd	– Partial massage to the lower back	10 minutes
	– IRR to the back and legs	10 minutes
	– IFT to lower back	10 minutes
24th	– Partial massage to the lower back	10 minutes
	– IFT to the lower back	10 minutes
	– Neutral spinal spray	10 minutes
25th	– Full body massage	45 minutes
26th	– Partial massage to the neck and back	10 minutes
	– Mustard pack to the neck and upper back	10 minutes
27th	– HSF + oil to the neck, shoulder, and back	10 minutes
	– US to the right shoulder	10 minutes

Table 8: OPD Protocol

B. Yoga Protocol:

Phase	Practice	Duration	Mechanism
Centering	Diaphragmatic breathing	3–5 min	Enhances parasympathetic

			activity and relaxation , helping reduce stress-related muscle tension and pain in cervical spondylosis and also beneficial in hypertension and metabolic syndrome.
Loosening	Shoulder movements	2 min	Mobilizes shoulder girdle and reduces upper-trapezius stiffness
	Scapular retraction	2 min	Strengthens rhomboids/middle trapezius and improves scapular position
	Gentle cervical movements	3 min	Maintains ROM and reduces stiffness
Asana	Tadasana	2 min	Promotes neutral head/neck alignment and postural awareness
	Marjariasana–Bitilasana	2 min	Produces controlled spinal flexion/extension and reduces spinal stiffness
	Bhujangasana – mild version	2 min	Strengthens spinal extensors and promotes thoracic extension

	Shalabhasana – mild version	2 min	Strengthens back and scapular stabilizers
	Setu Bandhasana	2 min	Strengthens posterior chain and improves trunk stability
	Vakrasana – gentle	2 min	Promotes gentle spinal and trunk mobility , helping reduce stiffness and improve postural control without excessive cervical strain.
	Ardha Matsyendrasana – gentle	2 min	Improves spinal mobility and postural flexibility , reducing stiffness and muscular tension associated with cervical spondylosis.
Relaxation	Makarasana	3 min	Reduces paraspinal muscle tension and promotes relaxation
Pranayama	Nadi Shodhana	5–7 min	Improves autonomic balance, helping reduce BP and stress and support metabolic regulation.
	Bhramari	5 min	Promotes relaxation and parasympathetic activity, reducing muscle tension and pain in cervical spondylosis and also supports blood pressure regulation in hypertension

Relaxation	Shavasana	5–7 min	Reduces sympathetic arousal and muscle guarding
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Table 9: Yoga Protocol

C. Home protocol is given for the following:

Days	Time	Diet Protocol
1 st day to 12 th day	After waking up	Luke warm water + Turmeric powder
	11 AM	2 Fruits (Apples)
	Noon	Palak soup + Vegetable Salad
	Evening / Dinner	1 Juice (ABC / Green)
12 th day to 20 th day	Alternate day fasting (36 hours)	Water Fasting. Coconut water if felt hungry.
20 th day to 27 th day	After waking up	Luke warm water + Turmeric powder
	11 AM	2 Fruits (Apples)
	Noon	Palak soup + Vegetable Salad
	Evening / Dinner	1 Juice (ABC / Green)

Table 10: Diet Protocol

Note: The patient had consumed alcohol occasionally (comparatively lesser amount than previous) due to changes in sleep patterns during the course of diet and fasting.

D. Counselling:

The patient was educated and counselled about alcohol addiction. He was advised with different techniques to deal with his urge to drink alcohol and to avoid the thought of consuming alcohol. The pattern of alcohol consumption reduced from daily drinking habits to once a week. Further, the patient was advised to engage in activities like yoga, meditation, and walking.

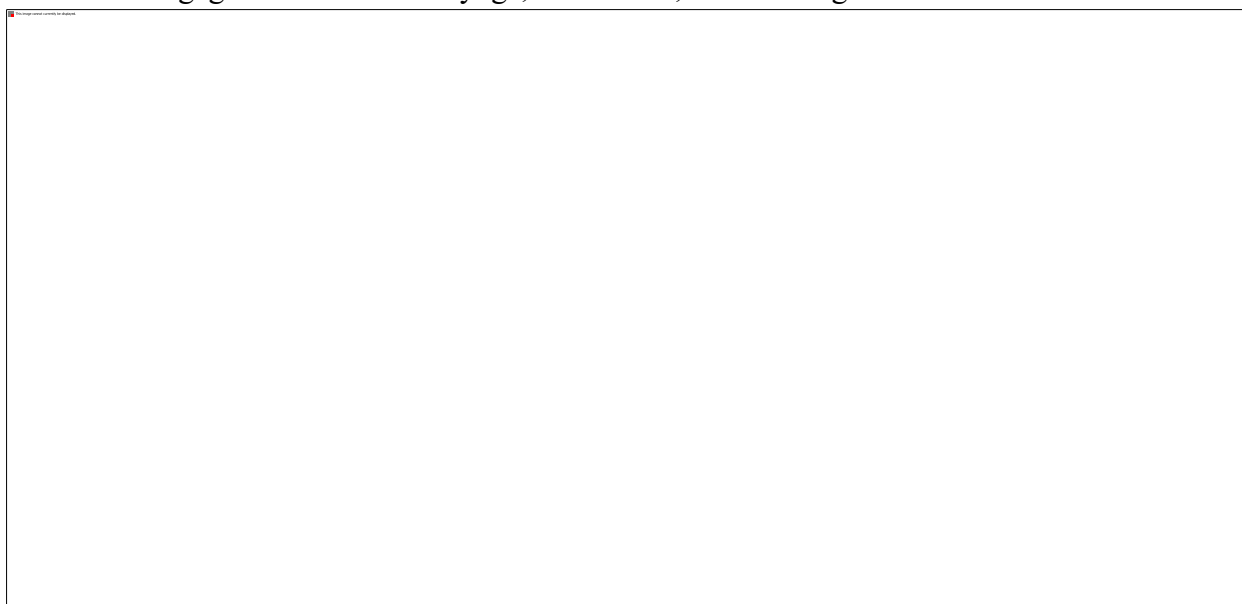


Figure 5: Counselling

E. Acupuncture:

The patient was given acupuncture to aid in alcohol deaddiction. The points given to the patient in the 5 days of acupuncture include bilateral points:

- Heart 7
- Stomach 36
- Spleen 6.

NATUROPATHIC TREATMENT RATIONALE**Mud Pack and Bath:**

Duration: 20 to 30 minutes.

Effects: Mud Therapy can relax the surface vessels and draws blood to the surface by the dilation of the blood vessels and also helps in relieving congestion and pain. The tactile receptors on the skin are stimulated and reduce the prostaglandin levels, thereby reducing inflammation.^{20,21, 22}

Feedback: The patient felt relaxed and cool after the treatment.

Hot Sand Fomentation:

Temperature: 39° to 40° C.

Duration: 10 minutes.

Effects: Hot Sand Fomentation gives an analgesic effect by working on the skin's thermoreceptors, reducing inflammation and promoting healing by the vasodilatory effect.^{23, 24}

Feedback: The patient felt a reduction in pain in the shoulder and neck region.

Partial Massage:

Duration: 10 minutes.

Effects: Massage can help in reducing the pain and stiffness in the body by improving circulation, the release of serotonin, and possibly through gate control action. It also improves the range of motion.^{25, 26}

Feedback: The patient was relaxed and the pain was reduced.

Acupressure:

Duration: 10 minutes.

Effects: Acupressure can balance the energy flow to various organs and can provide pain relief and relaxing effects on the body. It's said to work on the gate control theory. It's also found to have effects on type 2 DM.^{27, 28}

Feedback: The patient felt pain at first but later felt rejuvenated.

Interferential Therapy:

Duration: 10 minutes

Effects: Interferential Therapy (IFT) works by passing current through the electrodes, works on the nerves by stimulating them, and acts based on the pain gate theory.²⁹

Feedback: The pain in the neck and shoulder was reduced after this treatment.

Mustard Pack:

Duration: 10 minutes

Effects: Mustard is said to have anti-inflammatory properties. The Mustard pack is said to have a counter-irritant effect on the body thereby relieving the pain on the area applied.^{30,31, 32}

Feedback: The patient had felt a slight burning sensation, but his neck and back pain was reduced.

Acupuncture:

The three points *Zusanli* (ST36), *Sanyinjiao* (Sp6), and *Shenmen* (H7) are said to have the ability to modu-

late the mesolimbic release of dopamine and suppress the urge to consume alcohol.³³

Yoga:

The integrated yoga protocol was designed to improve cervical mobility, postural alignment, muscular strength, relaxation and autonomic regulation, while regular physical activity and pranayama may provide supportive benefits for cardiometabolic risk factors associated with metabolic syndrome.^{34, 35}

PROGNOSIS

After the treatment of 27 days, the patient had changes in various parameters.

Parameters	Pre-treatment	Post-treatment
VAS of neck pain	6	0
Pattern of Alcohol intake	Daily	Once a week
HbA1C	11.8 %	10.2%
Total cholesterol	298.5 mg/dL	258.8 mg/dL
SGPT	249 U/L	126 U/L
SGOT	147 U/L	116.5 U/L

Table 10: Prognosis

Notable changes were also seen in his Iris. There are reduced crypts and lacune. Changes in blood glucose levels and blood pressure are also seen.

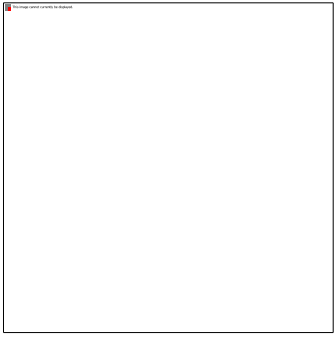
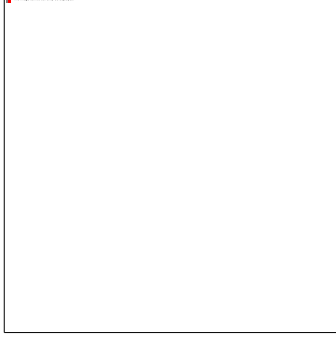
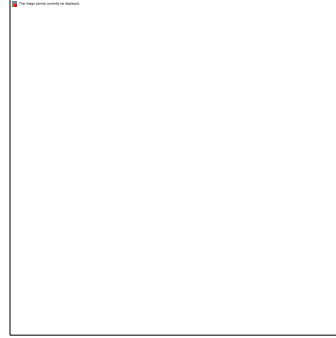
Left Iris (Before)	Left Iris (After)
	
Right Iris (Before)	Right Iris (After)
	

Table 11: Iris Prognosis

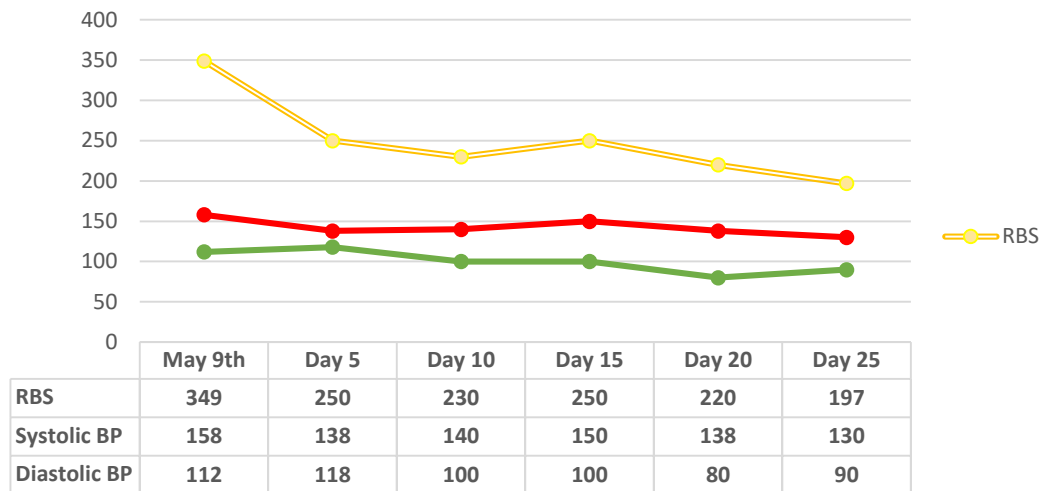


Figure 6: Prognosis Graph

CONCLUSION

The patient underwent 27 days of Naturopathy and Yogic interventions like Hydrotherapy, Mud therapy, Electrotherapy, Exercise therapy, Meditation, and Acupuncture. He had significant changes in Visual Analogue Scale (VAS), blood glucose level, blood pressure, HbA1C, SGOT, SGPT, total cholesterol and BMI along with changes in the pattern of alcohol intake. The patient experienced relief from pain and his symptoms and he was advised for regular follow-up to manage his condition. This may be attributed to a holistic approach through Naturopathy and Yogic treatments.

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