Management of Chronic Hypertension and Metabolic Dysfunction through a Root-Cause-Based Functional Nutrition Intervention: A Case Study

Abstract

The case study explores the clinical outcomes of a 38-year-old man based in Maharashtra, India, with chronic hypertension, metabolic dysfunction, and grade II obesity. Generally, conventional treatment for hypertension focuses on long-term medication to alleviate high blood pressure. However, in this study, a functional nutrition framework was employed in order to find and work on the underlying issues, such as infection and inflammation, insulin resistance, and oxidative stress. Over a period of time, the subject followed a personalized nutrition plan that included the elimination of inflammatory foods, targeted micronutrient supplements including Magnesium, CoQ10, and stress-reduction techniques, such as mindfulness meditation. The results exhibited a complete normalization of blood pressure, a significant drop in resting heart rate from over 100 beats/minute to below 70 beats/minute, and the successful cessation of antihypertensive medication (Olmezest H 40). Furthermore, the subject was able to lose body weight from 114 kg to 91 kg and also showed remarkable improvement in hepatic enzymes. In short, this case study highlights the effectiveness of tackling physiological root causes to restore cardiovascular health, and also outlines the potential of functional nutrition as a primary or adjunctive treatment for patients with chronic hypertension.

Key Words: Hypertension, Olmezest H 40, Functional nutrition, Cardiovascular health

I. Introduction

The current study introduces the clinical journey of a 38-year-old man who was suffering from weight management issues, cardiovascular concerns and digestive dysfunction for a long time. Although physical activity was a part of his daily routine, he struggled with high blood pressure and an elevated heart rate that consistently remained above 100 beats/minute (a marker of an overstressed cardiovascular system) throughout the day. Additionally, he suffered from persistent constipation and low energy levels that impacted his life. In short, he was physically active but metabolically unwell. Before seeking a functional nutrition intervention, his primary health challenge was chronic hypertension along with other secondary concerns. Hence, he approached iThrive with a main objective to bring his blood pressure to normal, reduce his weight and minimize his dependence on a system that couldn't maintain homeostasis. iThrive's Root Cause Analysis revealed a complex interplay of metabolic issues, defining fatty liver, insulin resistance, oxidative stress and chronic inflammation as key drivers behind his hypertension. Identifying these core findings made it crystal clear that the patient's high blood pressure was actually a protective response against internal health dysfunction. This report highlights how a customized protocol based on structured functional nutrition and lifestyle intervention successfully normalized his blood pressure, lowered his resting heart rate to below 70 beats/minute, and resulted in a 23 kg weight loss, underlining that health is deeply rooted in metabolic balance.

II. Subject Information

Gender: Male
Age: 38 years
Occupation & Mode of Work: Office-based, Hybrid
Location: Panvel, Maharashtra, India

III. Objectives

Primary health goals:

- To bring down his blood pressure to normal
- To improve his weight issues
- To work on his digestive concerns

Secondary health goals:

- To improve his energy levels
- To improve his blood markers
- To improve his food choices
- To work on his mental health

IV. Health Challenges of the Subject

Hypertension

Hypertension refers to having high blood pressure, generally ≥130/80 mmHg, which poses as one of the major modifiable concomitant risks for cardiovascular diseases (CVDs) and metabolic dysfunctions. Moreover, several metabolic risk factors can directly cause vascular dysfunction and high blood pressure. Hypertension is correctly called the “silent killer” since people usually exhibit no symptoms of an elevated blood pressure until incidents like cardiac arrest or stroke occur. Hypertension is mainly divided into:

(a) Primary Hypertension- It does not have a known cause, often attributed to environmental or genetic factors. The associated risk factors of the same include age, obesity, family history, diet and lifestyle.

(b) Secondary Hypertension- It has an underlying medical cause and may coexist with risk factors linked to primary hypertension. Significant causes for secondary hypertension can be related to prescription medications, over-the-counter medications and other health conditions.

On the basis of blood pressure readings, hypertension can be categorized into:

- **Normal:** Systolic less than 130 and Diastolic less than 85 mm Hg;
- **High-Normal:** Systolic 130 to 139 and Diastolic between 85-89 mm Hg;
- **Grade 1 Hypertension:** Systolic 140 to 159 or Diastolic 90 to 99 mm Hg;
- **Grade 2 Hypertension:** Systolic greater than or equal to 160 mm Hg or Diastolic greater than or equal to 100 mm Hg.

Obesity

Obesity is a complex, multifactorial health condition that is a consequence of chronic positive energy balance. The World Health Organization (WHO) defines “globesity” as a global epidemic of obesity that is increasing rapidly. The diseases that are known to occur due to obesity are also on the rise, particularly hypertension, CVDs and type II diabetes mellitus. It is also hypothesized that among individuals with the same body weight, those who possess higher blood pressure levels tend to gain more weight over time. In people having a risk of developing hypertension, an overactive nervous system can interfere with the regulation of β-adrenergic receptors, resulting in an attenuated thermogenic response and an increase in the inclination to store fat and gain weight.

Digestive Concerns

The gastrointestinal (GI) tract is a critical organ involved in metabolic hypertension. Enterogenous factors such as gut bacteria, GI hormones, liver insulin sensitivity, and GI nerve innervation, as well as dietary components, contribute to blood pressure regulation. Furthermore, digestive issues like constipation (that the patient faced) are also linked to a higher risk of hypertension and cardiovascular concerns in people aged 60 years and above. Both bowel movement and blood pressure fluctuation are significantly regulated by the autonomic nervous system. The correlation between constipation and increased blood pressure variability could be a sign of autonomic dysfunction involving the gut-vascular axis.

V. Timeline of Medical History, Diagnosis, and Key Interventions & Protocol Adjustments

The clinical timeline for the health restoration journey of the subject marks a shift from drug suppression to natural healing. It can be explained briefly in three stages:

(a) The State of Alarm (November 2022)

In the beginning, the body was in a high-pressure survival mode. The diagnosis of chronic hypertension and tachycardia reflected the body's reaction to extreme internal stress. The lab results showed high GGT (55.9) and ALT (80.5), signaling that the liver was having trouble dealing with oxidative stress. Due to inflammation in the liver and metabolic systems, the heart had to pump harder and faster. The maximum dose of Olmezest H 40 mg was required to keep blood pressure stable.

(b) The Reprogramming Phase (2023 – 2024)

This was the major part of the timeline, where the iThrive protocol removed the triggers for high blood pressure. By adding high-dose Magnesium, the protocol supplied the body with what it needed to relax the arterial walls. As the weight dropped from 114 kg to 91 kg, the volume load on the heart lessened. The drop in fasting insulin helped the kidneys stop holding onto extra salt, which naturally reduced the pressure. The GGT levels began to decrease to 23.7 IU/L, showing that the systemic inflammation was being put out.

(c) Clinical Resolution and Maintenance (2025)

The final stage of the timeline shows the body achieving a new "Set Point" of health. With the main issues addressed, Olmezest H 40 was no longer needed. The body maintained blood pressure at a stable level. The heart rate was below 70 beats per minute, showing that the nervous system had shifted from "fight-or-flight" to a state of recovery and strength.

In short, the timeline indicates that the disease was not a permanent condition but a temporary state of imbalance that fully resolved once the biological "brakes" (nutrients

and liver health) were applied and the "accelerants" (sugar, seed oils, and stress) were removed.

Given below is a table citing elaborate information about the journey of the subject with iThrive from the year 2022-2025:

Phase/Period	Clinical Status & Diagnosis	Key Interventions & Protocol Adjustments
Pre-Intervention (Early 2022)	Diagnosis: Chronic hypertension, Grade II Obesity, Tachycardia.	Pharmacological: Commenced Olmezest H 40. Reported low energy and chronic constipation.
Baseline/RCA (Nov 2022)	Status: Weight: 114 kg; RHR: >100 beats/minute; GGT: 55.9 IU/L (High Oxidative Stress).	RCA Conducted: Identified insulin resistance, gut dysbiosis, and micronutrient deficiencies (Mg, Zn, vitamin D3).
Initiation (Dec 2022 – Feb 2023)	Status: Rapid initial weight loss; beginning of BP stabilization.	Nutrition: Elimination of Gluten, Dairy, and Seed Oils. Transition to High-Protein/Millets. Started Magnesium Bisglycinate.
Detoxification (Mar 2023 – June 2023)	Diagnostic Update: Liver enzymes showing downward trend.	Detox: 9-Day Intensive Hepatic Flush. Implementation of Binders (Activated Charcoal) and Castor Oil packs.
Reprogramming (July 2023 – Dec 2023)	Status: Significant reduction in medication side effects; improved sleep.	Nutraceuticals: Added Berberine, CoQ10, and Vitamin D3+K2. Incorporation of functional training.
Consolidation (Jan 2024 – June 2024)	Status: Weight reached ~95 kg. RHR stabilized between 70–80 beats/minute.	Circadian Reset: Strict 10 PM sleep window. Blue light mitigation. Supervised tapering of Olmezest H 40.

Maintenance (July 2024 – July 2025)	Continued with maintaining good health for a sustainable life	Maintenance: Medication-free status achieved. Adherence to whole-food nutrition and consistent meditation/breathwork.

Table 1: Timeline of Medical History, Diagnosis, and Key Interventions & Protocol Adjustments

VI. Parameters Considered for the Subject

(a) Diabetes and Glycemic Control

These markers assess how the body processes glucose and how sensitive it is to insulin.

Fasting Blood Sugar

Fasting Blood Sugar measures the concentration of glucose in the blood after 12-hour fast. It is a main indicator of the body's ability to keep blood glucose level stable. It shows the body's baseline glycemic state, which is mainly controlled by the liver's production of glucose through gluconeogenesis and glycogenolysis, along with the pancreas' basic secretion of insulin. This test is the standard way to diagnose pre-diabetes and Type 2 Diabetes Mellitus.

HbA1c (Glycated Hemoglobin)

It measures the percentage of hemoglobin, which is the protein in red blood cells that carries oxygen, with glucose molecules attached. This process is known as non-enzymatic glycation. Since red blood cells live for about 120 days, the HbA1c test shows the average blood glucose levels over the last eight to twelve weeks.

Fasting Serum Insulin

Fasting Serum Insulin measures the amount of the hormone insulin in the blood after a person has fasted for at least 10 to 12 hours. When fasting, the body uses a basic level of insulin to control glucose production in the liver, preventing it from releasing too much sugar. It also helps with fatty acid metabolism. Glucose levels show the fuel level, while insulin levels indicate how much effort the pancreas is putting in to manage that fuel

Triglyceride/HDL Ratio

Triglyceride/HDL Ratio is calculated by dividing the total concentration of triglycerides by the concentration of high-density lipoprotein (HDL) cholesterol. Triglycerides are the main form of stored energy, or fats, in the blood. HDL is responsible for reverse cholesterol transport, which means it carries excess fats away from the arteries and back to the liver.

Parameter	Optimal Range	Unit	Patient value	Possible Root Cause
Fasting Blood Sugar	82-88	mg/dl	89.15	Insulin Resistance
HbA1c	5-5.3	%	5.6	
Fasting Serum Insulin	<5	µIU/ml	33.2	
Triglyceride/HDL Ratio	<3.8	Calculation	3.23	Increased risk of cardiovascular disease

Table 2: Parameters for Diabetes and Glycemic Control

(b) Infection and Inflammation

The following markers monitor the activity of the immune system and the presence of stress in the body.

Absolute Neutrophils

Absolute Neutrophil Count measures the actual number of neutrophils, the most common type of white blood cell (WBC), in a microliter of blood. Neutrophils are granulocytes with a multi-lobed nucleus and are the main "first responders" of the innate immune system. This measurement is a better clinical marker than just the neutrophil percentage because it gives the exact volume of the body's immediate defence against infections. High levels of the same, or neutrophilia, usually indicate an acute response to bacterial infections, physiological stress, or systemic inflammation. Low levels, or neutropenia, suggest an exhausted immune system or bone marrow suppression.

Relative lymphocytes

Relative lymphocytes define the percentage of lymphocytes, which are one of the two main types of agranulocytic WBCs, within the total WBC count. Lymphocytes are key players in the adaptive immune system. They have a large, dense, spherical nucleus that takes up most of the cell's volume, leaving a thin edge of pale blue cytoplasm.

While the bone marrow produces all lymphocytes, they mature and are trained in lymphoid organs like the thymus, spleen, and lymph nodes. The "relative" measurement indicates how much of the immune system is focused on specialized, antigen-specific defence. Lymphocytes are mainly divided into three major groups:
B-Lymphocytes (B-cells): They are responsible for humoral immunity by producing specific antibodies (immunoglobulins) that neutralize pathogens.
T-Lymphocytes (T-cells): They handle cell-mediated immunity. This includes helper T-cells that coordinate the immune response and cytotoxic T-cells that directly kill virally infected or cancerous cells.
Natural Killer (NK) Cells: They are part of the innate-like response that offers quick defence against tumor cells and intracellular pathogens.

Relative Eosinophils
Relative Eosinophils is the percentage of eosinophils, a specialized type of granular WBC, in the total WBC differential count. These cells are important for the innate immune system. They have large granules in their cytoplasm that give a distinct orange-red colour when stained with eosin dye. Eosinophils are produced in the bone marrow and circulate in the blood briefly before moving into tissues, especially those in contact with the outside world, like the respiratory tract, gut, and skin. The relative measurement gives a proportional view of the immune system's focus. Eosinophils are specifically designed to deal with large, multicellular pathogens that other cells cannot engulf, such as parasitic worms. They also play a complex, sometimes harmful role in managing allergic responses and influencing the actions of other immune cells.

High-Sensitivity C-Reactive Protein (hs-CRP)
hs-CRP is a precise measurement of an acute-phase protein made by the liver in response to pro-inflammatory cytokines, particularly IL-6. Standard CRP tests detect significant inflammation during acute injuries or severe infections, while the high-sensitivity assay uses laser-based nephelometry to find small, sub-clinical amounts of CRP in the blood. Scientifically, hs-CRP acts as a marker of chronic low-grade inflammation. It assesses inflammation in the vascular endothelium. Since chronic inflammation is a major factor in arterial plaque instability and metabolic issues, hs-CRP is an important tool for predicting cardiovascular risk in patients who may otherwise appear healthy.

Platelet Count
The Platelet Count measures the number of platelets per microliter of blood. Platelets are not complete cells; they are small, disc-shaped fragments derived from megakaryocytes in the bone marrow. Their main function is to maintain hemostasis through a three-step process: they adhere to damaged vessel walls, activate and

change shape, and aggregate to form a plug. Beyond clotting, platelets contain alpha-granules and dense granules loaded with growth factors and inflammatory substances. Therefore, a platelet count reveals more than just bleeding risk; it also reflects the body's ability to regenerate and its level of inflammation. High counts, or thrombocytosis, can point to chronic bone marrow stimulation or hidden inflammation, while low counts, or thrombocytopenia, may indicate immune destruction or nutritional deficiencies.

Parameter	Optimal Range	Unit	Patient value	Possible Root Cause
Absolute Neutrophils	< 3.25	10E3/uL	5.63	Infection & inflammation
Relative Lymphocytes	30-35	%	35.3	Viral Infection
Relative Eosinophils	<3	%	4.5	Allergies/Infection/ Tapeworm
hs-CRP	<1, ideally under 0.5	mg/l	6.3	Infection & inflammation
Platelet Count	225-275	10E3/mm3	385	Stress, Viral infection

Table 3: Parameters for Infection and Inflammation

(c) Liver Panel

The following health parameters help to evaluate hepatic health of an individual:

Fatty Liver Index

Fatty Liver Index estimates the presence of fatty liver (steatic hepatosis) based on triglycerides, GGT, BMI, and waist circumference without involving any invasive method. It is an affordable alternative to costly imaging or liver biopsies. Generally, a score < 30 rules out fatty liver, while a score of > 60 suggests a probability of developing hepatic steatosis. As fatty liver is known to contribute to insulin resistance, this measure is very helpful to pinpoint the metabolic causes of vascular and hypertensive diseases.

ALT (Alanine Aminotransferase)

ALT, an enzyme present in hepatocytes, helps in the glucose-alanine cycle by moving an amino group from alanine to α-ketoglutarate, generating pyruvate and glutamate. While it is present in low concentration in blood, an elevated serum ALT strongly defines liver cell injury. ALT is one of the most important biomarkers used to monitor hepatic inflammation and judge the effectiveness of the treatment for the same.

AST (Aspartate Aminotransferase)

AST is one of the primary enzymes that is found in the liver. It is a pyridoxal phosphate-dependent enzyme that plays a vital role in amino acid metabolism by catalyzing the reversible transfer of an α-amino group between aspartate and glutamate. Unlike ALT, which is only specific to the liver, AST can also be found in many other metabolically active tissues, including the heart, skeletal muscle, kidneys, and RBCs. AST is measured alongside ALT to calculate the AST/ALT ratio that provides valuable diagnostic information. For instance, if AST > ALT, it may indicate alcoholic liver disease or muscle injury. Conversely, if ALT > AST, it usually points to non-alcoholic fatty liver disease (NAFLD).

GGT (Gamma Glutamyl Transpeptidase)

This is a membrane-bound enzyme that supports the gamma-glutamyl cycle to produce, breakdown and transport glutathione. GGT is majorly found in the cell membranes of tissues involved in absorption and secretion, including the biliary tract. GGT is a very sensitive biomarker for bile flow obstruction, also known as cholestasis in medical terminology, and alcohol consumption. Additionally, higher levels of GGT are popularly recognized as a sign of oxidative stress as well as inflammation. Besides, elevated GGT level is also metabolic syndrome and cardiovascular events.

Albumin/Globulin Ratio

This ratio is calculated from the total protein level in the blood that depicts the balance of albumin to globulins. Albumin is a protein prepared by the liver, that aids in maintaining osmotic pressure and transporting hormones. Globulins are a diverse group of proteins, including immunoglobulins and acute-phase reactants produced by the immune system. An elevated albumin/globulin ratio generally indicates good liver function and low systemic inflammation. A low albumin/globulin ratio, with high globulins and low albumin indicates liver dysfunction either due to cirrhosis, chronic inflammation or an enhanced immune response due to chronic infection or autoimmune disease. In this case study, this ratio shows the relationship between the body’s nutritional state (Albumin) and its immune/inflammatory status (Globulins).

Parameter	Optimal Range	Unit	Patient value	Possible Root Cause
Fatty Liver Index	<30 Less than 30 rules out Fatty Liver	Calculation	90	Insulin Resistance Oxidative Stress/ Inflammation/ Toxin exposure
ALT	13-22	IU/L	80.5	Liver Dysfunction
AST	12-26	IU/L	45.4	Liver Dysfunction/ Alcohol Consumption
GGT	12-24	IU/L	55.9	Alcohol intake/ Oxidative Stress
Albumin/Globulin Ratio	1.8-2		1.18	Liver Dysfunction/Chronic inflammation/Infection

Table 4: Parameters for Hepatic Health

(d) Kidney Health

Creatinine

It is a nitrogenous organic acid and a by-product of creatine phosphate, which is a high-energy molecule mainly found in skeletal muscle. In the human body, creatine is converted to creatinine at a fairly steady rate, about 1% to 2% of total muscle creatine each day. Once created, creatinine enters the bloodstream and travels to the kidneys. Creatinine is the most commonly used internal marker for checking kidney filtration ability. Since it is freely filtered by the glomerulus, the kidney's tiny filtering unit, and is neither reabsorbed nor significantly secreted by the renal tubules, the concentration of creatinine in the serum reflects the Glomerular Filtration Rate (GFR) in a reverse manner. The optical range for the same is around 0.8 to 1.1 mg/dL. Higher levels of creatinine mean a decrease in the kidneys' ability in clearing waste material. In a patient with high blood pressure, even a reading that is "high-normal" can suggest the early stages of hypertensive kidney disease. Low creatinine, on the other hand, often refers

to low muscle mass, malnutrition, protein deficiency, or serious liver disease, rather than good kidney health.

Blood Urea Nitrogen (BUN)

It is a measure of nitrogen in the blood that comes from urea. Urea is a waste product made in the liver during the urea cycle. This biochemical process turns toxic ammonia, which is a by-product of breaking down proteins, into a water-soluble compound that can safely travel in the blood. After the liver produces urea, it enters the bloodstream and is mainly removed by the kidneys through glomerular filtration. Therefore, BUN is a sensitive marker of the balance between protein breakdown and kidney clearance. For patients with high blood pressure, increased BUN can indicate renal stress. Poorly controlled blood pressure or overusing diuretics, which are common blood pressure medications, can reduce blood flow to the kidneys. This causes the kidneys to reabsorb urea into the blood to retain water, leading to a rise in BUN.

Osmolarity

It is a measurement that determines the concentration of all solute particles, such as sodium, glucose, and urea, dissolved in a litre of blood or urine. With respect to kidney health, it shows the osmotic pressure of body fluids. The kidneys must carefully regulate this to keep cells hydrated and maintain the balance of electrolytes. They control osmolarity mainly by changing the excretion or reabsorption of water through Antidiuretic Hormone (ADH). If blood osmolarity increases, the body holds onto water to dilute the blood. This results in a higher total blood volume and, in turn, raises blood pressure. On the other hand, if the kidneys cannot properly concentrate or dilute urine, often due to damage from high blood pressure, it can cause long-term fluid imbalances.

Parameter	**Optimal Range**	**Unit**	**Patient value**	**Possible Root Cause**
Creatinine	0.8-1.1	mg/dL	0.75	Decreased muscle mass/Poor dietary protein intake or absorption/Muscle dystrophy
Blood Urea Nitrogen	12-19	mg/dL	7.72	Poor protein intake,digestion or absorption/Liver dysfunction/Vitamin B6 Deficiency
Osmolarity	288-292	mOsm/kg	284.28	Stress

Table 5: Parameters for Kidney Health

(e) Blood Parameters

Red Blood Cell (RBC) count

RBC/erythrocyte count measures the total number of mature RBCs per microliter of blood. These biconcave, anucleated cells are the main component of blood. They are produced through erythropoiesis in the bone marrow, regulated by the hormone erythropoietin. The RBC count is an important marker for total red cell mass. A high-normal or elevated RBC count often indicates stress polycythemia or volume contraction. A greater density of cells in the plasma increases friction against the vascular endothelium. This friction prompts the release of endothelin-1, a strong vasoconstrictor that narrows blood vessels and raises systemic vascular resistance. In this case study, the RBC count helps determine if the patient's hypertension is due to thick blood or an overstimulated bone marrow response to chronic hypoxia.

Mean Corpuscular Volume (MCV)

MCV is a calculated index that shows the average size (volume) of a single RBC, measured in femtoliters (fL). It is calculated by dividing the hematocrit by the total RBC count. MCV is the main tool to classify anemia into microcytic (small cells), normocytic (normal cells), or macrocytic (large cells). MCV gives insight into the flexibility of red blood cells. To pass through the smallest capillaries (which are often narrower than the RBC itself), a RBC must be able to bend.

High MCV (Macrocytosis): Larger cells are less flexible and can become trapped or move slowly through the microvasculature. This increased resistance in the peripheral beds leads to a rise in systemic blood pressure.

Low MCV (Microcytosis): Smaller cells are often misshapen (due to iron deficiency) and have lower oxygen-carrying efficiency. This can trigger the same hyperdynamic heart response seen in anemia.

Monitoring MCV in a hypertensive subject is crucial for identifying nutritional deficiencies including Vitamin B12, Folate, and Iron that might be complicating the vascular profile.

Mean Corpuscular Hemoglobin (MCH)

MCH is a calculated blood measurement that shows the average amount of hemoglobin in a single RBC. It is determined by dividing the total hemoglobin concentration by the total RBC count. While MCHC measures the concentration of hemoglobin based on cell size, MCH measures the actual weight of hemoglobin per cell, usually in picograms (pg). MCH is an important indicator of how effectively the bone marrow produces cells. It shows the availability of the raw materials needed for hemoglobin production—primarily iron, vitamin B6, and protein—as well as how well the body’s enzymatic processes create the heme molecule. MCH serves as a marker for how well blood carries oxygen

and how efficiently metabolism works. The link between MCH and blood pressure involves mechanical and compensatory body processes:

Oxygen Delivery and Cardiac Workload: A low MCH (hypochromia) means each RBC carries less oxygen than ideal. To make up for this, the heart has to increase cardiac to meet the oxygen demand of the body. This overactive state often results in higher systolic blood pressure.

Vascular Nitric Oxide Scavenging: Hemoglobin has a complicated role in managing nitric oxide (NO). Changes in hemoglobin density can affect how well hemoglobin scavenges or neutralizes NO in the blood vessels. When hemoglobin levels or distributions are not optimal, it can lead to lower available NO, causing poor blood vessel dilation and higher overall vascular resistance.

Oxidative Stress and Hemolysis: In some cases, low MCH is linked to weak red blood cell membranes. If these cells break (hemolysis) due to high pressure, free hemoglobin is released into the plasma. This free hemoglobin is very harmful to the endothelium and further reduces NO, creating a harmful cycle of increasing pressure and blood vessel damage.

Iron

Serum Iron measures the total amount of circulating iron bound to the transport protein transferrin. Iron is a vital trace element needed not only for producing hemoglobin but also for the function of cytochromes in the mitochondria and various enzymes involved in oxidation-reduction reactions. Iron is a highly reactive metal. Iron status is closely linked to oxidative stress in the vascular system. Excess free iron can spark the formation of hydroxyl radicals that lead to oxidative damage to endothelial cells, reducing NO availability. A lack of NO obstructs vasodilation, resulting in sustained hypertension. Even without severe anemia, low iron levels can harm mitochondrial function in cardiac and vascular smooth muscle. This leads to poor vascular tone and decreased cardiac efficiency.

Parameter	**Optimal Range**	**Unit**	**Patient value**	**Possible Root Cause**
RBC	4.8-5.5 (Male)	x10 (6) cells/ul	4.68	Anemia/Liver Dysfunction/Inflammation/Deficiencies: Protein, Vit E, Zinc, B-6, Vit A

MCV	84-92	Fl/cell	103.6	Deficiencies: Folate, Thiamine, VitaminC/Alcohol consumption
MCH	28-32	pg/cell	32.5	
Iron	80-100	mcg/dL	63.9	Iron Deficiency Anemia

Table 6: Blood Parameters that are associated with Hypertension

VII. Therapeutic Interventions to Combat Hypertension

Hypertension is rarely just a standalone issue; it usually signals problems with metabolism, oxidative stress, and an unstable nervous system. Here's an overview of iThrive's therapeutic strategies for hypertension, focusing solely on root cause analysis of the concerned subject.

Stress Management

The main goal in managing hypertension is to move from a "fight or flight" (sympathetic) state to a "rest and digest" (parasympathetic) state. In the case of the subject, this was achieved by the following measures:

Meditation and Breathwork

High cortisol levels often have an adverse effect in individuals with an elevated blood pressure. Regular meditation and structured breathwork, like Soma breath, activate the vagus nerve. This action stabilizes the heart rate and helps in relaxing blood vessels, which in turn directly attenuates pressure on arterial walls.

Improving Heart Rate Variability

In clinical observations, for instance, in the case of the subject, consistent breathwork and physical exercise have demonstrated the ability to improve heart rate variability, bringing a resting heart rate from over 100 beats/minute to 70 beats/minute, significantly reducing the mechanical workload on the cardiovascular system.

Dietary Modulation and Inflammation Control

Chronic inflammation can make blood vessel linings stiff and narrow, leading to endothelial dysfunction. Therefore, the given strategies are to be followed to avoid the same.

Elimination of Inflammatory Triggers

It is quite necessary to completely avoid gluten, dairy, refined sugars, and seed oils from the diet. These food items generally cause immune reactions that lead to damaging of the blood vessels.

Insulin Sensitivity
A strong link is associated between hypertension and insulin resistance. Following a low-carb, nutrient-rich diet helps in normalizing insulin levels. Higher insulin levels cause the kidneys to retain sodium and water, which increases blood volume and pressure.

Phytochemicals and Herbs
Incorporating anti-inflammatory herbs such as Turmeric and Kalmegh can help reduce oxidative stress that contributes to stiff arteries.

Circadian Rhythm and Adrenal Health
The internal clock of the human body manages the natural drop in blood pressure at night. Interrupting this cycle can result in chronic hypertension.

Blue Light Mitigation
Consistent exposure to blue light emitting from the screens late night leads to the reduction of melatonin and elevation of cortisol levels. Instaead, using yellow light and blue light filters can help provide protection to the adrenal glands and thus, prevent spikes in blood pressure due to stress.

The 10 pm to 2 am Window
The mentioned timeframe from 10 pm to 2 am is vital for physical body repair. Deep sleep during these hours helps the cardiovascular system to recover to a larger extent and also supports in regulating hormones that control fluid balance in the body.

Targeted Micronutrient Supplementation
Deficiency of certain minerals and antioxidants can contribute to high blood pressure.

Magnesium
Magnesium serves as a natural calcium channel blocker, helping the smooth muscles present within the walls of blood vessels to relax down.

CoQ10
Essential for mitochondrial health, CoQ10 provides energy to the cardiac muscle and acts as a strong anti-oxidant for the vascular system.

Omega-3 Fatty Acids (Krill Oil)

These fatty acids help reduce blood thickness and lower triglycerides, easing the heart's workload.

Environmental Detoxification

Modern hypertension can be influenced by obesogens (chemicals that disturb lipid metabolism and promote fat accumulation and obesity) and endocrine disruptors found in the environment.

Heavy Metal Mitigation

Lead, cadmium, and mercury can substantially elevate blood pressure by causing oxidative stress. Using stainless steel and glass containers can help prevent these metals from leaching into food.

BPA and Phthalates

BPA and Phthalates, prevalent mostly in plasticwares, can interfere with hormonal signals (such as estrogen), which help maintain blood vessel flexibility. Reducing toxic exposure through clean personal care products and filtered water is an essential long-term strategy.

Category	Intervention	Purpose of the Intervention	Clinical Impact on the Subject
Supplementation	Magnesium Bisglycinate	Acts as a natural calcium channel blocker; relaxes vascular smooth muscle	Significant reduction in resting heart rate
	Berberine	Activates AMPK; improves insulin signaling and reduces arterial inflammation	Stabilization of blood glucose levels and reversal of insulin resistance
	CoQ10	Enhances mitochondrial energy in cardiac tissue; potent antioxidant	Improved energy levels and enhanced cardiovascular endurance during exercise

	Vitamin D3 + K2	Inhibits Renin-Angiotensin system; prevents arterial calcification	Improved blood marker levels and long-term protection against arterial stiffness
	Omega-3	Reduces blood viscosity and systemic inflammation	Lowered triglyceride levels and improved systemic lipid markers
	NAC	Boosts glutathione; neutralizes oxidative stress in the endothelium	Reduced systemic inflammation markers and improved cellular recovery
Dietary	High-Protein & Low Carb	Reverses hyperinsulinemia; reduces renal sodium and water retention	Rapid weight loss (23kg) and elimination of fluid-driven edema
	Elimination of Gluten & Dairy	Removes dietary antigens that trigger immune-mediated vascular stress	Resolution of chronic digestive issues (constipation) and brain fog
	Millets	Provides a low-glycemic alternative to wheat/rice to prevent insulin spikes	Sustained energy levels throughout the day without post-meal crashes

	Seed Oil Elimination	Replaces inflammatory Omega-6 with stable fats like Ghee/Coconut Oil	Reduction in oxidative markers (GGT) and improved liver health
	Hydration	Balances electrolytes (Pink Salt) to support blood volume	Improved kidney function markers and reduced frequency of headaches
Lifestyle	Meditation & Soma Breath	Increases parasympathetic tone via vagus nerve stimulation	Direct on-demand lowering of blood pressure and reduced anxiety
	Functional Training	Enhances stroke volume and muscle-mediated glucose disposal	Increased metabolic rate and maintenance of lean muscle during weight loss
	Sunrise Exposure	Resets the circadian clock; regulates melatonin and cortisol	Improved sleep quality and morning alertness without caffeine
	Sauna / Thermal Therapy	Promotes vasodilation and metabolic waste excretion via sweat	Enhanced detoxification and improved peripheral circulation
Circadian	Blue Light Mitigation	Protects melatonin; prevents evening cortisol-driven BP spikes	Normalized nocturnal blood pressure "dipping" and deeper sleep

	10 PM – 2 AM Sleep Window	Maximizes the primary window for physical and vascular repair	Accelerated healing of injuries and improved hormonal balance
Environmental	Activated Charcoal	Adsorbs heavy metals/pesticides to prevent vasoconstriction	Reduction in toxic load and improvement in liver markers
	BPA & Plastic Avoidance	Limits xenoestrogens that disrupt hormonal regulation	Improvement in endocrine health
	Grapeseed oil	Destroys all intestinal parasite eggs present in raw leafy vegetables	Prevents infestation of parasites in the gut

Table 7: Therapeutic Interventions and Their Impact on the Subject

VIII. Results

Following close examination of the root causes behind hypertension and implementing a customized nutrition plan, the subject observed remarkable changes in many of his health markers. He focused on eradicating inflammatory triggers, addressing significant micronutrient deficiencies, and supporting metabolic health with specific nutraceutical supplements. This approach helped him make a transition from chronic cardiovascular strain and digestive issues to superior health. The results below underscore not just the physical changes but also a complete restoration of his internal balance.

Significant and Sustained Weight Loss

The subject lost an impressive 23 kg of his body weight, going from 114 kg to 91 kg. His waist size decreased from 38 inches to 32 inches, indicating a clear drop in visceral fat. Following a 9-day detox plan, he lost 3 kg, showing how well his body responded to

removing inflammatory triggers. Even with a temporary injury that limited his body movement, he maintained his weight loss by strictly following the customized ALIVE plan by iThrive.

Resolution of Chronic Digestive Issues

At the beginning of the ALIVE program, the subject struggled with severe constipation nd acidity, especially during fasting. By eliminating inflammatory foods and adding probiotics and digestive enzymes like “Now Foods Super Enzymes”, his digestive issues were completely resolved by the end of the second month. His records show a shift from irregular bowel movements to a steady, healthy digestive pattern.

Cardiovascular Recovery and Blood Pressure Normalization

One of the most notable improvements was in his cardiovascular health, which had previously been in a high-risk zone. The subject normalized his blood pressure with natural supplements like CoQ10 and Magnesium, along with dietary changes that reduced his need for long-term medication. His resting heart rate, which had been above 100 beats/minute, dropped to below 70 beats/minute. This indicates a much more efficient and relaxed heart muscle.

Metabolic and Liver Function Restoration

The subject’s initial blood reports indicated signs of fatty liver and insulin resistance. His ALT decreased from 80.5 IU/L to 34.7 IU/L, and GGT from 55.9 IU/L to 23.7 IU/L, showing a major improvement in hepatic health. With Berberine and BioGymnema, he improved his insulin sensitivity, reducing his risk of metabolic syndrome.

Enhanced Energy and Mental Well-being

He transitioned from feeling lethargic to feeling energetic throughout the day. Regular meditation and Ashwagandha helped him significantly lower stress and improve his emotional stability. He shifted from erratic workouts to a consistent fitness routine, fundamentally changing his approach to food and exercise.

Parameter	Before Intervention	After Intervention	Result
Body Weight	114 kg	91 kg	Lost 23 kg

Waist Size	38 inches	32 inches	Lost 6 inches
Hypertension	High BP (Taking Olmezest H40)	Normalized naturally (Off medication)	Resolved
Resting Heart Rate	>100 bpm (Tachycardia)	<70 bpm (Healthy range)	Significant Improvement
Constipation / Acidity	Chronic & severe	Completely absent	Resolved
ALT (Liver Enzyme)	80.5 IU/L (High)	34.7 IU/L	Significant Improvement
GGT (Oxidative Stress)	55.9 IU/L (High)	23.7 IU/L (Optimal)	Fixed
Vitamin D Levels	Deficient	Optimized	Fixed
Energy Levels	Lethargic / Low energy	Regained Energy	Significant Improvement
Exercise Routine	Irregular / Minimal	Disciplined & Regular	Lifestyle Change
Stress Levels	High	Managed through meditation	Significant Improvement

Table 8: Results Before and After Therapeutic Intervention

IX. Discussion

(A) The Insulin-Hypertension Link: Metabolic Drivers of Vascular Resistance

The clinical resolution of the subject's hypertension demonstrates that high blood pressure is often caused due to underlying insulin resistance.

Hyperinsulinemia and Renal Sodium Retention

The subject's initial signs of fluid retention and high blood pressure align with insulin's role in kidney function. Insulin directly acts on the kidneys to increase sodium reabsorption in the distal tubule and the Loop of Henle. This process expands plasma volume and raises blood pressure. By following a low-carbohydrate plan, the subject lowered circulating insulin, promoting "natriuresis of fasting" and naturally reducing his fluid-driven blood pressure.

Sympathetic Nervous System (SNS) Overactivity

A key aspect of the subject's condition was a resting heart rate over 100 beats/minute. Chronic hyperinsulinemia boosts sympathetic nervous system activity by raising norepinephrine levels. This contributes to a higher heart rate and increased peripheral vascular resistance. The subject's resting heart rate fell to below 70 beats/minute as his insulin levels stabilized with the removal of refined sugars.

Endothelial Dysfunction and Nitric Oxide

The subject initially relied on Olmezest H 40, an angiotensin receptor blocker (ARB), due to poor vasodilation. In insulin-resistant states, the PI3K/Akt pathway, which produces the vasodilator nitric oxide (NO), is not functioning properly. Meanwhile, the MAPK pathway remains active, leading to production of the potent vasoconstrictor endothelin1. The iThrive protocol, which included Berberine, aimed to address this issue. Berberine has been shown to improve endothelial function by activating AMP-activated protein kinase (AMPK), promoting NO production and reducing oxidative stress in blood vessels.

The Role of Magnesium as a Functional Antagonist

The protocol's focus on Magnesium Bisglycinate is essential to combat the subject's vascular tension. Insulin plays a major role in managing magnesium levels, but in people with insulin resistance, magnesium often gets lost through the kidneys. This leads to a harmful cycle where a lack of magnesium worsens insulin signaling and causes blood vessels to narrow. Restoring this micronutrient acted like a "calcium channel blocker," helping to relax the muscle around the blood vessels.

(B) The Role of Liver Homeostasis and Gamma-Glutamyl Transferase (GGT) in Blood Pressure Regulation

The analysis of the subject's blood markers shows a key link between liver health and blood vessel resistance. A notable result from the 2022–2025 protocol was the normalization of Gamma-Glutamyl Transferase (GGT), which changed from an elevated 55.9 IU/L to a healthy 24 IU/L.

GGT as an Independent Predictor of Hypertension

In clinical research, GGT is not seen just as a marker of alcohol use or bile blockage. Studies have shown that serum GGT level is a strong independent predictor of high blood pressure. This is likely because GGT helps transport amino acids across cell membranes and plays a role in the metabolism of extracellular glutathione. The decrease in GGT suggests a significant drop in overall oxidative stress, easing the strain on the cardiovascular system.

Oxidative Stress and Nitric Oxide Bioavailability

The subject's initial RCA identified oxidative stress as a major health concern. Higher GGT levels are linked to the production of reactive oxygen species (ROS) when iron and other transition metals are present. This leads to oxidative changes in low-density lipoproteins (LDL) in the arterial walls. This oxidative state reduces nitric oxide, an essential vasodilator. By lowering GGT, the subject restored redox balance, which increased the availability of nitric oxide and allowed for natural relaxation of blood vessels.

The Hepatic-Metabolic Link

The subject's ALT and AST levels also showed dramatic improvements, falling from 80.5 IU/L and 45.4 IU/L respectively to healthy ranges. High hepatic enzyme levels refers to Non-Alcoholic Fatty Liver Disease (NAFLD), which is closely tied to insulin resistance and greater arterial stiffness. The iThrive protocol, using NAC (N-Acetyl Cysteine) and Silymarin (Milk Thistle), supplied the components needed for liver detoxification. NAC, as a building block for glutathione, helps to eradicate ROS produced by a high-calorie, inflammatory diet. This protects the liver and blood vessel lining from damage.

Detoxification and the Allostatic Load

The addition of Activated Charcoal and the 9-day Detox Plan tackled the subject's "Toxin Overload." Environmental toxins and heavy metals can disrupt the renin-angiotensin-aldosterone system (RAAS), which leads to consistently high blood pressure. By using binders and supporting liver functions, the subject lowered his total "allostatic load," allowing the body to return to a balanced state where medication for blood pressure control was no longer needed.

(C) Micronutrient Synergy: Magnesium and Vitamin D3/K2 in Vascular Homeostasis

The case study shows that reversing hypertension often relies on correcting chronic micronutrient deficiency. The subject's approach focused on a combination of Magnesium Bisglycinate and Vitamin D3 + K2, addressing the body's needs for arterial elasticity and smooth muscle relaxation.

Magnesium as a Natural Calcium Channel Blocker

At the beginning of the intervention, the subject's RCA showed a clear need for Magnesium. It works as a natural calcium blocker. It competes with calcium for binding sites on vascular smooth muscle, which helps prevent excessive contraction that can cause high blood pressure. By taking the highly absorbable Bisglycinate form, the subject provided his vascular system with what it needed to maintain vasodilation,

mimicking the effects of pharmaceutical calcium channel blockers without the systemic side effects.

The Vitamin D-Renin Connection

The subject's initial findings indicated a Vitamin D deficiency, a common factor in essential hypertension. Vitamin D effectively reduces renin production; a deficiency of vitamin D can make the RAAS overly active. This leads to increased peripheral resistance and blood volume. Consistently consuming Vitamin D3 helps in reducing RAAS activity, which aids in controlling blood pressure.

Vitamin K2 and the Prevention of Arterial Calcification

While Vitamin D3 increases calcium absorption, the subject's plan included Vitamin K2 too. Vitamin K2 activates Matrix Gla Protein (MGP), which inhibits vascular calcification. Without enough K2, extra calcium can build up in the arterial walls. For someone like the subject in the study, who was managing long-term hypertension, preserving arterial flexibility through K2-activated proteins was crucial for reducing systolic pressure.

Synergy Between Magnesium and Vitamin D Metabolism

The plan acknowledged that these nutrients work together. All the enzymes that process Vitamin D depend on magnesium as a cofactor. So, if a magnesium-deficient person takes Vitamin D, it can lead to more magnesium depletion and less effective Vitamin D activation. By supplementing both at the same time, metabolic efficiency was ensured, which helped achieve the status of the nutrient markers of the subject by 2024.

(D) Gut-Vascular Axis: Chronic Constipation, Dysbiosis, and Systemic Hypertension

In the clinical assessment of the subject, digestive issues, specifically constipation, were a big concern for his health. The resolution of this gastrointestinal symptom coincided with the normalization of his blood pressure.

The Role of Dysbiosis in Inflammation

The blood test of the subject revealed elevated globulin levels and a low albumin/globulin ratio. These two markers are often associated with chronic infection or inflammation, besides liver health. Gut dysbiosis and increased intestinal permeability, also known as leaky gut, allow lipopolysaccharides to enter the bloodstream, which trigger an inflammatory response that disturbs endothelial function and leads to arterial stiffness. By removing inflammatory triggers such as gluten and dairy, the protocol reduced the antigenic load, thereby lowering inflammatory stimulus on the vascular walls.

Chronic Constipation and Irregular Bowel Movements

The subject reported about constipation that also increases the risk of cardiovascular events. The physical effort of defecation leads to sharp spikes in blood pressure and heart rate. Over a period of time, this can create changes in blood vessel structure. Switching to a high-fibre, nutrient-rich diet, along with magnesium bisglycinate and probiotics, normalized his bowel movements, thereby reducing these daily hemodynamic stressors.

Short-Chain Fatty Acids (SCFAs) and Blood Pressure Regulation

Probiotics and prebiotics consumption are useful for the gut microbiota to produce SCFAs. SCFAs, such as butyrate and propionate produced by gut bacteria, interact with G-protein-coupled receptors in blood vessels and kidneys. This regulates blood pressure and reduces vascular resistance. The introduction of probiotics and prebiotics to the diet of the subject helped him regain energy and vitality, which indicates a healthy gut-vascular relationship.

(E) Circadian Rhythm and Sleep Pattern: Impact on Cortisol and Blood Pressure

A crucial but often ignored part of the subject's daily routine was the circadian rhythm. The subject changed from irregular sleep and late-night screen use to a consistent sleeping pattern. The impact it had on him was immensely positive in maintaining his blood pressure.

The Role of Blue Light and Cortisol Dysregulation

At the beginning of the program, the subject was told to install blue light filters and limit screen time after 9:00 PM. Evening exposure to artificial blue light lowers melatonin production and increases cortisol levels. This leads to nocturnal high blood pressure and disrupts the "nocturnal dipping" effect (10-20% natural drop in blood pressure during sleep) needed for cardiovascular recovery. By adjusting his light exposure, the subject was able to stabilize his blood pressure.

The Sleep Window and the Growth Hormone

The iThrive protocol highlights the importance of the 10:00 PM to 2:00 AM window for physical repair. Sleep during this time is linked to peak growth hormone production and lower RAAS activity. Disruptions in this window are associated with increased arterial stiffness and metabolic problems. This adjustment helped the subject go from feeling lethargic to being energetic.

Melatonin as a Vascular Antioxidant

By improving his sleep-wake cycle, the subject increased his natural melatonin production. Melatonin is both a hormone and an antioxidant that mitigates free radicals in the blood vessels and enhances nitric oxide availability, leading to a decrease in

blood pressure. This biochemical benefit worked well with the subject's use of Magnesium and CoQ10 to lower oxidative stress.

Early Morning Sunlight and the Cortisol Awakening Response (CAR)
The subject was advised to get sunlight at sunrise before any other light. Early morning sunlight helps set the Cortisol Awakening Response (CAR), ensuring cortisol levels peak in the morning for energy and drop correctly in the evening for relaxation and blood vessel dilation. This synchronization with his circadian rhythm was the key to reducing his resting heart rate from over 100 beats/minute to below 70 beats/minute.

(F) Regulation of Blood Pressure through Exercise and Mindfulness
The subject's tachycardia and hypertension improved significantly also due to changes made through daily exercise and meditation. By combining regular exercise with mindfulness practices, he shifted from a fight-or-flight state to a relaxed one.

Exercise and Myokine-Mediated Vasodilation
The subject moved from sporadic workouts to a steady routine that included regular exercise that allowed the vascular endothelium to produce nitric oxide and release myokines like IL-6. These help reduce inflammation as well as peripheral vascular resistance. He noted that "adding physical activity to the iThrive methodology worked wonders," acting like a pump to enhance circulation and reduce arterial stiffness.

Soma Breath and Meditation
The personalized protocol for the subject included "Soma Breath" and meditation to meet the mental health goal from his RCA. Meditation and deep breathing exercises are well-known to help alleviate the overactivity of the sympathetic nervous system, a key contributor to hypertension and an increase in heart rate. By consciously following this simple exercise, he was able to have a stable resting heart rate at a healthy level of 70 beats/minute.

Letting Go of Conventional Medicine
The subject followed a maintenance protocol prepared by the iThrive Team that helped him to experience "Post-Exercise Hypotension." After working out, his blood pressure stayed below pre-exercise levels for several hours due to a temporary decrease in sympathetic nerve activity and a lasting increase in systemic vasodilation. For someone who previously relied on Olmezest H 40, this natural medication effect from daily movement was essential in keeping his blood pressure normal without conventional medications.

Cortisol Regulation and Heart Rate Improvement

The amalgamation of meditation and exercise acts as a shield against stress-associated cortisol spikes. Chronic stress raises cortisol levels, which makes blood vessels more sensitive to vasoconstrictors like norepinephrine. Regular meditation improves heart rate, indicating better cardiovascular health and autonomic balance. He reported feeling "energetic all the time," reflecting a nervous system no longer worn out by constant high-pressure signals.

X. Conclusion

The current case report shows that chronic hypertension and tachycardia are not necessarily permanent problems requiring lifelong medication. By addressing the underlying root causes, including insulin resistance, oxidative stress, inflammation, infection and micronutrient deficiencies, it is possible to restore normal blood pressure and eliminate the need for antihypertensive drugs. The successful transition from the highest therapeutic dose of Olmezest H 40 to a stable, medication-free normal blood pressure was closely linked to the normalization of hepatic enzymes and the correction of magnesium and vitamin D deficiencies. Furthermore, the significant decrease in resting heart rate from over 100 beats/minute to under 70 beats/minute highlights how metabolic reprogramming and alignment with circadian rhythm can positively impact the autonomic nervous system to a great extent. This case provides strong evidence for including functional nutrition in standard cardiovascular care. It shows that a structured, food-is-medicine approach combined with specific nutraceutical support can effectively reverse the physiological triggers of high peripheral resistance, offering a lasting, drug-free option for patients facing high-grade hypertension and metabolic issues.

Supplementary

TABLE 1: Supplements given to our client

Supplements	Brand/Manufacturer	Purpose and Benefits
Magnesium Bisglycinate	iThrive	Corrects deficiency, supports muscle relaxation, improves sleep, and helps lower blood pressure.

B Complex	iThrive	Energizes the body, supports methylation, and addresses nutrient deficiency anemia.
Vitamin D3 + K2	iThrive	Boosts the immune system, improves cardiovascular health, and supports bone density.
Zinc Defense	iThrive	Improves the immune system and supports the metabolism of various nutrients.
Omega-3	Codeage	Reduces inflammation and improves cardiovascular health.
Probiotics with Prebiotics	iThrive	Restores gut microbiome balance and aids in the absorption of iron and other nutrients.
Super Enzymes	Now Foods	Specifically introduced to resolve chronic constipation and acidity by supporting digestion.
CoQ10 with L-Carnitine	iThrive	Provides mitochondrial energy for the heart muscle and was key in normalizing his heart rate.
Immune Support	iThrive	Reduces infection and maintains a healthy immune system

Red Yeast Rice Extract	Trexgenics	Improves cholesterol levels in the body
Ashwagandha	Organic India	An adaptogen used to lower stress levels and support mental health
Trimethylglycine (TMG)	Nutrija	Maintains healthy homocysteine levels
Milk Thistle (Silymarin)	Himalayan Organics	Specifically targeted to reverse fatty liver and improve hepatic (ALT/GGT) markers.
NAC	Now Foods	A precursor to glutathione that supports liver detoxification and reduces oxidative stress.