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Case Report

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MANAGEMENT OF GRADE II NON-ALCOHOLIC FATTY LIVER DISEASE (NAFLD) THROUGH AYURVEDA: A CASE REPORT

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ABSTRACT

Non-alcoholic fatty liver disease (NAFLD) is one of the most common liver diseases caused by the accumulation of extra fat (lipids) in the liver. In the majority of cases, this may go unnoticed and not result in any major consequences but may sometimes lead to liver damage. In Ayurveda, this can be termed as Yakrit vikar (~liver disorder) which is associated with Medoroga (~fat related disease). In the present case, a 58-Year-old female patient with symptoms of grade- II fatty liver disease visited Ayurvedic Hospital. Hematological analysis revealed deranged lipid profile, including total cholesterol (227.4 mg/dl), low density lipoprotein (139.0mg/dl) and triglycerides (166.0mg/dl). The patient was provided with Ayurveda treatment for forty-five days after obtaining written consent. Assessment was done based on signs and symptoms [like, Agnimandya (~digestive insufficiency), Udaradhmana (~abdominal distension), Aruchi (~anorexia), Apakti (~indigestion), Malavishtambha (~constipation), Shirashoola (~headache)] and hematological parameters and Ultrasound before and after treatment. Changes in the ultrasound were seen, along with improvements in the hematological parameters and clinical signs and symptoms of the disease. The present study suggested the comprehensive and safe approach of Ayurveda treatment in managing liver disease.

Keywords: Ayurveda, Fatty Liver, Medoroga, Non-Alcoholic Fatty Liver Disease (NAFLD), Yakrit vikar

INTRODUCTION

Non-Alcoholic Fatty Liver Disease (NAFLD) is characterized by the presence of macro vesicular changes without inflammation (steatosis) and lobular inflammation in the absence of significant alcohol use inside the liver. The pooled prevalence of NAFLD is approximately 38.6%. It is higher in hospital-based data as compared to community-based data (40.8% vs. 28.2%).¹⁻² NAFLD can be further classified as Non-Alcoholic Steatohepatitis (NASH) and Non-Alcoholic Fatty Liver (NAFL) or steatosis. The accumulation of excess fat in the Liver, known as steatosis, involves more than 5% Liver parenchyma, with no hepatocyte damage.³ Steato-hepatitis is a necro-inflammatory condition, or inflammation of the liver due to excess fat.⁴ Based on available data, the cornerstones of managing Non-Alcoholic Fatty Liver Disease (NAFLD) include controlling weight and diet in addition to reducing cholesterol levels using a combination of medications. However, no medication has been approved by the Food and Drug Administration for NAFLD till now.5 The most common cause of death in NAFLD is cardiovascular disease.⁶⁻⁷ In Ayurveda, NAFLD can be correlated with Yakrit vikara (~liver disorder) and Medoroga (~fat related disease).8 The ancient text of Yogratnakar described that Vidahi (~spicy) and Abhishyandi ahara (~food that blocks the channels) creates Rakta-kapha dushti inside the body which in turn causes Yakritodara (~hepatomegaly) when got accumulated.9 Considering the long term complications and associated co-morbidities with no standard treatment, the present study with Ayurveda approach of managing Yakrit vikara was initiated to observe its effect and safety in the management of liver disease (NAFLD).

Patient Information

A 58-year old female presented in the Kaychikitsa OPD in Ayurveda Hospital on 02/11/2022. She has complaints of pain in abdomen, loss of appetite, indigestion, generalized bodyache, and weakness since last four months. According to her, she was asymptomatic four months back. Gradually she developed all these symptoms and visited a nearby clinic for its management. She took general medicines for these complaints and got no relief from there. Then, she was diagnosed as having Grade- II fatty Liver by Ultrasound (USG-Whole abdomen) done on 30/10//2022.

According to the patient's past medical history, she is taking tablet Atenolol 50mg once daily for hypertension since last five years. History of allergy to drug, diet or medications was not reported. As per surgical history, she underwent a cholecystectomy in 2017. No significant family history of the patient is obtained.

Clinical Findings

The patient had a BMI of 29.6, a weight of 64 kg, and a height of 147 cm, indicating overweight as per World Health Organization (WHO) criteria. On Examination, the patient was well oriented, stable and conscious. As per personal History, the patient is having pure vegetarian diet with history of excess intake of spicy, oily, and fatty food as well as irregular mealtimes and duration. Sleep was sound and normal. No history of any addiction was found. On vitals examination, Temperature – 98.6° F, BP - 160/90mm Hg, Pulse-78/min, Respiration rate- 20/min. On Gastro-intestinal (GIT) examination, mild distension of abdomen on inspection and non-tenderness on palpation was found. No abnormal findings such as Ascites/ Hepatomegaly/ Splenomegaly

were noted during clinical examination. Other systemic examinations like respiratory system and cardiovascular system was found to be normal. The Ayurvedic Ashtavidha parikshana (~Eightfold Examination) was also done in which, Nadi (~Pulse) was Niyamit (~regular), Mala (~Stool) Kathina, Mutra(~Urine) Samyaka, Jivha (~Tongue) Saama, Shabda (~Speech) Spashta, Sparsha (~Touch) Samshitoshna, Druka (~Vision) Nirmala, Akriti (~Posture) was Sthoola.

Diagnostic Assessment

Raised echotexture in liver suggested of grade- II fatty liver as per Ultrasound (USG) findings was considered as objective parameter. [Figure 1] Subjective assessment was done on the basis of signs and symptoms like, Agnimandya (~digestive insufficiency), Udaradhmana (~abdominal distension), Aruchi (~anorexia), Apakti (~indigestion), Malavishtambha (~constipation), Shirashoola (~headache) were also considered for diagnosis.¹⁰⁻¹¹ Hematological parameters like Complete Blood Count (CBC), Liver Function Test (LFT), Kidney Function Test (KFT), Thyroid Profile were found to be within normal limits. Lipid profile was deranged with Serum cholesterol - 227.4 mg/dl, Serum Triglyceride - 166.9 mg/dl, Low Density Lipoprotein (LDL) - 139.0 mg/dl. [Fig. 2] On the basis of subjective and objective parameters, Yakrit vikara (~liver disorder) associated with Medoroga (~fat related disease), i.e. Non-Alcoholic Fatty Liver Disease (NAFLD) grade II was diagnosed.

Timeline- The detailed timeline of the present case is mentioned in Table 1.

SN	Date and Day	Medication	Dose Frequency and Indication	Duration	Investigations and Results		
1.	Day 1 - 1 st visit	Navayas lauha (125mg)	1 Tab Twice Daily, with water after food	15 Days	Raised Echotexture in Liver		
	(02/11/2022)	Rohitakarisht	20ml Twice Daily, with equal amount of		in USG and deranged Lipid		
	Before Treatment		water after food		profile,		
		Chitrakadi vati (125mg)	2 Tab. Twice Daily, with water after food		Mild to severely deranged		
		Triphala guggulu	1Tab		subjective parameters		
		(250mg)	Thrice Daily, with water after food				
		Aarogyavardhini vati	1Tab Twice Daily, with water after food				
		(125mg)					
2.	Day 15- 2 nd visit	Same treatment was	Same	15 Days	Not done.		
	(17/11/2022)	followed					
	Day 30 - 3 rd Visit						
	(02/12/2022)						
3.	Day 45 - 4 th Visit	No treatment	None	15 Days	Normal Echotexture in Liver		
	(17/12/2022)				in USG and normal Lipid		
	After Treatment				profile. Mild change in		
<u> </u>					subjective parameters.		
4.	Day 60- 5th Visit	No treatment was given	N/A	-	Normal Objective and		
	Follow-Up				Subjective parameters		
	(31/12/2022)						

Table 1: Timeline of the Ayurveda treatment

Therapeutic Intervention: After obtaining written informed consent from the patient, she was provided with Ayurvedic medication for 45 days with a regular interval of 15 days. [Table 1] The follow-up was done after 15 days of the completion of the treatment.

Assessment: The assessment was done before and after the treatment based on presenting complaints of the patient, subjective parameters⁹ and USG findings before and after treatment i.e. after 45 days.

RESULTS

Follow-Up and Outcomes

After Completion of treatment, no raised echotexture in the liver as evident in Ultrasound, revealing Grade II fatty liver turned to normal. [Table 2] [Figures 1 and 2] Marked improvement in the subjective parameters was also reported. The before treatment (BT) score of Agnimandya, Aruchi, Apakti and Malavishtambha indicates severe effect, which after treatment changed to mild effect with after Treatment (AT) score 0. [Table 3]

DISCUSSION

Fatty liver is basically accumulation of fat (lipids) in liver. Kapha (~Dosha) and Meda Dushya (~fat) are two main factors responsible for pathogenesis of Sthaulya (~obesity).¹² As per Ayurveda, Samprapti Ghataka (aetio-pathogenesis) of the disease is mainly due to Santarpana (~overeating and sedentary lifestyle). It causes vitiation of Kapha dosha along with Rasa, Rakta and Meda Dushti, resulting in depletion of digestive as well as metabolic fire (~Agnimandya and ~Dhatvagni mandya). Thus, creating Sang, Vimargaman type of Strotodushti in Rasavaha, Raktavaha and Annavaha Strotas, due to this accumulation of Meda (~fat) occurs in the body. Under favorable conditions when the accumulation initiated inside the liver cells (~Yakrit) as Adhishthan, it may lead to develop fatty liver. As per classics, Deepana (~enhancing metabolic fire digestion), Pachana (~metabolism of Aam ~toxins and intermediary products of metabolism of proteins, fats and the carbohydrates), and Lekhana (~scrapping of excess fats) principles are used in managing such conditions.13

Table 2: Change in	Radiological f	indings (U.S.G.	Whole Abdomen)

S. No.	Parameters	Before treatment (30/10//2022)	After treatment (17/12/2022)
1.	USG	Raised echo texture in liver showing grade II	No raised echo texture in the liver.
		fatty liver.	Normal U.S.G. impression.
2.	Lipid profile		
	Serum cholesterol (in mg/dl)	227.4	168.7
	Serum Triglycerides (in mg/dl)	166.0	152.5
	LDL (in mg/dl)	139.0	110.4

S. No.	Subjective Parameter	Before treatment (Day 1) (02-11-22)	After Treatment (Day 45) (17-12-2023)	On Follow-up (Day 60) (31-12-2022)
1	Agnimandya	Severe	Mild	None
	(Digestive insufficiency)	(3)	(1)	(0)
2	Udaradhmana	Mild	None	None
	(Abdominal distension)	(1)	(0)	(0)
3	Aruchi	Severe	Mild	None
	(Loss of apetite)	(3)	(1)	(0)
4	Apakti	Severe	Mild	None
	(Indigestion)	(3)	(1)	(0)
5	Malavishtambha	Severe	Mild	None
	(Constipation)	(3)	(1)	(0)
6	Shirshoola	Mild	None	None
	(Headache)	(1)	(0)	(0)
7	Weight (In Kg)	64	60	59

Table 3: Changes in subjective parameters of the patient

At the level of Agni, all the drugs in Chitrakadi vati have Deepan and Pachan properties. The Katu, Tikta rasa, Laghu and Tikshna guna helps in enhancing and maintaining a balanced Jatharagni. All these properties together help in eliminating the Strotorodha caused by Aam and also controls the aggravated Kapha, and hence Kaphavatahara in action.¹⁴ Arogyavardhini vati is mentioned under the context of Yakrit vikar (liver disorders).¹⁵ Navayas lauha and Rohitakarishta contains drugs which have Deepan and Pachana properties.¹⁶⁻¹⁷ These control the aggravated Kapha and enhance metabolism and are also act as hepatoprotective and antioxidant. Triphala guggulu acts by virtue of its Lekhniya property.¹⁸ Triphala eliminates the extra fat and toxins from the body (Aam) and Guggulu helps in reducing blood cholesterol level. Thus, the management of the patient was also

focused to improve metabolism, as well as to provide hepatoprotective and antioxidant properties resulting in removal of fat deposited in the liver as evident by ultrasound. A daily laxative in the form of Triphala churna is given to the patient for complete evacuation of bowel which is an important line of treatment in managing Medoroga and Udararoga (abdomen-related disorders). The beneficial effects of satisfactory bowel evacuation were observed in this case. These findings highlight the usefulness of Ayurvedic interventions in the management of non-alcoholic fatty liver diseases.

The present study was conducted in accordance with ICMR National Ethical Guidelines for Biomedical and Health Research involving Human Participants.¹⁹



Figure 1: Before and After Treatment Ultrasound reports of the patient

Before treatment				After treatment			
DIAGNOSTICS corp Diagnostics Pvt.Ltd.		MC-3353	 011 42646464, +91-9899090037 info@ldpldiagnostics.com 		ORY REPORT	r	Redcliffe
About Displaced Policy Displaced to Policy Name : Displaced to Policy Displaced to Policy Age/Gender : 5B Yrs/Female Referred Client : LDPL061-LDPL061 Referred By : SELF Doctor Name :	Uid Labcorp Diagnositics Pvt, (td.	Patient UID. Visit No. Collected on Received on Reported on	Et Het Lta Latourg (Lidentity) fiel April / : 3980910 : 008923113000001 : 30-0ct - 2022 08:00AM : 30-0ct - 2022 10:27AM : 30-0ct - 2022 10:27AM : 30-0ct - 2022 10:27AM	Patient Name : DOB/Aga/Gender : 58 (Fernale) Patient ID : 277323 Rofered By : SELF Sample Type : Serum Client : Home Collection - Delhi -		Sample Coll .Sample Re Report Date	ec 17, 2022, 02:13 p.m. lected : Dec 17, 2022, 06:00 a.m ceived : Dec 17, 2022, 02:14 p.m. : Dec 17, 2022, 04:48 p.m. : 12148312222
Sample Type Serum - 12005042,W	hole Blood EDTA - 12005043,S	od.Fluoride - F	12005044, -	Test Description	Value(s)	Unit(s)	Reference Range
Test Name	BIOCHEMISTRY Results LIPID PROFILE BASIC 227.4	Unit mg/dL	Bio. Ref. Interval		VITAL SCREENIN Lipid Scr		
Methodology: Cholesterol Oxidase,Esterase,Peroxidase		mg/dL	200-239 Borderline high risk >240 High risk <150	TOTAL CHOLESTEROL Method : Enzymatic - Cholesterol Oxidas	168.7 e	mg/dL	Desirable : <200 Borderline : 200-239 High : >240
Wethodology: Engmatic End Point CHOLESTEROL - HDL (DIRECT) Wethodology: Direct Engmatic Caloximetric NON-HDL CHOLESTEROL	166.0 44.70 82.00	mg/dL mg/dL	>40 Recommended Range	TRIGLYCERIDES Method : Colorimetric - Lip/Glycerol Kina	152.5 50	mg/dL	Normal : <150 Borderline : 150-199 High : 200-499 Very high : >500
HOLESTEROL-LDL (DIRECT) Arthodology: Calculated	139.0	mg/dL	<130 Recommended Range	HDL CHOLESTEROL	46	mg/dL	35 - 60
ADL ,SERUM Acthodology: Spectrophotmetry/Calculated	41.10	mg/dL	0.00 - 45.0	Method : Phosphotungstic acid- Enzymat NON HDL CHOLESTEROL	134.3	mg/dL	<130
HOL/HDL Ratio	5.08	Ratio	3.40-4.40	Method : Calculated			
DL/HDL Ratio #thodology: Calculated BL/LDL CHOLESTEROL RATIO #thodology: Calculated #erenvec ranoes as per neep atp # guidunes	3.10 1.09	Ratio Ratio	10-3.5 <3.50	LDL CHOLESTEROL	110.4	mg/dL	Desirable : <100 Near optimal : 100-129 Borderline : 130-159 High : >160
TOTAL CHOLESTEROL mg/di HDL mg/di LDL	mg/di TRIGLYCERIDES mg			V.L.D.L CHOLESTEROL	32	mg/dL	< 30
besirable e200 Low e40 Optimal Indextentine High 200-230 High 240 Near Opt	e100 Normal e15 imal 100-129 Redectine High 150	-199	10	Method : Calculation CHOL/HDL Ratio	3.66		35-50
High 2002.00 Pigs 200 Borderin High 240 High NLERTIII 10-12 hours fasting is mandatory for lipid p	e High 130-159 160-189 High 200 h >190 Very High >50	-499 0	E L	Method : Calculated HDL/LDL RATIO Method : Calculated	0.41		Desirable : 0.5 - 3.0 Borderline : 3.1 - 6.0
3.NICAL HOTES independent and screening test for absorbedies in lipids and/ovascular disease, certain forms of pancreatitis. Hype is flat factor for coronary artery disease, especially when los Berark . Measurements in the same patient can show phys Berark . Measurements in the same patient can show phys that a family history of premature cardiovascular disease or the a family history of premature cardiovascular disease.	The results of this test can identify certain trighyceridemia is indicative of insulin resiat # HDL is present TG of 500mg/sL or more iological & analytical variations. 3 serial san the age of 20 wars should be screened for	genetic diseases & c ance when present w can be concerning fo riples 1 week apart ar lipid status.Selective	th low HDL & elevated LDL, while elevated TG is development of pancreatitis.	LDL/HDL Ratio Method : Calculated Interpretation	2.40		High : > 6.0
as an independent risk factor for Coronary Heart Disease (C	HD) .	and the second second	and a second a second a second second				Santal
	*** End Of Report ***						Dr. Saurabh Garg Consultant Pathologist M.D. D.N.B. (Pathology)
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Figure 2: Before and After Treatment Lipid profile reports of the patient

CONCLUSION

Non-Alcoholic Fatty Liver Disease (NAFLD) is a disease with extremely widespread yet unmet therapeutic needs and is associated with metabolic comorbidities including obesity, type 2 diabetes mellitus, hypertension and dyslipidemia. Since recent guidelines only recommend lifestyle modifications and bariatric surgery for its treatment due to lack of standard treatment protocol. In order to achieve personalized medicine and treatments for this condition, more accurate therapeutic recommendations would be required. The swift rate of change in lifestyle and increasing prevalence of associated disorder motivates us to suggest that the effective treatment with no side effects must be available for the beneficence of the society. In the present case, the Ayurvedic treatment protocol was found effective in the management of non-alcoholic fatty liver disease and obesity. The results observed in this case are encouraging and further well-designed clinical trials to test the efficacy of these interventions in similar conditions.

Declaration of patient consent: Authors certify that they have obtained patient consent form, where the patient given their consent for reporting the case along with the images and other clinical information in the journal. The patient understands that his name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Acknowledgement: Patient and its caregiver

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