## Review Article

# Non-alcoholic Fatty Liver Disease (NAFLD) in India : Challenges and the Ways Forward

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Non-alcoholic Fatty Liver Disease (NAFLD) is a distinct hepatic condition and one of the most common causes of Chronic Liver Disease globally. In February, 2021, the Government of India had launched and integrated interventions to prevent and control NAFLD in the ongoing National Programme for Prevention & Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS). This review was conducted to identify challenges and proposes solutions for effective program implementation. The authors identified that since NPCDCS has been implemented as District-based program and NAFLD being new component, the lack of familiarity of various sub-group of staff could be a major challenge in roll-out. The sensitization of Health Workers, Medical Officer in Primary Healthcare System, the specialist doctors at all levels of care as well as private practitioners, on various aspects of NAFLD (including epidemiology, clinical features, treatment approach and other aspects) should be conducted. The Information Education Communication (IEC) material should be developed and campaigns for awareness generation amongst general public in prevention and management of the disease should be conducted.Ongoing activities to set up Health and Wellness Centres under Ayushman Bharat Program, is a good opportunity to integrate of NAFLD in primary care level. This will help India to accelerate progress towards Universal Health Coverage.

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***Key words*** **: Ayushman Bharat Program, Chronic Liver Diseases, Health and Wellness Centres, Non-alcoholic Fatty Liver Disease, NPCDCS, Universal Health Coverage.**

Non-alcoholic Fatty Liver Disease (NAFLD) is an umbrella term for a range of Liver conditions and is a distinct hepatic condition and one of the most common causes of Chronic Liver Disease globally[1]. A healthy Liver should contain little or no fat. The main characteristic of NAFLD is excessive fat stored in liver cells (>5% of the Liver weight). The four stages of NAFLD described in Box 1[2].

In India, the prevalence NAFLD is estimated to be around 9-32% in the general Indian population with a higher incidence rate amongst Obese and Diabetic patient[3]. A large scale multicentric study from 101 Cities across India, found the overall prevalence of NAFLD at 56.5% among Type 2 Diabetes Mellitus (T2DM) patients aged between 25 to 84 years[4]. A wide spectrum of disease presentation from asymptomatic to Non-alcoholic Steatohepatitis (NASH) with or without Liver Cirrhosis and later into Hepatocellular Carcinoma (HCC) makes the disease a significant public health concern. About 3-15 per cent of the Obese Patients with NASH progress to Cirrhosis and about 4-27 per cent of NASH with Cirrhosis patients transform to HCC.The trends point that NAFLD will become the leading cause of End Stage Liver Disease (ESLD) ie, Cirrhosis and HCC[5]. In patients with NAFLD, the annual incidence of HCC is 1.8 cases per 1000 person-years (95% CI: 0.8-3.1) with overall mortality rate as 5.3 deaths per 1000 person-years (95% CI: 1.5-11.4)[6].

***Editor's Comment :***

- The Rising prevalence of Non-alcoholic Fatty Liver Diseases (NAFLD) is an identified public health problem for developing Countries such as India.
- NAFLD is preventable if identified early. Therefore, the integration of health services related to early identification, screening and community awareness should be prioritized.
- There is a need for high level commitment from all stakeholders for effectively integrating services for NAFLD into the primary level and up to the community level.

## Epidemiology of NAFLD :

The NAFLD has similar behavioural risk factors as other Non-communicable Diseases: Tobacco use, physical inactivity, Unhealthy diet including high intake of Salt, Sugar & Fats, HFSS, low intake of fruits & vegetables, harmful use of alcohol. NAFLD are usually the accidental finding of Ultrasound Sonography (USG) in patients presenting with dull aching abdominal pain,

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**Box 1 : Four stages of Non-alcoholic Fatty Liver Disease[2]**

- Simple Fatty Liver (steatosis) – a largely harmless build-up of fat in the Liver cells that may only be diagnosed during tests carried out for another reason
- Non-alcoholic Steatohepatitis (NASH) – a more serious form of NAFLD, where the Liver has become inflamed; this is estimated to affect up to 5% of the UK population
- Fibrosis – Where persistent inflammation causes scar tissue around the Liver and nearby blood vessels, but the Liver is still able to function normally
- Cirrhosis – The most severe stage, occurring after years of inflammation, where the Liver shrinks and becomes scarred and lumpy; this damage is permanent and can lead to Liver Failure (where your Liver stops working properly) and Liver Cancer.

extreme tiredness, weight loss and weakness.

The current recommendations to screen for NAFLD remain poorly defined and inconsistent. The EASL/ European Association for the Study of Diabetes (EASD)/European Association for the Study of Obesity (EASO) guidelines recommend screening in high-risk groups with metabolic risk factors[7]. The German[8] and UK[9] guidelines, incorporate clear algorithms for NAFLD routine screening in high-risk populations (eg, those with Type 2 Diabetes and Obesity). The American Association for the Study of Liver Diseases (AASLD) do not recommend routine screening in high-risk groups from primary care though acknowledge that the need for high suspicion of NAFLD and NASH in patients with T2DM.

The lack of consensus regarding the efficacy and/ or cost-effectiveness of systematic NAFLD screening among patients with Metabolic Syndrome conditions, eg, Obesity[10] and Diabetes[11] reduces the likelihood of recommendations being uniformly included in clinical guidelines or consistently adopted into practice.

## Challenges in NAFLD Prevention and Control :

India has the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) to tackle major NCDs[12]. The program covers a fairly broad range of diseases, however, the Non-alcoholic Fatty Liver Disease (NAFLD) have been included in the program only in February, 2021. Considering this is a new component to the program, one of the main challenges is likely to be the lack of familiarity of Community Healthcare Workers as well as Medical Officers in Primary Healthcare System about the NAFLD.

## The Ways Forward :

On 22 February, 2021, the Ministry of Health and Family Welfare, the Government of India integrated NAFLD in NPCDCS. This is a much awaited and the right step. However, going by the experience in the past, integration is an important step but not sufficient. More need to be done to ensure that program is effectively rolled-out at the ground[13].

The sensitization of Health Workers, Medical Officer in Primary Healthcare System, the Specialist Doctors at all levels of care as well as Private Practitioners, on various aspects of NAFLD (including epidemiology, clinical features, treatment approach and other aspects) should be conducted. The Information Education Communication (IEC) material should be developed and campaigns for awareness generation amongst general public in prevention and management of the disease should be conducted. Ongoing activities to set up Health and Wellness Centres under Ayushman Bharat Program, is a good opportunity to integrate of NAFLD in primary care level. With the introduction of Health and Wellness Centre (HWC) under Ayushman Bharat scheme nearly 150,000 Sub-Centres and Primary Health Centres would be transformed as Health & Wellness Centres by 2022 to provide comprehensive and quality primary care close to the Community while ensuring the principles of equity, affordability and universality[14].

The Government of India has announced the Pradhan Mantri Atmnirbhar Swasth Bharat Yojana (PMANSBY) in the Union Budget 2021-22[15]. One of the focus areas of this new scheme is to establish new HWCs in Urban Settings and Strengthen the infrastructure of Primary Healthcare facilities to be upgraded as HWCs. More specifically, the Urban India has some of the weak Urban Primary Healthcare infrastructure[16]. Therefore, the Urban Health will be scaled up, it is a great opportunity to integrate NAFLD in Urban Primary Healthcare Services. This is an opportunity integrate and scale up NAFLD specific interventions from the very beginning through following interventions (Indicative list) :

- Public awareness
- Screening for Fatty Liver Diseases (FLD) (Ultrasound / Fibroscan)
- Utilizing simple Non-invasive Biochemical

markers like ALT, AST/ALT Ratio and AST/ Platelet Count Ratio to detect Fibrosis among FLD cases

- Early detections and Weight Management strategies including lifestyle modifications (Dietary and Physical Activity)
- Not only Fat and Calories, but Carbohydrate should also be reduced in diet Interventions to prevent progression of FLD to CLD and Liver Cancer

The operationalization of NAFLD care through PHC System can be done by adding few information in Community Based Assessment Checklist (CBAC). The inclusion of appropriate questions and SOP development should be guided by expert groups. As an example, the ASHA worker to refer the same to Medical Officer for further evaluation. Also, at Auxiliary Nurse Midwife (ANM)/ Community Health Officer (CHO) level dietary history can be taken and per day consumption using 24-hour Dietary Method can be done. If increased intake of fat is noticed then history of raised total cholesterol questions from WHO STEP wise approach to surveillance can be used (Box 2)[17]. The treatment approach is listed in Box 3[13,18].

In cases with NASH with or without Cirrhosis/ HCC, the Tertiary Centre like Medical Colleges, AIIMS and Apex Institute has to play a significant role. Detailed investigations, staging and management plans to decrease the associated mortality or prolonging the survival rate with the Cirrhosis/ HCC should be main focus at Apex Centres. Also, capacity building, training of Medical Officers, General Physicians at the Private Healthcare setting to early detect the NAFLD can be done. A proper two-way referral system (from primary to secondary and back for follow-up care) should be in place and the ounce of responsibility for the same can be shared at different Healthcare settings.

The preventive and promotive interventions, under the NPCDCS are mostly to be delivered through Government system. However, considering a proportion of people seek curative services in Private Healthcare Facilities in India, the appropriate mechanisms for coordination and collaboration with private sector would be needed for increased access and availability of these services[19].

## Conclusion

The NFLAD has been integrated into NPCDCS in India. Early identification and prevention of complication ranges from Liver Cirrhosis to Hepatocellular Carcinoma can be done if NAFLD care is integrated at Primary Healthcare settings. Public Health awareness campaigns specifically including preventive aspects of Liver Disease should be conducted.The broader intervention such as those applicable to other NCDs are also applicable for prevention of NAFLD. Healthy habits in terms of food intake and physical activity are first-line approach to prevention and treatment of NAFLD. The next step is to make this functional integration and effectively roll-out. NAFLD is one condition which would require effective coordination at all levels and different stakeholders including private sector. The prevention and control of NAFLD is essential for overall Non-communicable Disease Prevention and Control in India. This will help increase access to additional services at affordable cost, to all people and help achieve the Universal Health Coverage in India.

## References


1 Abd El-Kader SM, El-Den Ashmawy EM — Non-alcoholic fatty liver disease: The diagnosis and management. *World J Hepatol* 2015; **7(6):** 846-58. doi:10.4254/wjh.v7.i6.846
2 Non-alcoholic fatty liver disease (NAFLD) [Internet]. nhs.uk. 2017 [cited 2021 Feb 2]. Available from: https://www.nhs.uk/conditions/non-alcoholic-fatty-liver-disease/
3 Kalra S, Vithalani M, Gulati G, Kulkarni CM, Kadam Y, Pallivathukkal J, *et al* — Study of prevalence of nonalcoholic fatty liver disease (NAFLD) in type 2 diabetes patients in India (SPRINT). *J Assoc Physicians India* 2013; **61:** 448-53.
4 Premnath M — Study of prevalence of nonalcoholic fatty liver disease (NAFLD) in type 2 diabetes patients in India (SPRINT). *J Assoc Physicians India* 2014; **62:** 651-2.
5 Dhamija E, Paul SB, Kedia S — Non-alcoholic fatty liver disease associated with hepatocellular carcinoma: An increasing concern. *Indian J Med Res* 2019; **149:** 9.
6 Bhadoria AS, Mishra S, Kant R, Nundy S — Fatty liver disease


**Box 2 : WHO Stepwise approach[17]**

- Have you ever had your Cholesterol (fat levels in your blood) measured by a Doctor or other Health worker?
- Have you ever been told by a Doctor or other Health Worker that you have raised Cholesterol?
- Were you first told in the past 12 months?
- In the past two weeks, have you taken any oral treatment (medication) for raised Total Cholesterol prescribed by a Doctor or other Health Worker?
- Have you ever seen a traditional healer for raised Cholesterol?
- Are you currently taking any herbal or traditional remedy for your raised Cholesterol?

Any response as **"yes"** then the person should be referred to a Medical Officer

**Box 3 : Management of NAFLD through continuum of care[13,18]**

The disease presentation for NAFLD is nonspecific. Nearly 40% of the NAFLD patients are asymptomatic. Among the symptomatic, two fifth present with obesity & easy fatigability, two fifth with pain in right upper quadrant of abdomen, 30% with acidity/ bloating or heartburn. A few with more than one symptom.

At PHC level, Medical Officers need to be trained in questions to be asked to the person came with above mentioned symptoms along with the history of Fatty Liver informed ever by a Doctor or deranged Liver Function Test. The patient should be examined for hepatomegaly/ splenomegaly, signs of jaundice. For further workup ie, USG abdomen the patient can be referred to Community Health Centre/ District Hospital as per availability.

At Community Health Centre other than USG abdomen, investigations such as the complete Liver Function Test, Lipid Profile, Tests for Chronic Viral Hepatitis can be done along with significant investigations applicable.

Among biochemical markers, 70% of patient will present with increased Alanine Aminotransferase (ALT), 40% with increased Gamma-glutamyl Transferase (GTT) & Indirect Bilirubin, 30% with high Triglycerides & Anti-nuclear Antibody (ANA) positivity and in 20% of cases abnormal iron indices can be seen. NAFLD patients have two to five times greater risk of developing Diabetes and hence screening for Type 2 Diabetes and other risk factors like Metabolic Syndrome, Polycystic Ovarian Disease, Hypothyroidism etc, should be done.

is a neglected non communicable disease in World Health Organization global action plan for prevention and control of non communicable diseases 2013–2020: A call for policy action. *J Med Evid* 2020; **1:** 75-7.

7 EASL–EASD–EASO Clinical Practice Guidelines for the management of non-alcoholic fatty liver disease - Journal of Hepatology [Internet]. [cited 2021 Feb 2]. Available from: https://www.journal-of-hepatology.eu/article/S0168-8278(15)00734-5/fulltext

8 Roeb E, Steffen HM, Bantel H, Baumann U, Canbay A, Demir M, *et al* — S2k-Leitlinie nicht alkoholische Fettlebererkrankungen. *Z Für Gastroenterol* 2015; **53(07):** 668-723.

9 Non-alcoholic fatty liver disease (NAFLD): summary of NICE guidance | The BMJ [Internet]. [cited 2021 Feb 2]. Available from: https://www.bmj.com/content/354/bmj.i4428

10 Blond E, Disse E, Cuerq C, Drai J, Valette P-J, Laville M, *et al* — EASL–EASD–EASO clinical practice guidelines for the management of non-alcoholic fatty liver disease in severely obese people: do they lead to over-referral? Diabetologia. 2017; **60(7):** 1218-22.

11 Byrne CD, Targher G. EASL–EASD–EASO Clinical Practice Guidelines for the management of non-alcoholic fatty liver disease: is universal screening appropriate? *Diabetologia* 2016; **59(6):** 1141-4.

12 Lahariya C, Mishra S, Daniel RA, Bhadoria AS, Mishra DK, Smith RD — How strengthened primary health care can contribute to the prevention and control of cardiovascular diseases in India? A narrative review. *J Med Evid* 2021.

13 Press Information Bureau Government of India. [Internet]. [cited 2021 Jan 25]. Available from https://pib.gov.in/PressReleseDetailm.aspx?PRID=1699904

14 Lahariya C— Ayushman Bharat program and universal health coverage in India. *Indian Pediatr* 2018; **55:** 495-506.

15 Press Information Bureau Government of India. [Internet]. [cited 2021 Jan 25]. Available from https://pib.gov.in/PressReleseDetail.aspx?PRID=1652976

16 Lahariya C — Health and wellness centers to strengthen primary health care in India: Concept, progress and ways forward. *Indian J Pediatr* 2020; **87:** 916-29.

17 World Health Organziation. NCDs | STEPwise approach to surveillance (STEPS) [Internet]. WHO. World Health Organization; [cited 2021 Mar 9]. Available from: http://www.who.int/ncds/surveillance/steps/en/

18 Operational Guidelines for the integration of Non-alcoholic Fatty Liver Disease (NAFLD) into NPCDCS [Internet]. [cited 2021 Mar 5]. Available from https://main.mohfw.gov.in/sites/default/files/OG%20print%20ready%20version%20_0.pdf

19 Lahariya C. Stronger government health subsystemis the way to advance universal health coverage in India. *J Med Evid* 2020; **1:** 133-7.