

## REVIEW ARTICLE

## Integration of Non Alcoholic Fatty Liver Diseases (NAFLD) into NPCDCS programme: A recent initiative in India

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### Abstract

Non-alcoholic fatty liver disease (NAFLD) is an emerging public health problem globally. NAFLD is one of the most common liver diseases worldwide and is the most common cause of abnormal liver enzymes in many developed countries. NAFLD is estimated to afflict approximately 1 billion individuals worldwide. An estimated 20-30 % of general population is afflicted from it globally. In India NAFLD could be a silent epidemic with its prevalence ranging from 9-32%. Studies have shown, strong association of NAFLD with major Non Communicable diseases (NCD) like Diabetes, Obesity, CVD, Chronic Kidney diseases, Cancers, etc. Perceiving the threat of NAFLD and the central role of hepatic accumulation of fat in the pathogenesis of other NCD, the Government of India (GoI) has taken steps to include NAFLD in the public health agenda. It has included it in the national NCD programme, i.e., National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) in 2021. India has become the first country in the world to start a national programme for preventive efforts for NAFLD. The present review describes public health relevance of NAFLD and the process of integration of Non Alcoholic Fatty Liver Diseases (NAFLD) into NPCDCS programme in India.

### Keywords

Non-Alcoholic Fatty Liver Diseases (NAFLD), NPCDCS, Diabetes Mellitus, PHC, CHC

### Introduction

Non-communicable diseases (NCDs) have emerged as one of the most important public health threats in the developing countries. (1). World Health organization (WHO) has broadly classified NCDs as cardiovascular diseases, chronic respiratory disease, diabetes and cancers. The major risk factors of NCDs are physical inactivity, unhealthy diet, tobacco use and excessive use of alcohol(2).

NCDs contribute to around 68% of all the deaths globally. The majority of NCD deaths occur in low and middle-income countries which are undergoing an epidemiological health transition owing to increase intake of foods high in calories, fats and salt, low physical activities, rapid urbanization etc. Further exacerbation is driven by the demographic transition that India faces, apprehended to lead to an 'ageing crises. India is

experiencing a rapid health transition with a rising burden of Non-Communicable Diseases (NCD) surpassing the burden of Communicable diseases like water-borne or vector borne diseases, TB, HIV, etc. (3)

The NCDs like Cardiovascular diseases (CVD), Cancer, Chronic Respiratory Diseases, Diabetes, Chronic Kidney diseases etc. are estimated to account for 60% of all deaths. NCDs leads considerable loss in potentially productive years of life. Losses due to premature deaths related to heart diseases, stroke and diabetes are also projected to increase in the country.(4) The proportion of hospitalizations of NCDs rose from 32% to 40% and outpatient consultations as a result of NCDs rose from 22% to 35% in a decade from 1995 to 2004. In macroeconomic term, most of the estimates suggest that the NCDs in India account for an economic burden in the range of 5–10% of GDP,(5) which is devastating for development of a country.

NAFLD is considered when there is a build-up of extra fat in liver cells that is not caused by alcohol. NAFLD may further lead to liver inflammation, liver fibrosis and cirrhosis, and liver cancer. It is normal for the liver to contain some amount of fat. However, if fat is more than 5% – 10% of the liver's weight, then it is a disease called as fatty liver (steatosis). (6.)

Non-alcoholic fatty liver disease (NAFLD) is estimated to afflict approximately 1 billion individuals worldwide. It is affecting 20-30 % of globally. NAFLD is prevalent in one out of every four individuals world-wide. In India, NAFLD is a silent epidemic with its prevalence ranging from 9-32% Evidence suggests strong association of NAFLD with major Non Communicable diseases (NCD) like Diabetes, Obesity, CVD, Chronic Kidney diseases, Cancers, etc.(7)

Considering the threat of NAFLD and the central role of hepatic accumulation of fat in the pathogenesis of other NCD, the government of India has integrated NAFLD in (NPCDCS) in 2021. India has become the first country in the world to include NAFLD in a national programme for preventive efforts for NAFLD.

Government of India (GoI) started responding to the challenges of NCD in 1975 by starting a vertical national programme which was renamed as NPCDCS in 2010 with a focus on i) strengthening infrastructure, ii) human resource development, iii) health promotion, iv) early diagnosis, management and v) referral(5). This was initiated in 100 districts of 21 states. In 2013-14, NPCDCS was integrated with National Health Mission (NHM). In 2018 a paradigm shift was made in NPCDCS by including comprehensive primary health care through Population Based Screening and utilising Health and Welfare Centres for providing NCD services.

The present review describes the process of integration of NAFLD into NPCDCS programme.

### Rationale - Integration NAFLD into NPCDCS

Liver plays a core role in metabolism and evidence suggests that NAFLD has a multi-dimensional association with sub-components of metabolic syndrome (obesity, Type II Diabetes Mellitus, dyslipidaemia, insulin resistance and hypertension).(8) [Figure 1] Nearly, 70- 90% of NAFLD patients have one or more components of metabolic syndrome. Moreover, NAFLD and metabolic syndrome both are an independent predictors of fibrosis.(9)

Metabolic syndrome, diabetes, obesity, mixed hyperlipidaemia and hypocholesterolaemia due to familial hypobetalipoproteinaemia are the major metabolic modifiers of NAFLD risk.(10). It has been suggested that if NAFLD can be prevented other NCDs may also be reduced. In view above Government of India(GoI) has included NAFLD in the national NPCDCS programme.

The operational guidelines have been developed for integration of NAFLD in the NPCDCS programme. The guidelines employ key public health strategies such as, health promotion, risk stratification, early diagnosis, and

prompt treatment. The strong foundation laid by these core principles is envisaged to target the entire spectrum of NAFLD through a continuum of prevention and cure.

The framework for interventions is based on the bottom-up approach, beginning in the community and culminating at specialized care. The anticipated target population for the care at each level is gauged as per the following cascade: It is suspected that total number of patients of NAFLD in a Primary Health Centre (PHC) serving a population of 30,000 could have 12600 in the age group of 30years and above. If we exclude 15% of Fatty liver subjects with other causes (viz. Hepatitis B, Hepatitis C, alcohol consumptions and other causes), the target population to be screened will be 10,710. Out of these 428 subjects may be required to be referred to Community health Centres for screening as they may have (4%) diabetes and obesity simultaneously. Half of 428 (i.e 214) cases referred are likely to have NAFLD. It is expected that 30 % of cases screened at CHC, i.e. 64 may have Non-Alcoholic Steatohepatitis (NASH), about 20% of NASH cases may develop cirrhosis (11). Also, 10% of NASH cases will develop Hepatocellular carcinoma (HCC) in later years, i.e 1-2 cases per PHC.

**1. Process of Integration of NAFLD and NPCDCS :** NAFLD and NPCDCS share same objective of: i) Health promotion through behavioural change, ii) Population based and opportunistic screening at all health care levels, iii)Prevention and control of chronic NCDs, iv) Capacity building for prevention, v) early diagnosis, treatment, rehabilitation, vi)Information Education and Communication / Behavioural Change Communication vii)and Operational Research, viii)Support diagnosis and cost-effective treatment at all levels. Integration of NAFLD with existing activity of NPCDCS has been undertaken without additional Technical, operational, financial and administrative cost.

#### 1.1 Dissemination of Concept of integration of NAFLD in NPCDCS and Gaining support of policy makers:

The first step of Integration of NAFLD into NPCDCS was undertaken with approval of NITI AAYOG, an highest body of Government of India's (GoI) policy decision body in a expert group meeting. It recommended that NAFLD may be added as a part of National program of NPCDCS. The development of algorithm for prevention, detection/diagnosis and treatment of NAFLD at different levels was approved. This strategy was endorsed by Ministry of Health and Family Welfare (MoHFW), GOI. The Operational Guidelines for the integration was developed by Ministry of Health and Family welfare (MOHFW) with support from Institute of Liver and Biliary Sciences(ILBS), National Health Services Resource Centres, other identified development partners.

**1.2 Sensitization of health care community, decision makers:** The second step was the sensitization of health care functionaries at various level along with decision makers in the field of health through a cascade model. A

series of national webinars have been conducted for building the capacity of key stakeholders such as medical college faculty and state medical officers. The sensitization of the state and district nodal officers of NPCDCS was done in order to enable them to seek support in their state budget for the diagnosis and treatment of NAFLD. The faculty in medical colleges and nursing colleges and the members of professional bodies of Public Health were oriented to the public health importance of NAFLD. The media campaigns were to be aligned with this common objective.

A webinar was conducted to develop the media plan and IEC integration and implementation of NAFLD into NPCDCS programme. MoHFW sent office memorandum to state Governments to organize activities for webinars, workshops, meetings at various levels in a phased manner.

### **1.3 Implementation Operational Guidelines at various levels of health care (Figure 2) :**

**1.3.1. Population based screening(PBS) :** Screening for the presence of common NCDs in persons of age 30 years and above, the prevention, control and screening services will be conducted through trained frontline workers, Accredited Social Health Activist (ASHA) and Auxiliary nurse midwife (ANM). This will be linked with referral support system and continuity of health care. This will be implemented in 480 districts and Health and Wellness Centres as a part of comprehensive primary health care. PBS will facilitate the better management of diseases through detection in early stage, follow up and treatment adherence. It is first point of contact of population with health care therefore it will also help in awareness generation for the risk factors of NCDs to the population.

**1.3.2. Sub-center level activities** -Under NPCDCS activities such as health promotion activities screening of common NCDs and validation of all high risk individuals will be done by ANM through community based assessment checklist for abdominal obesity through BMI app of ASHA. History of gall-stone, liver diseases and cancer related information will also be collected and a score will be generated using these parameters and suspected patients will be referred and reported to Primary Health (PHC) for further diagnosis and management of NCDs

**1.3.3. Primary Health Care(PHC) activities :** Under NPCDCS at PHC opportunistic screening for common NCDs along with health promotion activities will be conducted. Medical officer will diagnose and facilitate management of common NCDs either of patients referred by ANM through PBS or direct/through OPD. NAFLD suspects identified following examination of patient will be referred to CHC for further diagnosis and confirmation of NAFLD and evaluation of advanced liver fibrosis and treatment thereof.

**1.3.4. Community Health Center (CHC) level :** Medical Officer (MO) at CHC, diagnoses and manages common

NCDs of patients referred through PBS or arriving directly at CHC. With respect to NAFLD, CHC-MO will perform clinical examination to rule out other causes of chronic liver diseases based on history, examination, investigations such as Ultrasound (USG), Liver Function Test (LFT), Complete Blood Count (CBC), age, body Mass Index(BMI) etc. Two simple, easy to use and accessible non-invasive risk scores will be calculated for risk stratification for advanced liver fibrosis. The findings will be entered in application for the calculation of Fibrosis 4 score (FIB 4) and NAFLD Fibrosis Score (NFS). This app will calculate scores for the risk stratification into “High risk”, “Intermediate risk” and “low risk”, for advanced liver fibrosis, which will guide the management or referral of patients accordingly.

**1.3.5. District level activities:** Medical Officer at the district hospital manages patients for common NCDs and its complications. Those referred through PBS/PHC/CHC as well as those patients reaching directly to the district hospital. Both outpatient (OPD) and inpatient (IPD) care is provided for NCDs. In addition to these activities, few additions will be made to take care of the burden of NAFLD, such as Management of NAFLD referral, risk stratification for advanced liver fibrosis if facility for the same is not available at CHC. For patients with indeterminate risk of advanced liver fibrosis, Fibro scan will be performed. Capacity Building of health care functionaries will be planned for the same. The Health promotion activities, opportunistic screening and IEC activities already going on for NCDs will be strengthened with NAFLD. At district hospital low risk patients will be referred back to PHC for management of diabetes, dyslipidemia, hypertension and weight reduction. They will also refer patients to the tertiary care centre for complicated cases or if facilities will not be available at District Hospital.

## **2. Road Ahead:**

**2.1. The integration of NAFLD** into NPCDCS is being undertaken from centre to periphery level through PHC, CHC, district level and state level. NAFLD component of NPCDCS will be prioritized through media plan, sensitization workshops etc Healthy behaviours will be promoted to modify lifestyle behaviour change for prevention and control of NAFLD. “Eat right Campaign” and “Fit India Campaign” which promotes “right eating, right exercising are likely to be utilised for promoting healthy Liver.”

**2.2. Capacity building at various levels** would be developed in a cascade manner. An effort should be taken for capacity building with the help of a well-designed training plan and programme for the identified health functionaries at different levels of the healthcare delivery system. Proper training needs assessment are likely to be carried out and accordingly a training plan, programme and a calendar would be worked out.

**2.3. Design and dissemination of Information Education and Communication (IEC):** Promoting healthy behaviors to modify lifestyle, behavior change, is critical for prevention and control of NAFLD. States have been requested to develop context specific strategies for lifestyle modification and for promoting healthy behaviors for primary prevention. Strategies would be developed to target at individuals, families, and communities. States have been requested to develop an Integrated health promotion strategy which envisages convergence, multitasking and pooling of resources from various programmes. IEC messages would aim at increasing awareness on risk factors of NAFLD, healthy lifestyle and benefits of screening.

**2.4. Monitoring through Program Implementation Plan (PIP):** Regular monitoring and review of the scheme are will be conducted at the District, State and Central level through monitoring formats and periodic visits and review meetings by GOI, NCD Division at different levels of health care will supervise and monitor the NPCDCS programme. The evaluation of the programme will be carried out concurrently and periodically

**2.5. Continuum of health care** in all phases of life is has been integrated for the prevention of NAFLD starting from early childhood to adolescent, adults and elderly. The Government of India (GoI) has already programmes focusing on different stages of life to provide continuum of health care starting from Rashtriya Bal Swasthya Karyakram, School Health Programme, Rashtriya Kishore SwasthyaKaryakram, National Programme for Elderly. All these will be utilized for continuum of health care. An effort should be taken to enhanced awareness among mothers and children on NAFLD will be undertaken through Reproductive and child Health for primordial prevention of NAFLD through health education.

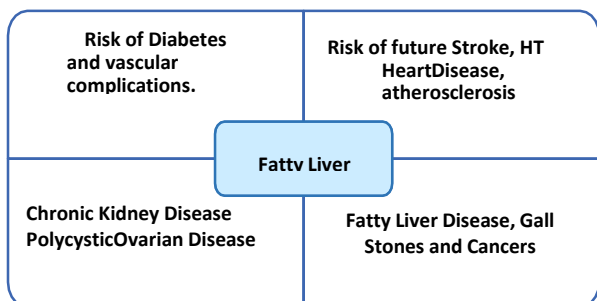
**2.6 An effort should be made** by GoI to develop National and Regional centres of excellence for implementation of Integration of NAFLD under NPCDCS.

**Relevance of the study**

This review gives insight in public health relevance of NAFLD and the recent initiative of GoI of integration NAFLD into NPCDCS programme.

**Figures**

**FIGURE 1 LIVER IS AT CORE OF METABOLIC DISORDERS.**



**Authors Contribution**

All authors have contributed equally.

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**FIGURE 2 POPULATION BASED SCREENING FOR NAFLD IN INDIA.**

