Incidence and Early Detection of Patients with Nonalcoholic Fatty Liver Disease Referred to the Gastroenterology Clinic: A QI Project

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Introduction

Non-Alcoholic Fatty liver disease is under-recognized in Primary care clinics. Patients with Non-alcoholic fatty liver disease are predisposed to Liver Cirrhosis and Cancer in the long Term. Early diagnosis in Primary care clinics is essential to help understand the magnitude of the burden and initiate measures to prevent its silent progression. With the rising incidence of NAFLD, it will soon become a major health care burden in the future.

AIM

We aim to establish a screening algorithm for early detection of non-alcoholic fatty liver disease (NAFLD) in Primary care clinics and educate patients on primary preventive measures to avoid the development of cirrhosis from fatty liver.

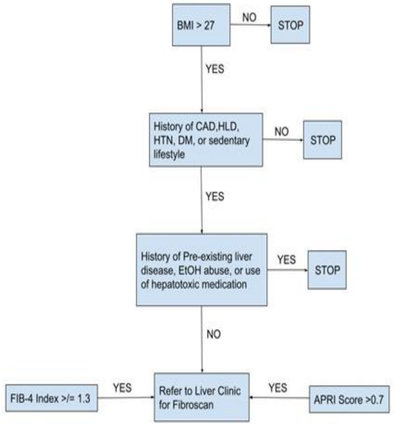

Figure 1: Pre-existing Liver Disease includes Hepatitis, Wilson's, Hemochromatosis, Malignancy
EtOH abuse defined as: > 1 drink/day or >7 drinks/week in females, > 2 drinks/day or > 14 drinks/week in males
Hepatotoxic medications include Allopurinol, Amiodarone, Amoxicillin-clavulanate , Anabolic steroids, Atorvastatin, Azathioprine/6-Mercaptopurine, Busulfan, Carbamazepine, Chlorpromazine, Contraceptives, Dantrolene, Diclofenac, Didanosine, Disulfiram,

Methods and Materials

•We created an algorithm that was tested in a cohort of patients recruited from the primary care center and the inpatient settings of the hospital. (Figure 1) We created a fishbone diagram to help the screening algorithm which served as the foundation of the study. The fishbone diagram evolved to meet the needs and challenges faced in our Primary care Clinic. (Figure 2)

•Inclusion criteria were: Presence of established Type two diabetes Mellitus (T2DM).Components of metabolic syndrome like hypertension and dyslipidemia, Elevated aspartate aminotransferase (AST) or alanine aminotransferase (ALT) levels or history of fatty liver by any imaging modality.

• Exclusion criteria were: Other causes of chronic liver disease.

•Clinical and demographic data collected were age, sex, BMI, comorbidities, and laboratory parameters to calculate Fibrosis-4 and AST to Platelet Ratio Index (APRI) Scores.

•Patients with Fibrosis-4 score greater than 1.3 and APRI score greater than 0.7 were referred to a gastroenterology clinic for Liver Elastography (Fibroscan).

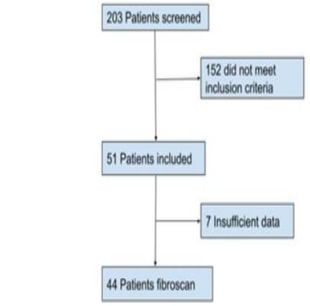

Figure 2: The flowchart of patient selection. Of 203 patients screened at our hospital, 152 patients did not meet inclusion criteria and were excluded at baseline. 51 patients were included. 7 patients out of them had insufficient data. The final analysis sample of 44 patients underwent fibroscan

Results

•Between August 2020 and October 2021, 203 patients were screened in the primary care clinic for NAFLD. (Figure 3)

•A total of 51 patients met the inclusion and exclusion criteria.

•A total of 7 people, 13% had insufficient data.

•The median age in our study was 60 years, with 22 (50%) males.

•In terms of comorbidities, 52 % had T2DM, 77 % had hypertension, 52 % had hyperlipidemia, and the median for the BMI over 30.9.

•75% of our patients had an APRI score of less than 0.7, 9% had an APRI score between 0.7 and 0.99, and 16% had an APRI score of > 1.

•The FIB-4 index was divided into three categories.

•Half of our patients had a FIB-4 index of less than 1.45, 34% of our patients had their FIB-4 index ranges between 1.45 and 3.25 and the remaining 16% had a FIB-4 index of more than 3.25.

•Of those patients, a total of 26 patients had a Liver Elastography to determine the stage. The Kpa ranges between 5.3-7.2 and the CPA ranges between 246 and 361 dB/m. (Figure 4)

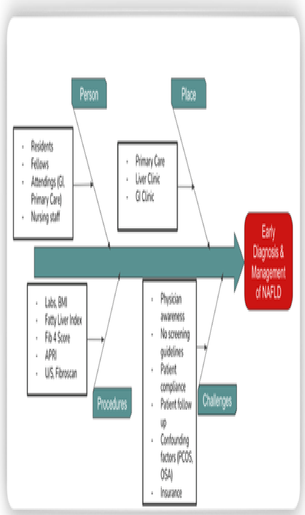

Figure 3. Fishbone diagram

Demographics	Total Patients (44)
Male, N (%)	22 (50)
Age, (Median, IQR)	60, (54.5- 68)
BMI, Median (IQR)	30.9, (27.97- 35.08)
Comorbidities	
Hypertension N, (%)	34, (77)
Diabetes N, (%)	23, (52)
Dyslipidemia N, (%)	23, (52)
Laboratory Parameters	
Aspartate Aminotransferase- U/L, (Median, IQR)	28 (19- 37)
Alanine Aminotransferase- U/L, (Median, IQR)	27 (21- 44)
Fibrosis Lab assessment	
FIB4 %(<1.45, 1.45- 3.25, >3.25)	50, 34,16
APRI % (<0.7, 0.7- 0.99, >1)	75, 9, 16

Figure 4. Demographics and Results

Discussion

Health care costs for NAFLD patients compared to controls were 80% higher in a study conducted by Allen Et al.. The highest healthcare costs were for imaging, biopsies, and hospitalizations. (1) NAFLD is asymptomatic and silent in the early stages when patients are visiting primary care. Therefore, it is necessary to screen the patient population early to reduce the costs and develop methods to correctly tackle this disease. Educating primary care physicians on screening tools and encouraging referral to gastro hepatology specialty care when relevant is necessary.

It is predicted that NAFLD-related liver cirrhosis will increase by 168 % , liver cancer by 137 % and mortality by 178 %) by 2030. (2) . It is also necessary to take steps to diagnose and treat metabolic syndromes that cause and accelerate the progression of NAFLD. In our study, we observed a spectrum of NAFLD manifestations from early disease to stage 3 fibrosis of the liver. Patients in the early stages of the disease with comorbidities were counseled on healthy lifestyle practices.

Patients with severe disease at diagnosis will require aggressive risk factor reduction. These patients also need to be referred to Gasto hepatology. Some patients with normal ALT levels had NAFLD on imaging can be missed if we didn't do a fibro scan and GI referral, FIB-4 and APRI score worked as an accurate screening tool.

Step-wise Algorithms need to be further researched and developed for screening patients by health care providers who need to work in close collaboration with gastro hepatology clinics for patient compliance. Liver biopsy though a gold standard is not a feasible screening approach currently but may be in the future. Until then we need to develop a non-invasive pathway to screening. (3)

Conclusions

This study demonstrates that a stepwise prospective application of an algorithm using inclusion and exclusion criteria in clinical practice settings can lead to increased awareness and therefore the early identification of patients with NAFLD. Further studies on implementation in larger size populations are needed along with education and long-term management

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