INTRODUCTION

Diabetes mellitus is one of the most common non-communicable epidemics ruining the world. India has become the diabetic capital with a maximum number of cases. Nutritional management of diabetes mellitus plays an important role in the control of the disease. There are many complications associated with the disease as it progresses over years. The duration of diabetes increases the incidence of its associated complications. Non-alcoholic fatty liver disease (NAFLD) is emerging as a new entity with changing lifestyles. The combination of NAFLD with pre-existing dietary modifications for diabetes mellitus (DM) pushes the attending dietician in a fix regarding the modification of diet to arrest the progress of the liver disease. In this narrative review, we have tried to address the dietary factors which may influence a combined illness.

The genesis of NAFLD in DM

NAFLD is hepatic steatosis: There should be macrovesicular steatosis in &gt;5% of hepatocytes: There should not be any secondary cause of steatosis. The prevalence of NAFLD is around 60%. The most important health problem associated with it is the progression of NAFLD to non-alcoholic steatohepatitis and further to cirrhosis and hepatic cellular carcinoma. The presence of DM worsens the progress of NAFLD and the vice versa is also true and both being proved on a scientific basis beyond doubt. The unexplained interactions between NAFLD, visceral adiposity and insulin resistance thereby its close association with DM is still being explored by scientists. NAFLD disease per se depends on so many factors like genetic predisposition, ethnicity, age, gender, and metabolic status. Recently a few gene variants have been described where the prevalence of the disease is found to be significantly higher than those who don’t possess that
There are some studies which state that artificially
Growing egg white, pulses are a few protein
Certain types
On a miscellaneous note, bitter
To be clear and concise, the carbohydrates should be
This part may be due to their
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Regular
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Oligofructose supplementation decreases
Citrus fruits, green leafy rich foods and nuts can be
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weeks in obese 132 Taiwanese participants.\textsuperscript{17} The weight reduction was more than 10% and the enzyme improvement showed 41% and 50% in 450 and 800 calorie groups. Exactly how far this VLCD is clinically practical in patients with normal lifestyle is to be explored. Hence a low-calorie diet of 1400 kcal/ day is easily feasible and achieves the needed in a sufficient period. There should be complete abstinence from alcoholic beverages. The dietary pattern should be spread over a five to six meal times and each meal should be taken slowly over some time but not in haste.\textsuperscript{18}

### Table 1: Menu with alternate recipes for VLCD in a case of DM with NAFLD

| Plan menu 1 | Morning | Breakfast | Lunch | Evening | Dinner |
|-------------|---------|-----------|--------|---------|--------|
| 500 – 600 Kcal | Green tea without sugar, walnuts 2 | 2 idlis with onion chutney | Half katorie rice with dhal, Green leafy vegetables, tomato raita | Apple + Green tea | 2 chappathi in olive oil Garlic chutney |
| Plan menu 2 | Black coffee with chicory with minimal milk without sugar | Ragi adai or Ragi dosa 2 in number | Varagu rice pulav 3/4 th katorie | Avocado | Rice-flake uppuma 1/2 katorie + buttermilk 100ml |
| 500-600 Kcal | Carrot juice | Fenugreek dosa 2 – medium size Garlic chutney | Kuthirai vali pulav ¾ th katorie. Pulses / cooked ground nuts – 100 grams -unfried | Beans, | vegetable salad + coconut water |
| Plan menu 3 | Mushroom soup Or Bermuda grass juice | Baked fish (2 pieces) with tomato or Salmon with spinach | 2 hard-boiled eggs, vegetable salad | Barley soup | Vegetable oil khichdi Onion raiti |
| 600 - 700Kcal. | 40 | 120 | 250 | 100 | 150 |
| Plan menu – 4 | Sesame baked tofu (soy)with Broccoli salad | Cucumber pepper rice – ¾ katorie Cabbage steamed 100 grams | Guava fruit 2 in number or Jamun fruit 8-10 | Two roti/ Phulka/ wheat paratha Sprouted green gram dhal gravy |
| 500-600Kcal | Dilute milk with chicory coffee Or watermelon juice | 150 | 200 | 50 | 150 |
| Plan menu 5 | 40 | 120 | 140 | 80 | 250 |

The menu described is for complete restriction to VLCD so that the calorie intake is around 600 calories. Addition of intake in the number of dosa, idlis or chapathi can be done to increase the calorific value to 1500 calories. The value-added nutrition in the form of ragi biscuits, bitter gourd pakodas can be added to facilitate control of DM along with regression of NAFLD. The total calorie intake can be easily adjusted from the above described according to the needs of the patient. The diet will vary with patients’ age, sex, weight and physical activity.

### CONCLUSION

In patients with combined DM and NAFLD, a strict but cautious calorie restriction with a 10 % weight reduction is more beneficial for the latter. Intake of whole grains, nuts and fibre rich food is good for both. Garlic with oligofructose, chicory, avocados and tofu are liver-friendly dishes. A well-planned dietary pattern with adequate nutritious energy-producing foods but with fewer calories are advised to contain the dreaded combination of two diseases.

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