

Diet and Non-Alcoholic Steatohepatitis

Paul Clayton*

Clinical Pharmacologist and Pharmaco-Nutritionist, United Kingdom

***Corresponding Author:** Paul Clayton, Clinical Pharmacologist and Pharmaco-Nutritionist, United Kingdom.

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If you are not yet convinced that the modern diet is degrading and shortening our lives, consider your liver. As waistlines expand, so does the incidence of non-alcoholic liver disease (NAFLD). Thanks to our modern diet and lifestyle, NAFLD is now reckoned to affect an astonishing quarter of the entire population of the world [1].

During the next decade non-alcoholic steatohepatitis (NASH), a sequel of NAFLD, is projected to increase by up to 56% [1,2]; and as NAFLD and NASH are the most rapidly growing causes of hepatocellular carcinoma in many countries [1,2], liver cancer driven by these factors is projected to double in the same time period.

There are not enough livers to transplant into all who need them, and not enough surgical teams. Transplants are not an ideal answer in any case, and come with a range of serious problems. It would be better if we could identify the factors driving the numbers up and neutralize them; or at least diagnose the condition early enough to implement preventative measures.

Overweight, obesity, metabolic syndrome and Type 2 diabetes are the principle and over-lapping risk factors.

Body shape and liver enzyme tests are the main diagnostics. However, between 10 and 15% of adults with normal bodyweight have 'lean NAFLD' [3-6], and as yet unknown number have 'lean NASH' [7,8], which contributes to a significant degree of under-diagnosis. This means that many progress to liver cancer (and heart disease) who should have been headed off at the pass.

From a public health perspective, and given the progressive nature of this kind of liver disease [9], it would be better to focus on prevention and enhanced awareness.

If overweight folks and Type 2 diabetics want to preserve their livers they must lose weight and regain glycemic control. There are plenty of ways of doing this. Weight loss of circa 10% is widely recommended, as is physical exercise [10]. Low-carb and ketogenic diets are also helpful [11-13]. Type 1 diabetics cannot reverse their condition but are significantly less at risk [14-16].

If you are normal weight and non-diabetic you may still have a problem; and if you are experiencing fatigue, nausea, loss of appetite and weight loss, together with pain or discomfort in the upper right abdomen, swelling of the abdomen and/or legs, enlarged capillaries, enlarged spleen, red palms and/or yellowing of the skin and eyes, you should definitely go for screening.

However, the majority of cases of NAFLD are asymptomatic, and given that 1 in 4 of us have this condition, it is just as well that there is more that we can do to protect ourselves. It is all about diet and lifestyle. And diet.

The accumulation of fats in the liver is a key driver of NAFLD. In descending order of importance these fats derive from lipids released from adipocytes elsewhere in the body, endogenous lipogenesis from dietary carbs, which is accelerated by hyperinsulinaemia [17-19], and from dietary fats [20].

The first mechanism can be modified, but is not a logical target as it is essential for weight loss. Endogenous lipogenesis is reduced by low carb diets and improved insulin sensitivity, hence the benefits of carb restriction [11-13, 21-25] and physical exercise [10, 26], preferably in combination [27]. This is a healthy combination in non-diabetics too.

Sugar restriction seems to be particularly important [28-31]. A Swiss group recently showed that consuming quite modest daily amounts (80 g) of fructose or sucrose (50% of which is fructose) increased lipid formation in the liver by 100% [30]. Due to the excessive amounts of sugar and high fructose corn syrup in ultra-processed foods, most people consume over 100 g of total sugars per day [ie 31-33].

The situation with dietary fats is somewhat unclear.

There is, however, a rationale for cutting back on omega 6 plant oils and increasing intakes of fish oil and extra virgin olive oil, which exert protective effects via anti-inflammatory and other mechanisms [34-38]. You should add prebiotic fibers, which prevent pro-inflammatory lipopolysaccharides flooding into the liver from a dysbiotic gut [39-40].

If you think this sounds like an advertisement for the Mediterranean diet, you're right. The Med diet is indeed protective against NAFLD [41-48]. Conversely, the ultra-processed diet, packed with fats, sugars and calories but low in prebiotic fiber and all the protective phytonutrients, makes NAFLD more likely [49-50].

The modern diet, by creating the toxic tetrad of chronic inflammation, type B malnutrition, dysbiosis and glycemic overload, creates the perfect hepatic storm, which is exacerbated by our low levels of physical activity.

This profoundly pathogenic combination generates insulin resistance, lipid infiltration, mitochondrial dysfunction, inflammatory stress, endoplasmic reticulum stress, endotoxaemia and other problems. This explains exactly why a quarter of the world's population now have liver disease – and why all the non-communicable degenerative diseases have become so prevalent.

There is a proliferation of research into the machinery of NAFLD and its progression and a multitude of potential targets for magic pharmaceutical bullets. These will come with all the usual problems of cost and toxicity and be completely unsuitable for prophylactic or public health use. Drug combinations, which will be necessary because the network of pathogenic vectors that culminate in the NAFLD syndrome has so many strands, will be even more problematic.

In the greater scheme of things, the food multinationals must be brought to heel. The chemical warfare they are waging against us is intolerable, and their profits are blood money. While waiting (cue the elevator muzak), here are a few simple things you can do to revert to pre-transitional nutrition and heal yourself.

Stop buying ultra-processed foods. Learn to use and cook with basic produce. Bio-hackers can alternatively use the Health Protocol, which counters three of the major disease vectors. Add low carb plus a little physical activity to counter the fourth.

If you are unwilling or unable to be physically more active, there may be a hack for that too.

The hepato-protective effects of exercise are mediated via increased insulin sensitivity and the up-regulation of autophagy. The herb *Gynostemma pentaphyllum* contains dammarane saponins which induce AMP-Kinase phosphorylation and therefore improved insulin sensitivity and a physiological level of autophagy. They protect against NAFLD in pre-clinical models with secondary improvements in the microbiome. Evidence is emerging of efficacy in clinical NAFLD as well.

Gynostemma pentaphyllum ('Jiaogulan') is well known in traditional Chinese medicine, and has been used for centuries to treat frailty, obesity and diabetes. It has an excellent safety profile; the plant is easy to grow and you can make up a tisane in minutes. I prefer to work with standardized and validated extracts such as Activ Amp.

I generally combine it with betaine, an atypical amino acid and a waste product of sugar beet processing. Betaine is also known as trimethyl glycine, but many researchers who study this compound and understand its importance refer to it as vitamin B10.

Betaine is a methyl group donor, an osmoprotectant and a chaperone compound. It is vital for the health and function of the liver and reverses the progression of preclinical models of NAFLD. It down-regulates genes involved in endogenous lipogenesis and encourages lipid removal from the liver, probably by facilitating hepatic phospholipid synthesis.

The actions of this interesting molecule are broadly similar in all higher life forms studied to date, and there is no reason to believe that humans are any different. The fact that betaine has not yet been adequately clinically trialled, illustrates the bias in research funding, and the disinclination of the pharma industry to allow safe, natural and inexpensive compounds to compete with their toxic and over-priced products.

And the foie gras?

In my last year of school I worked a summer job on a Périgord farm. Those geese came running whenever Mme Cambronne called them to be funnel-fed, and would push each other aside to get to the front of the line. Far from being traumatized by the process they clearly enjoyed it, even if they might not have relished the idea of conjoining, finally, with toasted brioche and Jurançon.

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