

Fatty Liver

Fatty liver is also called Non-alcoholic Fatty liver Disease (NAFLD). It has become the most common chronic disease in the USA, affecting one in three people (in the UK the figure is close to 30% of adults and worryingly 20% of all children). It is closely linked with obesity, diabetes and especially with metabolic syndrome (see separate leaflet).

It is normally diagnosed with a liver scan. Blood tests typically show raised liver enzymes. It is generally benign but in one in six cases can go on to a more serious condition called non-alcoholic steatohepatitis (NASH) where inflammation, scarring and fibrosis are found in the liver. About 5-10% of patient with NASH develop cirrhosis.

Two studies shed an interesting light on this condition. In a Swedish study, a group of volunteers deliberately ate two fast food meals daily and had their liver enzymes monitored. At the onset their blood tests were normal. After one week 75% had abnormal liver enzymes suggesting they were developing liver damage within one week.

In a second study, the SUCRE controlled trial, a group aged between 9 and 19 years old were investigated. They found 25 out of the 42 already had signs of fatty liver. They were put on two diets of equal calories, one with sugar and one without. Those on the sugar-free diet reduced their liver fat by 29% over the 10 days, their fasting insulin went down 10% and triglycerides were halved whereas those taking sugar did not.

This result was ground-breaking. It demonstrated that **it was not calories but sugar that was responsible for fatty liver** (and diabetes).

What strikes me about both these studies is how quickly the liver can be damaged by sugar and junk food and, on a more positive note, how quickly it can heal on a healthy diet. Sugar is half glucose and half fructose but whereas glucose can be broken down anywhere in the body, 90% of fructose is broken down in the liver and the liver is easily overloaded by too much fructose.

There is another aspect to this story. Elevated uric acid is linked with fatty liver. People tend to associate high uric acid with gout but it is also part

of the metabolic pathway of fructose. In other words too much fructose increases uric acid. Strategies to reduce uric acid can help with fatty liver. Perhaps the most important part is cutting out fructose but reducing purines and alcohol can also help (see gout leaflet). Quercetin helps to get rid of uric acid as does the drug allopurinol. It is worth checking uric acid if you have fatty liver.

However, here is another crucial study which helps us understand fatty liver. In this **ground-breaking study** mice were fed them either chow, (a rodent feed made from ground wheat with fish and animal products) 4% soybean oil or 19% soybean oil. Those fed chow had no problems. Those fed 4% soybean oil developed fatty liver at 36 weeks. Those 19% soybean oil developed fatty liver at 19 weeks and severe liver damage at 36 weeks. What does this mean? It means that **soybean oils (and other processed oils) are a major cause of fatty liver.**

Vegetable oils are everywhere; they make up 32% of the calories in the standard western diet (sugar 22%). Soybean oils were responsible for 0.02% of calories in 1909 but 20% by 2000. They cause 9% more weight gain than fructose. They have no nutritional value and a worrying number of harmful effects (weight gain, diabetes, heart disease, increased mortality). They are amongst the most damaging foods we can eat. One of the best things you could do for your health is avoiding processed foods (which virtually all contain these oils) and avoid highly-processed cooking oils like sunflower, soybean, safflower, rapeseed (also called canola) and corn oils. Cook in butter, lard (or good quality olive oil) instead.

The best diet for NAFDL is one with little or none of the foods which convert into sugar, such as refined carbohydrates (white flour, most bread, white rice, cooked potatoes and processed foods) but even more important a diet with no sugar (or to be more specific no fructose - 50% of sugar is fructose). High-fructose corn syrup, which is present in almost all processed food, contains more fructose than sugar (55%). **Sugar, high-fructose corn syrup and industrial oils are the major drivers for this disease.** One study found 80% of people with NAFL were taking high fructose corn syrup and 30% were taking it daily.

Unlike other sugars, such as glucose, fructose can only be broken down in the liver, and once the liver is overloaded with fructose it starts to malfunction.

A more detailed version of the dietary changes for fatty liver can be found on the leaflet on metabolic syndrome. The first and essential step is stopping sugar and high-fructose corn syrup. The second step is reducing refined carbohydrates and diet drinks. Eating plenty of fruit and vegetables whilst reducing meat and dairy, avoiding snacking, having a long gap between the last food in the day and first in the morning (ideally over 12 hours) and exercising more can also help.

Toxicity is a further but little recognised factor in fatty liver. In recent years up to 123 chemicals such as PCBs, BPAs, phthalates, dioxins, cadmium and perfluorinated chemicals have been implicated in the recently-recognised syndromes TAFLD (toxicant-induced non-alcoholic fatty liver) and TASH (toxicant-induced non-alcoholic steatohepatitis). Many of these are commonly-used chemicals found in plastics, food, clothing and packaging. Some widely-prescribed drugs such as steroids, amiodarone, tamoxifen and diltiazem have also been implicated.

There is fascinating and disturbing data from the Anniston Community Health Survey. This is a Community in the USA living downwind of a former Monsanto facility that has been exposed to high levels of PCBs heavy metals and other pollutants. Residents have a two to three-fold increase in PCBs in their bodies. They have a 27% higher risk of diabetes, 54% higher risk of diabetes and a 60% higher risk of liver disease. (These liver diseases are TAFLD and TASH).

One study showed that rats exposed to the weed killer, glyphosphate (Roundup), at a dose which was a staggering 5000 times below than safety limit developed fatty liver. Many of our crops, especially wheat are contaminated with traces of glyphosphate.

With fatty liver it makes absolute sense to reduce your exposure to chemicals and use basic detoxification procedures (see toxicity leaflet).

A study in 2016 found that giving chlorella (300mg daily) improved fatty liver, reduced liver enzymes, improved lipid profiles and led to weight loss (Clin Nutr, 2016; 36(4): 1001-06).