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The Liver and Autism

The liver is one of the most important organs within the body....

We have all read about the issues regarding poor detoxification mechanisms in autistics and apart from improving the status of reduced glutathione, trans-sulfation and methylation and providing the co-factors that fire the main liver enzymes, an overall approach to identifying liver stress in your child and aiding its function is imperative.

I have seen many children in clinic with chronic dysbiosis, permeability of the gut membrane, diarrhoea and constipation. Remember all toxins are passed via the gastro-intestinal (GI) tract into the hepatic portal vein and carried to the liver for nutrient processing and toxin elimination. Therefore if your child has the aforementioned symptoms then there will be an increased exposure to toxins, coupled

with an inability to naturally detoxify when your child becomes toxic.

A burden of biotoxins, neurotoxins, heavy metals and immune dysfunction are common issues and therefore need to be addressed especially if the natural immune cells (kupfer) within the liver become overburdened.

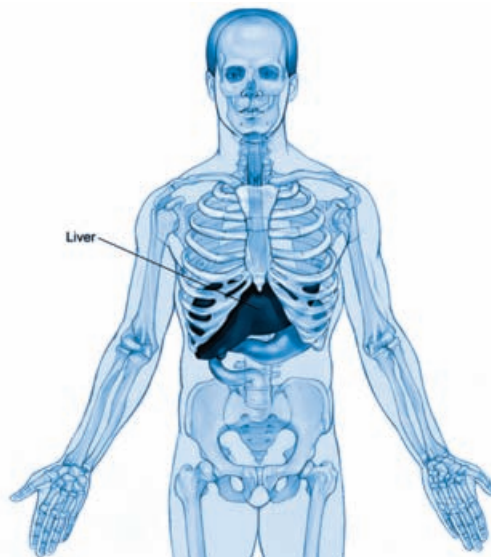
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The liver's functions are threefold:

- secretory in that it secretes bile;
- vascular in that it stores blood and filters one quart per minute, cleansing the blood of bacteria, endotoxins, antigen-antibody complexes, and numerous other particles and toxins; and
- metabolic through its many functions involved in the utilisation of fats, carbohydrates and proteins.

The liver not only repackages nutrients but also plays significant roles in immune health: it acts as both an endocrine and exocrine gland that produces and releases hormones; it breaks down toxins ready for elimination; and manufactures protein structures for hormones, neurotransmitters and human protein forms. It is therefore vital for overall health and functionality.

The liver also aids digestion by secreting bile which helps digest fats. How many of our autistic children have pale coloured, frothy and floating stools? Bile is also important in preventing constipation, candidiasis, and helps provide the correct environmental pH for beneficial gut flora to



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flourish. Bile also helps reduce food allergy and food sensitivities and transports toxins out of the liver into the gall bladder for elimination via the gut. Some symptoms of liver stress include dark eye circles under the eyes, white fatty deposits beneath the eyes and under the skin and other skin issues such as eczema and dermatitis.

The liver takes amino acids from the diet as a result of protein digestion and forms them into protein structures that support regeneration of hair, muscle, blood vessels, cell membranes, immune proteins such as immunoglobulins, hormones such as insulin and adrenalin, and neurotransmitters such as serotonin. It helps eliminate bad fats and makes Vitamin D. It stores Vitamins A, B (especially B12) and E and some minerals.

Let us consider in brief what 'toxins' are: quite simply they are foreign molecules including 'free radicals' or reactive oxygen species that play no favourable role in the human body. For good health they need to be eliminated. The liver plays a pivotal role here, probably the most important detoxifying role in the human system.

To aid in reducing toxic exposure to and the burden on the liver it is also vitally important that we all reduce exposures to petrochemicals, pollutants, chemicals in foods and water, drugs and skin cosmetics and cleansers as these will ultimately build up if the liver is struggling to get rid of them.

Toxins are readily stored in fat tissue and, being fat soluble, are able to mix and latch onto fat molecules. The liver has a method of getting rid of these through a strong enzyme system known as the p450 cytochrome enzymes. This system has two elements:

The Phase 1 or activation system latches onto and pulls out the toxin from the fat molecule. The major enzyme is super oxide dismutase (SOD) and relies on molybdenum and zinc predominantly as its co-factors i.e. the components that make the enzymes work. Other beneficial nutrients that support Phase 1 activation are Vitamins B2, B3, B6, plus iron and manganese. Antioxidant nutrients are Vitamins A, C, and E, beta-carotene, flavonoids, proanthocyanidins, selenium and milk thistle. There are of course others which are classified as antioxidants such as lipoic acid, glutathione, cysteine and CoQ10.

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The **Phase 2** or conjugation system enables the liver to make the fat soluble toxins water soluble and therefore ready for elimination via sweat, urine or stool. Glutathione peroxidase (GPO) is the vital enzyme here. Glutathione is generally low in autistics due to poor sulphation i.e. the conversion of homocysteine to cysteine and then to glutathione; and therefore autistics have poor abilities to produce sufficient GPO and consequentially have impaired detoxification capacities. Selenium is the vital co-factor in firing GPO. Other beneficial vitamins are B6, B12 and folic acid (B9) and magnesium, most of which are also reduced in autistics.

There is overwhelming evidence that supporting detoxification in the treatment of autistics can lead to dramatic changes in behaviour, mood and abilities due to the increasing ability for that child to detoxify.

Therefore by providing the vital and necessary nutrients required by the liver to function will enable your child to detoxify better and to take the stress off the liver.

So what can we do to help?

I feel that we firstly need to look at the possible symptoms associated with liver stress and poor liver function in relation to autism. These include the following:

- Increased allergic reactions
- Brain fog
- Poor memory and concentration

- Mood swings
- Depression
- Coated tongue
- Bad breath
- Nausea
- Candida
- Constipation
- Alternating diarrhoea and constipation
- Pale coloured stools
- Stools that float
- Bloating
- Flatulence
- Erratic blood sugar control
- Easy weight gain
- Abdominal pain
- Hay fever
- Asthma / allergies
- Eczema
- Dark shadows under the eyes
- Fat deposits beneath the eyes and skin
- Inflamed eyes
- Red or dry eyes
- Pale fingernail beds and face
- Dizziness
- Insomnia
- Nervousness
- Night blindness
- Fast pulse

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Many issues listed here are experienced by our children and the liver plays a significant role in each. Of course there are other underlying causative issues such as dysbiosis, leaky gut, poor hydrochloric acid production to name but a few but these signs point at a need to support the liver.

This is how we can help:

Foods consumed should be organic

Carbohydrate foods: cut out refined carbohydrates and sugar and provide complex carbohydrates such as **porridge oats** (unless on a GF diet), **brown rice**, **whole meal flour** (unless on a GF diet) **fruits and vegetables**.

Vegetables that are beneficial to liver function include **garlic**, **Jerusalem artichokes**, **leeks**, **onions**, **broccoli**, **parsley**, **beetroot**, **radish**, **Brussels sprouts**, **cabbage**, **collards**, **kale**, **dandelion** and **watercress**, **sprouted grains**, **horseradish** and **fennel**



Fruits that are beneficial to liver function include: **apricots**, **avocados**, **bananas**, **blackberries**, **blueberries**, **pomegranates**, **strawberries**, **cranberries**, **lemons**, **papaya**, **pineapple** and **watermelon**. NB: if candidiasis is present grapes, apples and raisins should be avoided.

Protein: amino acids derived from proteins are specifically involved with the liver and its functions. The amino acids **cysteine**, **methionine** and **taurine** are sulphur containing and help with detoxification and increase glutathione levels. **Taurine** is also beneficial in the formation of bile salts.

Other amino acids are also important in aiding detoxification and liver function such as **glutathione** which assists in detoxifying pollutants, heavy metals, drugs and other chemicals. It converts stored toxins into water soluble toxins which can then be expelled. Similarly, **carnitine** pushes fats

into cells as fuel and therefore burns fat and reduces the opportunity for toxins to be stored.

Fats: saturated, trans and hydrogenated fats are of no use to the body and therefore need to be reduced in the diet. These come from butter, animal fats and margarines and heated fats. Essential fatty acids however are important and come predominantly from **fish**, **nuts and seeds** and **algae** and **sea weeds** (these also rich in amino acids, derived from protein). These are important for building body structures such as cell membranes, they can also reduce inflammation and help the gall bladder to release bile salts.

Lecithin is also important and comes from **eggs** and **soy beans**. It helps reduce cholesterol, even though cholesterol is important for bile salt production and hormone production the liver will manufacture 45-55% of what our bodies require: a total of 1100mg per day.

Water aids liver function and detoxification. Water should be **purified** and about 1.5 to 2 litres per day should be consumed. Tap water contains many chemicals such as chlorine which is toxic to the body, so filtered or preferably reverse-osmosis filtered water should be used if possible. Other beneficial drinks include **dandelion tea**, **tinctures**, **lemon** and **green tea** which are also good for detoxification and stomach and liver support.

Herbs beneficial to the liver include **blackroot**, **blueflag**, **burdock**, **nettle** and **bog bean** help prevent constipation. **Dandelion** is probably the better one as it triggers the contraction of the gall bladder and flow of bile and increases liver repair. **Milk thistle** or **silymarin** is also a very important liver herb. It stimulates the liver enzyme function, bile flow and aids in liver repair. It is a good herb to use if skin problems are apparent. **Turmeric** is a potent anti-inflammatory herb and



stimulates gall bladder and bile flow and may aid in stomach acid production.

Nutrients that are good for the liver include **manganese** and **zinc**. Both are needed for super oxide dismutase (SOD) Phase 1 liver enzymes. **Selenium** is important for glutathione peroxidase, the most beneficial Phase 2 conjugating enzyme.

From the above dietary focus, we can influence the key liver activities: for example Phase 1 activation as described above is particularly triggered by Vitamin A alongside Vitamins B2, B3 and B6 which are all stored in the liver. Whereas Phase 2 conjugation is aided by Vitamin B6, folic acid and Vitamin B12 in conjugation with magnesium and selenium etc.

In summarising, the one consistent area that is poorly addressed in people with autism in my experience is the liver function. It is an area that I personally always address in my autistic patients and judging by some of the wonderful responses I have received may well be an area that many other practitioners need to focus. I would also recommend those with a keen interest should read a wonderful book: '**Liver Detox Plan**' by **Xandria Williams** from which I have gained much insight and information.

Of course there are a number of other areas on which we need to focus. Autism is a multi-factorial condition that encompasses issues with detoxification, immunological aberrations and inflammatory issues. With corrective dietary support it is no wonder we can see many improvements in our children. Let nutrition be the medicine of the future!

If you would like further information or would like to talk to me regarding advice or to make an appointment then please contact The Autism File on **020 8979 2525** or on my personal email: **jon@autismfile.com**.