Systemic and adipocyte transcriptional and metabolic dysregulation in Idiopathic Intracranial Hypertension.

Full text at:

https://insight.jci.org/articles/view/145346/pdf

Idiopathic Intracranial hypertension (IIH) most often occurs in young women and is more often found in those in with increased body weight. Recent studies have shown an increased risk for cardiovascular disease and type 2 diabetes in IIH patients above and beyond that caused by weight alone (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6618853/?report=printable). Data has also shown that there is an abnormal hormone profile in IIH, very different to what is seen in people of the same gender (male/female), age and weight. This hormone profile is characterized by high levels of androgens (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6483000/pdf/jciinsight-4-125348.pdf) Androgens are found in men and women but usually higher in men. This research found that androgen levels were increased in women with IIH, but not as high as is found in men. These features suggests that it is likely that there is more going on the body of a patient with IIH than raised brain pressure alone. Indeed, these data suggest that an abnormal metabolism maybe occurring in people with IIH.

To investigate this further we conducted a very detailed analysis over the last decade. The results (https://pubmed.ncbi.nlm.nih.gov/33848268/) were recently published.

This research compared women with IIH women without IIH patients and the groups were matched to be the same weight. This means that the results seen are not driven by weight but by other factors. We found that people with IIH have insulin resistance greater than that caused by weight alone. This suggests that people with IIH have a greater difficulty in regulating their blood sugar (Insulin resistance). Insulin resistance is already known to be a risk factor for developing type 2 diabetes and gestational diabetes (diabetes in pregnant women). The researchers also found increased leptin (a protein produced by fat cells that is a hormone acting mainly in the regulation of appetite and fat storage) in the blood of people with IIH excess to that caused by weight. The study also looked at the distribution of weight in people with IIH and

noted that weight is most often found in the tummy area which is seen in people with other metabolic diseases.

Most importantly, the research explored why people with IIH may be prone to weight gain. We studied the fat tissue of people with IIH and showed that the basic function of the fat tissue was very different from other individuals (even individuals of the same weight, age and gender). We noted that the chemical machinery in the fat tissue (evaluated transcriptomics and metabolomics) identified that the fat tissue is programmed to make more fat tissue. This suggests that people with IIH might be prone to weight gain and that losing weight could be more difficult.

This paper shows that IIH is more than a disease of the eyes and brain, it is a disease that affects the whole body. It is unknown how this altered metabolism in IIH affects brain pressure and the eyes and this requires further research. However, these findings represent new areas of IIH which need treatment. Treating the metabolic changes found in this study could help reduce the risk of people with IIH developing cardiovascular diseases and diabetes.

Key points:

- IIH patients are insulin resistant
- IIH patients are leptin resistant
- Fat tissue in IIH patients is programmed to make more fat
- The data suggests IIH is a metabolic disease as well as a brain disease