Transcriptomic Analysis of Non-Alcoholic Fatty Liver Disease in Cafeteria Diet Induced Obese Rats

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Abstract : Non-alcoholic fatty liver disease (NAFLD) has become one of the most chronic liver diseases, prevalent among people with morbid obesity. NAFLD does not develop clinically significant liver disease, however cirrhosis and liver cancer develop in subset and currently there are no approved therapies for the treatment of NAFLD. The study is aimed to understand the various key genes involved in the mechanism of NAFLD which can be valuable for developing diagnostic and predictive biomarkers based on their histologic stage of liver. The study was conducted on 16 male Sprague Dawley rats. The animals were divided in two groups: control group (n=8) fed on ad libitum normal chow and regular water and the cafeteria group (CAF)) (n=8) fed on high fatty/ carbohydrate diet. The animals received their respective diet from 4 weeks onwards from D.O.B until 25 weeks. Liver was extracted and RT² Profiler PCR Array was used to assess the NAFLD related genes. Histological evaluation was performed using H&E stain in liver tissue sections. Our PCR array results showed that genes involved in anti-inflammatory activity (Ifng, IL10), fatty acid uptake/oxidation (Fabp5), apoptosis (Fas), lipogenesis (Gck and Srebf1), Insulin signalling (Igfbp1) and metabolic pathway (pdk4) were upregulated in the liver of cafeteria fed obese rats. Bloated hepatocytes, displaced nucleus and higher lipid content were seen in the liver of cafeteria fed obese rats. Although Liver biopsies remain the gold standard in evaluating NAFLD, however an approach towards non-invasive markers could be used in understanding the physiology, therapeutic potential, and the targets to combat NAFLD.

Keywords : biomarkers, cafeteria diet, obesity, NAFLD

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