

Endocrinology Meet 2018 : Effects of the loading of excessive sodium chloride on the pathosis mimicking type 2 diabetes mellitus in spontaneously diabetic torii (SDT) fatty rats - Soon Hui Teoh - Tokyo Univ of Agriculture, Japan**Dr. Soon Hui Teoh**

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Abstract

Type 2 diabetes mellitus had become an international health concern with its growing number of patients globally. At the same time, excessive salt consumption was also seen as a major cause of diseases such as hypertension and may expedite renal complications in diabetic patients. In this study, we investigated the effects of excessive sodium chloride supplementation on the kidney of the Spontaneously Diabetic Torii (SDT) fatty rat, an obese type 2 diabetes model. Male and female SDT fatty rats and normal Sprague Dawley (SD) rats at 5 weeks of age were loaded with 0.3% NaCl in drinking water for 13 weeks. Blood serum and urinary parameters were observed throughout the experiment and kidney samples were examined in histopathological and genetical analyses. Significant changes on the body weight, blood pressure, urine volume, creatinine clearance, BUN, relative gene expressions of $\text{TNF-}\alpha$, $\text{IL-1}\beta$, MCP-1 and $\text{TGF-}\beta$ were observed in the salt loaded male SDT fatty rats. Urinary L-FABP (Liver type Fatty Acid Binding Protein) and albumin levels were higher observed in the salt loaded male SDT fatty rats throughout the period, but urinary albumin levels in the female SDT fatty rats remain unchanged. In the kidney, slight Armani Ebstein lesions, tubular regeneration, hyaline cast and inflammatory cell infiltration were observed in female SDT fatty rats while the levels of some findings were higher in the salt loaded group. The kidney of the salt loaded male SDT fatty rats demonstrated higher degree of findings compared to the female group, and the male unloaded group. Increased levels of urinary biomarkers and histopathological changes in salt loaded SDT fatty rats shows that excessive salt consumption may act as a diabetic pathology exacerbation factor, but the pathosis may be influenced by gender difference. Urinary L-

FABP levels may act as a useful biomarker to detect slight tubular damages in the kidney.

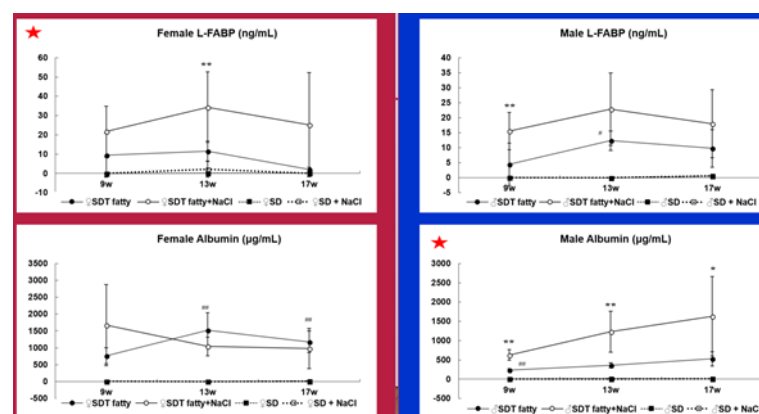


Image Fig. 1 Urinary L-FABP levels increased with salt load in both female and male SDT fatty rats. While urinary albumin levels only increased in male SDT fatty rats.

Market Analysis

Obesity is a condition where a man has assembled so much muscle to fat quotients that it may unfavourably affect their health. This favour to bodyweight is no less than 20% higher than it ought to be, he or she is viewed as corpulent. Body Mass Index (BMI) in the vicinity of 25 - 29.9 is viewed as overweight and the BMI with 30 or over the person is as fat.

During the previous 20 years, obesity among grown-ups has ascended totally in the United States. The most recent information from the National Centre for Health Statistics expresses that 33% of the population 20 years old and more settled—in excess of 100 million individuals—are strong. This advancement isn't kept to grown-ups however rather, has in like way influenced young people. Among youth, 18 percent of youngsters created 6-11 years and 21 percent of teenagers created 12- 19 years are viewed as obese. These rates of

obesity have critical repercussions for Americans' success. In any case, one of the national prosperity objectives for the year 2020 is to reduce the consistency of obesity among grown-ups by 10 %, current information demonstrates that the circumstance isn't progressing.

The Worldwide Anti-Obesity Drugs Advertise is assessed to witness a CAGR of 20.9% during the estimate period 2017-2023. The advertise is analyzed based on three portions, specifically best FDA endorsed drugs, sorts of anti-obesity drugs, and locales. The top FDA approved drugs used in anti-obesity drugs are Xenical, Saxenda, Contrave, Belviq, and Qsymia. Xenical is the largest selling drug in the market until 2012, but saw a dip in its revenue over the years. and also recently approved Saxenda by Novo Nordisk is gaining large interest among obese people and is growing at a fast growth rate.

Key Players: F. Hoffmann La Roche, GlaxoSmith Kline, Orexigen Therapeutics, Vivus Therapeutics, and Eisai Co, Ltd. are the key players in the market. Boehringer Ingelheim, Merck & Co, Nova Nordisk, Pfizer, Rhythm Pharmaceuticals, Zafgan, and Takeda Pharmaceuticals are the other prominent vendors.

The values of chronic obesity market value is increased gradually The top FDA approved drugs used in anti-obesity drugs are Xenical, Saxenda, Contrave, Belviq, and Qsymia. Xenical is the largest selling drug in the market until 2012, but saw a dip in its revenue over the years. and also recently approved Saxenda by Novo Nordisk is gaining large interest among obese people and is growing at a fast growth rate. Over the past three decades, the prevalence of obesity has risen to reach epidemic proportions in the United States and Europe. Despite public health efforts marked shift towards healthier lifestyles is likely over the next ten years; rather, the health problems of obese and overweight people will increase.

The number of obese adults in the seven major markets(United States, France, Germany, Italy, Spain, United Kingdom and Japan) is expected to grow from 95 million in 2000 to 139 million in2010 (see below). Less than 25% of potential patients are formally

diagnosed as obese, and less than 20% of those who are diagnosed are treated with pharmacological therapy

Recent Publications (minimum 5)

- 1.Katsuda Y, Kemmochi Y, Maki M, et al. Physiological changes induced by salt intake in female Spontaneously Diabetic Torii-Leprfa (SDT fatty) rat, a novel obese type 2 diabetic model. *Anim Sci J.* 2014 May;85(5):588-94
- 2.Matsui K, Ohta T, Oda T, Sasase T, et al. Diabetic-associated complications in Spontaneously Diabetic Torii fatty rats. *Exp Anim.* 2008; 57(2): 111-21
- 3.Masuyama, T., Katsuda, Y., and Shinohara, M. 2005 A novel model of obesity-related diabetes: introgression of the Lepr(fa) allele of the Zucker fatty rat into nonobese Spontaneously Diabetic Torii (SDT) rats. *Exp. Anim.* 54: 13–20
- 4.Ishii, Y., Ohta, T., Sasase, T. et al. Pathophysiological Analysis of Female Spontaneously Diabetic Torii Fatty Rats. *Exp Anim.* 2010; 59(1): 73-84
- 5.Katsuda Y, Ohta T, Miyajima K et al. Diabetic complications in obese type 2 diabetic rat models. *Exp Anim.* 2014; 63(2):121-32.