

## Biochemical effect of various anti-diabetic therapies on obesity and insulin resistance induced by monosodium glutamate in male rats

Sherin. M. Khodier

Department of Biochemistry, Faculty of Veterinary Medicine, Suez Canal University, Ismailia, Egypt



### Abstract

**Background:** This research aims to summarize the metabolic changes in male obese rats induced by MSG and study the possible effect of Metformin, DPP4 inhibitor (Janumet), liraglutide (Victoza) on improvement this metabolic changes through the determination of the following parameters (Triacylglycerol, Cholesterol, fasting blood glucose, Glucagon, Insulin, HbA1c, Leptin, Resistin and inflammatory Cytokines (TNF- and Interleukin-6), beside calculated HOMA- IR which contribute in obesity and their complication. **Methods:** 60 male rats divided into control group A (n=12) received distilled water, and MSG group B (n=48) administered orally with MSG at a dosage (15 mg per kg body weight) for three months. After confirmation of obesity, MSG administrated rats were began the treatment strategy and divided into 2 sections 1st section (n=24) continued administration with MSG and 2nd section (n=24) continued without administration of MSG, and each section contains four groups each group (n=6), non-treated MSG obese rat. Victoza, Janumet, and Metformin, after a month from beginning the treatment, body weight and the previous parameters were measured. Results were articulated as mean  $\pm$  SE and every one statistical comparison was created by a one-way ANOVA experiment followed by Duncan's post hoc multi-range test using SPSS, version 20.0.

**Results:** MSG obese rats were shown a marked rise in body weight average, Triacylglycerol, Cholesterol, Fasting sugar - HBA1c - Insulin, HOMA-IR, leptin, resistin, and pro-inflammatory Cytokines). While the lifestyle modification model and all treated groups showed a reduction in average B.W and a significant improvement in Triacylglycerol, Cholesterol, FBS, HbA1c, insulin, HOMA-IR, leptin, resistin, TNF- $\alpha$ , and IL-6. **Conclusion:** This study indicates that lifestyle modification and anti-diabetic drugs used (Victoza, Janumet, and metformin) were improved carbohydrate and lipid metabolism, insulin sensitivity and pro-inflammatory cytokines levels, Thus it can be used for prevention occurrence of T2DM in cases suffer from obesity and insulin resistance.

**Keywords:** Obesity, MSG, lifestyle modification, IR, pro-inflammatory cytokines.

**Biography:** Sherin M. Khodier holds PhD degree in Biochemistry from Suez Canal University, faculty of veterinary medicine, Egypt.

Graduated from Faculty of Veterinary Medicine, Suez Canal University in 2002, then finished her Microbiology diploma in 2005, and Biochemistry diploma in 2007, then she obtained a Master degree of Biochemistry in 2012 in title with "Evaluation of some biochemical parameters in rats in relation to renal failure", and in 2019 she finished her PhD in biochemistry in title with "Evaluation of some biochemical parameters in rats in relation to obesity induced by Monosodium glutamate"

Sherin has some published researches as "Evaluation of some biochemical parameters in relation to acute renal failure" in SCVMJ and "The toxic effect of Mono Sodium Glutamate as food additives on some biochemical parameters in male rat" in Animal Health Research Institute Journal.

Sherin started her biochemistry career in diagnostic laboratory in 2007 till reached head of biochemistry & hormone unit in a private laboratory, and worked as a head of information center at Veterinary Medicine Directorate, Egypt.

Sherin interested in new and innovative biochemistry researches focused on clinical biochemistry, biomarkers and food chemistry.

Certified in ISO 22000:2005 awareness & Auditor /lead Auditor training course, HACCP "Hazard Analysis & Critical Control Points, Basic biosafety and biosecurity Measures, Ethics deal with experimental animals and their uses in research, PCR Professional, Biotechnology & Nanotechnology Course, Management Skills Development Program for Gov. Employees, Comprehensive Quality Management, Crises Management, Workload pressure & control methods, Building & Management of teamwork, and Mini MBA

[16<sup>th</sup> International Conference on Pharmaceutical Chemistry](#); Webinar- August 17-18, 2020.