**ABSTRACT**

Accumulation of fatty acids into non-adipose tissues can lead to cell dysfunction and cell death. Analytical methods for quantifying the composition of fatty acyl chain are specific to, or made more sensitive by saturated fatty acids. Using H4IIE rat hepatoma cells, a model system of fatty liver disease, changes to the cellular phospholipid pool following exposure to saturated or unsaturated fatty acids were analyzed.

**INTRODUCTION**

Metabolic syndrome is a collection of diseases including hypertension, diabetes mellitus, hyperlipidemia, obesity, and dyslipidemia. These diseases are associated with a number of pathological processes, including inflammation, cell dysfunction and cell death. Lipotoxicity from accumulation of long chain fatty acids in non-adipose tissues can lead to cell dysfunction and cell death. Lipoatrophy, as diagnosed by imaging techniques such as MRI and spectroscopic techniques such as Nuclear Magnetic Resonance (NMR), is an emerging disease that is being studied for its relationship to metabolic syndrome.

**METHODS**

Cell-Culture and Sample Preparation

H4IIE cells were cultured in Dulbecco’s Modified Eagle’s Medium (DMEM) and 10% fetal bovine serum (FBS). Cells were incubated with either 500 μM palmitic or oleic acid, and harvested after 24 hours. Cell culture media was supplemented with either 500 μM palmitic or oleic acid, and harvested after 24 hours. Cell culture media was supplemented with 0.1% acetic acid.

Liquid Chromatography/Mass Spectrometry

Electrospray ionization (ESI) was used to interface with both a triple quadrupole and a quadrupole ion trap mass spectrometer. Mobile phases used were 50 mM aqueous ammonium acetate (pH 5.0) and 50% acetonitrile. A Shimadzu LC2000 Liquid Chromatograph was used to deliver a Flow Rate 550 μL/min. Data was acquired using ESI-MS. Gross and other researchers have used infusion and tandem mass spectrometry to analyze phospholipid composition.

**RESULTS**

**CONCLUSIONS**

The data presented in this study shows that the cellular phospholipid pool is significantly affected by saturated fatty acids in H4IIE rat hepatoma cells. The results indicate that saturated fatty acids lead to a change in the phospholipid composition of the cell, which may contribute to the development of fatty liver disease.

**REFERENCES**


