P0548-Identifying Putative Novel Bioactive Molecules in Fish Oil Supplements

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INTRODUCTION

Fish Oil (FO) Supplementation

- Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are the two major omega-3 components in FO supplements.
- FO supplements are prescribed to metabolic syndrome patients to decrease triglyceride levels and can ameliorate Non-Alcoholic Fatty Liver Disease.
- FO supplements increase the risk of Type 2 Diabetes (T2D)

Is FO Beneficial or Harmful?

PRELIMINARY DATA

3-carboxy-4-methyl-5-propyl-2-furanpropanoic acid (CMPF)

CMPF is a Metabolite of FO Consumption and is Increased in GDM

CMPF Decreases Insulin Biosynthesis and Impairs Glucose Stimulated Insulin Secretion (GSIS)

Elevated CMPF impairs GSIS, an effect not seen at lower concentrations. What is the effect of EPA, DHA at concentrations seen in GDM?

AIMS

AIM 1

To test the functional significance of EPA, DHA in islets in vitro

AIM 2

To determine the effects of EPA, DHA on glucose homeostasis in vivo

METHODOLOGY

In Vitro Experiment

RESULTS

Low Dose EPA, DHA Have No Effect on β -Cell Function

High Dose EPA, DHA Impair β -Cell Function

CONCLUSION

We observed increased concentrations of EPA and DHA in serum of GDM patients. Could that be responsible for the decline in β -cell function which leads to the transition from GDM to T2D?

FUTURE PLANS

In Vitro

- Measure caspase 3 activity as an indicator of apoptosis
- Determine the effects of EPA, DHA on insulin biosynthesis and glucose metabolism

In Vivo

- Test the effects of EPA and DHA on glucose homeostasis in vivo
- Identify metabolites in serum of FO treated mice using Mass Spectrometry

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