

Propionic Acid Influence on Human Adipocytes

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Abstract :

Introduction:

Recently, it has been shown that specific members of the microbiota (specifically Firmicutes) in humans are associated with obesity and associated pathology. Although it is still unclear how microbiota can interact and influence the host adipose tissue related pathophysiology especially low-grade inflammation, dietary fibers appear to be protective, suggesting a cross-talk between the colonic metabolism and adipose tissue-induced inflammation. Short-chain fatty acids, e.g. propionic acid (PA), are the principal products of the dietary fiber fermentation by microbiota. In our earlier studies, it has been shown that PA inhibits inflammatory marker released by human adipose tissue. However, we have not yet determined which cell type responds to PA treatment, adipocytes or macrophages. Therefore, the goal of this study is to investigate the influence of PA on adipocytes inflammation.

Materials and methods:

To achieve our aim subcutaneous AT samples were obtained from 13 patients (mean age of 42.76 ± 15) who underwent abdominal surgery at An-najah National University Hospital and Rafidea Hospital. Adipose tissue was disintegrated into adipocytes via a protocol we optimized. Then the effect of PA on isolated cells were investigated via ELISA and PCR.

Results and discussion:

In this study we report a detailed description of steps to optimize the isolation of adipocytes through troubleshooting suggestions, highlighting the critical features and steps of the protocol. For example, we optimized the incubation time of collagenase and centrifugation speed and time. then we optimized adipocyte culturing. After this, we determined the effect of PA on leptin secretion via adipocytes and our preliminary results suggest that PA had no effect.

Conclusion:

We optimized a cost and time effective protocol to isolate adipocytes cells at our laboratory. Our preliminary results suggest that PA had no effect on adipocytes and consequently either other cells such as macrophages or cross talk between cells of adipose tissue is responsible for PA effect. this study provides a source of adipocytes enable future studies to unravel new insights in obesity and diabetes pathogenesis and molecular mechanisms, which may help in preventing and/or treating them.