

Developing an Advanced Sciences Module on Inflammation, Obesity and Metabolic Syndrome for the University of Colorado School of Medicine Trek Curriculum

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BACKGROUND

The ability to intertwine basic science knowledge with clinical disease is essential to the practice of medicine. Providers who understand both the foundational and clinical science that underlie disease processes and therapeutic interventions are best positioned to provide optimal care as it evolves throughout their careers. In this module, the concepts of biochemistry and immunology are introduced alongside the clinical experience in order to enhance learning and decrease the stigma associated with obesity.

OBJECTIVES

To design an introduction to the non-behavioral etiology of obesity and metabolic disease to reduce provider bias, improve the quality of care for patients with obesity, and highlight future research needs concerning our understanding and treatment of metabolic disease. To add clinical relevance to the module a fictionalized case study of a patient with insulin resistance and other features of metabolic syndrome was introduced at the beginning and followed throughout the module as related to clinical presentation, diagnosis, treatment options, and outcomes.

METHODS

A literature review was conducted to include high-quality systematic reviews, randomized controlled trials, and case-cohort studies. Controversial or unsettled claims were excluded from the aggregated teaching materials. A pilot of the module was delivered on November 18, 2021, after coordination with the Departments of Immunology and Endocrinology at the University of Colorado School of Medicine. A pre/post survey was administered to participants to assess levels of confidence related to module learning objectives.

RESULTS

The module provides an overview of inflammation, obesity, and metabolic syndrome through examining the underlying basic science of inflammatory mechanisms, cellular components, and molecular signaling. The discussion further integrates advanced topics including inflammation and the gut, dietary effects on gut microbiota, inflammatory markers of obesity and metabolic syndrome, inflammation in insulin-sensitive tissues, and anti-inflammatory therapeutics in the treatment of insulin resistance.

Results of the pre-post survey indicate that participants confidence increased describing the pathophysiology of inflammation in the context of metabolic syndrome. Furthermore, respondents more confidently identified clinical and pharmacological research opportunities surrounding inflammation and metabolic syndrome.

DISCUSSION

To improve the care of patients with obesity and alter the underlying provider bias that inhibits proper care of these individuals, it is important to incorporate education for future providers that explores the non-behavioral drivers of obesity and metabolic disease. Given the growing body of evidence alluding to the multifactorial etiology of metabolic disease, the role of inflammation in the context of obesity and metabolic syndrome is an area of physiology that requires attention by those involved in teaching future physicians. Using an evidence-based approach to adult education, we can increase the confidence of future providers to treat patient with metabolic syndrome.