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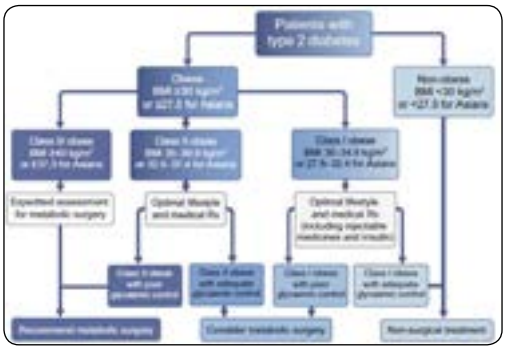
Royce P Vincent

King's College Hospital NHS Foundation Trust, UK

The role of bile acids in remission of type 2 diabetes after metabolic surgery

Type 2 diabetes is a pandemic afflicting more than 400 million people, with estimates of 650 million cases by 2040. Even with significant advances in pharmaceutical agents recently shown to reduce cardiovascular events, many patients with diabetes fail to achieve glycaemic treatment goals required to reduce micro and macrovascular complications. Metabolic surgery (bariatric surgery) is currently the most effective treatment to achieve significant and sustained weight loss in morbid obesity. There is now growing evidence of long-term remission of type 2 diabetes after metabolic surgery hence, the second Diabetes Surgery Summit (DSS-II), an international consensus conference, developed global guidelines that recommend inclusion of metabolic surgery among interventions for selected patients with type 2 diabetes and obesity. These recommendations have now been endorsed by more than 50 organisations worldwide, including major national and international diabetes and surgical societies. However, the pathophysiology of improved glucose metabolism after metabolic surgery remains poorly understood. Bile acid pool and composition are altered following certain metabolic surgeries. Thus, bile acids have emerged as a potential contributor to the improved glycaemic control after the procedures. Bile acids are the main component of human bile and have traditionally been considered mediators of lipid absorption and cholesterol metabolism, facilitated by their amphipathic nature. In recent years the discovery that specific bile acids differentially activate the G protein-coupled membrane receptor (TGR5) and the nuclear receptor, farnesoid X receptor (FXR), has identified bile acids as complex metabolic molecules that play a role in numerous pathways. This session will provide an overview of our current understanding of the interplay between bile acids and incretin (gut) hormones, the laboratory analysis of bile acids and its potential role in improving glycaemic control and remission of type 2 diabetes.



DSS-II: Surgery in the type 2 diabetes treatment algorithm. Cummings & Rubino, Diabetologia, 2018

Recent Publications

1. Risstad H, Kristinsson JA, Fagerland MW, le Roux CW, *et al.* Bile acid profiles over 5 years after gastric bypass and duodenal switch: results from a randomized clinical trial. Surgery for Obesity and Related Diseases 2017; 13:1544-1553.
2. Mayerhofer CCK, Ueland T, Broch K, Vincent RP, *et al.* Increased Secondary/Primary Bile Acid-Ratio in Chronic Heart Failure. Journal of Cardiac Failure 2017; 23:666-671.

3. de Jonge C, Rensen SS, Verdam FJ, Vincent RP, *et al.* Impact of duodenal-jejunal exclusion on satiety hormones. Obesity Surgery. 2016; 26:672-8.
4. Belgaumkar AP, Vincent RP, Carswell KA, Hughes RD, *et al.* Changes in Bile Acid Profile After Laparoscopic Sleeve Gastrectomy are Associated with Improvements in Metabolic Profile and Fatty Liver Disease. Obesity Surgery. 2016; 26:1195-202.
5. Dutia R, Embrey M, O'Brien CS, Haeusler RA, *et al.* Temporal changes in bile acid levels and 12α-hydroxylation after Roux-en-Y gastric bypass surgery in type 2 diabetes. Int J Obes (Lond). 2015; 39:806-13.

Biography

Royce P Vincent (*MBBS, MSc, EuSpLM, FRCPath, MD*) is a Consultant Chemical Pathologist at King's College Hospital NHS Foundation Trust and an Honorary Senior Lecturer at King's College London, UK. He is the Clinical Lead for Biochemistry and Parenteral Nutrition services. He obtained his MD (Res) at Imperial College London. His research interests are in clinical nutrition, obesity and endocrinology. He has published multiple original research and review articles and is serving as an international editorial board member for Translational Metabolic Syndrome Research.

royce.vincent@nhs.net

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