

Changing Paradigms in Diabetes: Scientific Breakthroughs of the Past 15 Years

Khan MH¹

¹M.A. Halim Khan, Associate Professor & Head, Dept. of Endocrinology, Shaheed Suhrawardy Medical College & Hospital, Dhaka, Bangladesh

Abstract

Over the past 15 years, the landscape of diabetes care has been transformed by remarkable scientific and clinical advances. Breakthroughs in genetics, epigenetics, and gut microbiome research have provided deeper insights into disease pathophysiology, while progress in beta-cell biology has opened novel therapeutic avenues. Pharmacological innovation has been central to this transformation: GLP-1 receptor agonists have redefined standards of care by demonstrating not only effective glycemic control but also significant cardiovascular and renal protection. A major milestone has been the development of SGLT2 inhibitors, particularly empagliflozin, which has shown robust benefits in reducing heart failure, slowing chronic kidney disease progression, and lowering cardiovascular mortality, thereby shifting treatment goals beyond glucose lowering toward organ protection. More recently, dual and triple agonists such as tirzepatide have delivered unprecedented outcomes in glucose lowering and weight reduction.

Perhaps the most significant paradigm shift has been the transition from a glucose-centric model to a comprehensive cardio-renal-metabolic approach, with empagliflozin and related agents at the forefront of this revolution. In parallel, the integration of artificial intelligence, big data, and evolving global health policies has advanced patient-centered care and improved access to life-saving therapies. Looking ahead, the advent of oral insulin, immunotherapies, and fully automated artificial pancreas systems promises to reshape diabetes management, offering improved outcomes and quality of life for patients worldwide. [*J Assoc Clin Endocrinol Diabetol Bangladesh*, 2025;4(Suppl 1): S32]

Keywords: Diabetes management, GLP-1 receptor agonists, SGLT2 inhibitors, Cardio-renal-metabolic approach

Presenting and corresponding author: Dr. M.A. Halim Khan, Associate Professor & Head, Dept. of Endocrinology, Shaheed Suhrawardy Medical College & Hospital, Dhaka, Bangladesh.
Email: dr.mahalimkhan@gmail.com