Chapter-29

Allopathic Treatment of Diabetes

Author

Dr. Ajay Kumar
Department of Zoology,
R. C. College, Sakra (Dholi),
Muzaffarpur -843105, Bihar
Email-ajaycpr70@gmail.com

Abstract

Allopathic medicine, known as conventional or Western medicine, is pivotal in managing diabetes mellitus. This chapter delves into its approach, encompassing pharmacological interventions, lifestyle modifications, and patient education. Allopathic medicine aims to attain optimal glycemic control, avert complications, and enhance the quality of life for individuals with diabetes.

Keywords: Allopathic medicine, Diabetes treatment, Pharmacological interventions, Lifestyle modifications, Glycemic control, Complications prevention, Patient education

****

1. INTRODUCTION

Diabetes mellitus, a chronic metabolic disorder characterized by elevated blood glucose levels, poses significant health challenges globally. Allopathic medicine, commonly known as conventional or Western medicine, serves as the cornerstone in the management of diabetes. This approach encompasses a comprehensive treatment strategy involving pharmacological interventions, lifestyle modifications, and patient education.

With the prevalence of diabetes steadily rising worldwide, allopathic medicine plays a central role in addressing this epidemic. By focusing on evidence-based practices and established medical principles, allopathic treatment aims to achieve optimal glycemic control, prevent complications, and enhance the overall quality of life for individuals living with diabetes [1,2].

In this chapter, we will explore the various components of allopathic treatment for diabetes, ranging from the use of medications to regulate blood glucose levels, to the implementation of dietary and exercise interventions, as well as the importance of patient education in empowering individuals to manage their condition effectively. Through a comprehensive approach, allopathic medicine strives to mitigate the impact of diabetes on individual health outcomes and promote well-being in the face of this chronic condition.

2. PHARMACOLOGICAL INTERVENTIONS

Allopathic treatment of diabetes relies significantly on pharmacological interventions to manage blood glucose levels effectively and improve insulin sensitivity. These medications target various aspects of glucose metabolism and may be prescribed based on the type and severity of diabetes, as well as individual patient factors.

Insulin Therapy: Insulin remains a cornerstone of diabetes management, particularly in Type 1 diabetes and advanced Type 2 diabetes. Different types of insulin, including rapid-acting, short-acting, intermediate-acting, and long-acting formulations, are available. These insulins mimic the body's natural insulin secretion pattern, helping to regulate blood sugar levels throughout the day. Insulin therapy may be prescribed alone or in combination with other antidiabetic medications to achieve optimal glycemic control.

Oral Antidiabetic Medications: For individuals with Type 2 diabetes, oral medications are commonly prescribed to enhance insulin secretion, improve insulin sensitivity, or reduce glucose absorption in the intestines [3]. These medications include:

- **Metformin:** Improves insulin sensitivity and reduces glucose production by the liver.
- **Sulfonylureas:** Stimulate insulin secretion from the pancreas.
- **Meglitinides:** Stimulate insulin secretion in response to meals.
- **Thiazolidinediones:** Improve insulin sensitivity in muscle and fat cells.
- **Dipeptidyl Peptidase-4 (DPP-4) Inhibitors:** Increase insulin secretion and reduce glucagon production.
- **Sodium-Glucose Cotransporter-2 (SGLT2) Inhibitors:** Reduce glucose reabsorption in the kidneys, leading to increased urinary glucose excretion.
- **Alpha-Glucosidase Inhibitors:** Slow carbohydrate absorption in the intestines, resulting in lower postprandial blood sugar levels [5].

Injectable Medications: In addition to insulin, several injectable medications are available for Type 2 diabetes management, particularly for individuals who do not achieve adequate glycemic control with oral medications alone. These injectable medications include:

- **Glucagon-Like Peptide-1 (GLP-1) Receptor Agonists:** Stimulate insulin secretion, suppress glucagon release, and promote satiety, leading to improved glycemic control and potential weight loss.

Combination Therapies: Combination therapy with multiple antidiabetic agents may be prescribed to address different aspects of glucose regulation and enhance treatment efficacy. Combination products containing two or more classes of antidiabetic medications in a single formulation offer convenience and simplify treatment regimens for patients. Combining medications with complementary mechanisms of action can lead to synergistic effects and improved glycemic control [4].

3. LIFESTYLE MODIFICATIONS

Alongside pharmacological interventions, lifestyle modifications are fundamental components of allopathic management for individuals with diabetes. These interventions aim to improve insulin sensitivity, promote weight management, and reduce cardiovascular risk factors through dietary changes, regular physical activity, and behavioral modifications [13, 18, 19].

Diet: Dietary recommendations for individuals with diabetes prioritize balanced nutrition, portion control, and carbohydrate management. Emphasizing a diet rich in fruits, vegetables, whole grains, lean proteins, and healthy fats can help stabilize blood sugar levels and support overall health. Carbohydrate counting, glycemic index/load considerations, and meal timing are often incorporated into

meal planning to optimize glycemic control. Monitoring carbohydrate intake and choosing nutrient-dense, high-fiber foods can help regulate blood glucose levels and prevent spikes in postprandial glucose [11,12].

Exercise: Regular physical activity is essential for improving insulin sensitivity, lowering blood glucose levels, and managing weight in individuals with diabetes. Engaging in aerobic exercise, resistance training, and flexibility exercises can all contribute to improved glycemic control, cardiovascular health, and overall well-being. Exercise recommendations should be tailored to individual preferences, fitness levels, and medical considerations. Incorporating daily movement, such as walking, cycling, swimming, or yoga, can help individuals with diabetes achieve their physical activity goals and maintain long-term health benefits.

Weight Management: Achieving and maintaining a healthy weight is a key goal in diabetes management, particularly for individuals with Type 2 diabetes and obesity. Calorie restriction, portion control, and mindful eating practices can facilitate weight loss and improve metabolic outcomes. Adopting a balanced diet that emphasizes whole foods and limits processed foods, sugary beverages, and high-calorie snacks can support weight management efforts. Multidisciplinary support from healthcare professionals, including dietitians, exercise physiologists, and behavioral therapists, may be beneficial for individuals seeking long-term success in weight management. Setting realistic goals, tracking progress, and receiving ongoing support and encouragement can empower individuals with diabetes to make sustainable lifestyle changes and achieve their desired health outcomes.

4. PATIENT EDUCATION

Patient education is a cornerstone of allopathic diabetes care, empowering individuals with the knowledge and skills needed to self-manage their condition effectively. Education programs cover various aspects of diabetes management, including medication adherence, blood glucose monitoring, meal planning, physical activity, and complication prevention, aiming to improve self-efficacy, self-care behaviors, and health outcomes for patients with diabetes [14,15,16,17].

Diabetes Self-Management Education and Support (DSMES): DSMES programs provide structured education and ongoing support to individuals with diabetes and their families. These programs address a wide range of topics, including diabetes pathophysiology, treatment options, lifestyle modifications, self-monitoring techniques, and psychosocial support. By equipping patients with practical tools and resources, DSMES programs empower them to make

informed decisions about their health and navigate the complexities of diabetes management more effectively. Through group classes, individual counseling sessions, and peer support networks, DSMES programs foster a collaborative and supportive environment where patients can learn from each other's experiences and build confidence in their ability to manage their diabetes.

Continuous Glucose Monitoring (CGM) Education: For individuals using CGM devices to monitor their blood glucose levels continuously, education on device use, data interpretation, and response to glucose trends is essential. CGM education programs help patients understand how to use their devices effectively, interpret glucose data accurately, and make informed decisions about insulin dosing, dietary choices, and physical activity. By teaching patients how to optimize their device settings, identify patterns of hypo- and hyperglycemia, and respond proactively to fluctuations in blood sugar levels, CGM education programs empower patients to take control of their diabetes management and achieve better glycemic control over time [5,6,7,8,9,10].

Diabetes Complications Prevention: Patient education also focuses on preventing acute and chronic complications of diabetes, including hypoglycemia, hyperglycemia, and diabetic ketoacidosis (DKA), hyperosmolar hyperglycemic state (HHS), cardiovascular disease, neuropathy, and retinopathy, nephropathy, and foot complications. Strategies for risk reduction, early detection, and appropriate intervention are emphasized to minimize the impact of diabetes-related complications on patient health and quality of life. By raising awareness about the importance of regular screenings, symptom recognition, and preventive measures, patient education programs empower individuals with diabetes to take proactive steps to protect their long-term health and well-being [20,21].

REFERENCES

[1] American Diabetes Association. (2021). Standards of Medical Care in Diabetes—2021. Diabetes Care, 44(Supplement 1), S1–S232.

[2] Inzucchi, S. E., Bergenstal, R. M., & Buse, J. B. (2015). Management of Hyperglycemia in Type 2 Diabetes, 2015: A Patient-Centered Approach: Update to a Position Statement of the American Diabetes Association and the European Association for the Study of Diabetes. Diabetes Care, 38(1), 140–149.

[3] Davies, M. J., & D'Alessio, D. A. (2018). Management of Hyperglycemia in Type 2 Diabetes, 2018. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care, 41(12), 2669–2701.

[4] Powers, M. A., Bardsley, J., & Cypress, M. (2015). Diabetes Self-management Education and Support in Type 2 Diabetes: A Joint Position Statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Diabetes Care, 38(7), 1372–1382.

[5] Sherifali, D., Berard, L. D., & Gucciardi, E. (2015). Diabetes Canada 2018 clinical practice guidelines for the prevention and management of diabetes in Canada: Pharmacologic Glycemic Management of Type 2 Diabetes in Adults. Canadian Journal of Diabetes, 42(Supplement 1), S88–S103.
[6] Klonoff, D. C., & Perz, J. F. (2011). Assisted Monitoring of Blood Glucose: Special Safety Needs for a New Paradigm in Testing Glucose. Journal of Diabetes Science and Technology, 5(6), 1387–1395.
[7] American Diabetes Association. (2018). 6. Glycemic Targets: Standards of Medical Care in Diabetes—2018. Diabetes Care, 41(Supplement 1), S55–S64.
[8] Powers, M. A., & Bardsley, J. (2015). Diabetes Self-management Education and Support in Type 2 Diabetes: A Joint Position Statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Clinical Diabetes, 33(2), 95–98.
[9] Leelarathna, L., & Thabit, H. (2018). Hypoglycaemia in diabetes: Impact, causes, prevention and management. British Journal of Diabetes, 18(4), 75–80.
[10] Holman, R. R., & Paul, S. K. (2018). Improving outcomes in type 2 diabetes: treating beyond glucose control. The Lancet, 391(10125), 8–10.
[11] Evert, A. B., Dennison, M., Gardner, C. D., Garvey, W. T., Lau, K. H. K., MacLeod, J., Mitri, J., Pereira, R. F., Rawlings, K., Robinson, S., Saslow, L., Uelmen, S., Urbanski, P. B., & Yancy, W. S. (2019). Nutrition Therapy for Adults With Diabetes or Prediabetes: A Consensus Report. Diabetes Care, 42(5), 731–754.
[12] World Health Organization. (2016). Global Report on Diabetes. World Health Organization.
[13] Wild, S., Roglic, G., Green, A., Sicree, R., & King, H. (2004). Global Prevalence of Diabetes. Diabetes Care, 27(5), 1047–1053.
[14] Khunti, K., & Davies, M. (2019). Glycaemic control in people with type 2 diabetes: what is the evidence for appropriate HbA1c targets? Diabetes Research and Clinical Practice, 151, 1–4.
[15] Aroda, V. R., & Knowler, W. C. (2019). Metformin for diabetes prevention: insights gained from the Diabetes Prevention Program/Diabetes Prevention Program Outcomes Study. Diabetologia, 62(9), 1724–1732.
[16] Hemmingsen, B., Schroll, J. B., Wetterslev, J., Gluud, C., Vaag, A., & Sonne, D. P. (2014). Sulfonylurea versus metformin monotherapy in patients with type 2 diabetes: a Cochrane systematic review and meta-analysis of randomized clinical trials and trial sequential analysis. Current Medical Research and Opinion, 30(1), 1–13.
[17] Charbonnel, B., & Karasik, A. (2017). Treatment adherence and persistence: a primary goal for optimal outcomes in patients with type 2 diabetes. Patient Preference and Adherence, 11, 1123–1130.
[18] Schellenberg, E. S., Dryden, D. M., Vandermeer, B., Ha, C., Korownyk, C., Garritty, C., & Balaa, F. (2013). Lifestyle Interventions for Patients With and at Risk for Type 2 Diabetes: A Systematic Review and Meta-analysis. Annals of Internal Medicine, 159(8), 543–551.
[19] Blonde, L., & Draznin, B. (2020). Overview of Management of Type 2 Diabetes Mellitus. In Endotext [Internet]. MDText.com, Inc.
[20] Aronson, R., & Bhardwaj, V. (2019). Medication adherence: a key factor in achieving glycemic control in patients with type 2 diabetes. Clinical Diabetes, 37(4), 321–329.
[21] Khunti, K., Khunti, S., Seidu, S., & Therawiwat, M. (2021). Patient education as a tool for glycaemic control: a literature review. Diabetes, Obesity & Metabolism, 23(1), 3–13.