A comprehensive guide to oral hypoglycaemic agents: Managing diabetes effectively.

Benjamin Kingsley Harley*

Department of Pharmacognosy and Herbal Medicine, School of Pharmacy, University of Health and Allied Sciences, Ho, Ghana

Introduction

Diabetes mellitus, a chronic metabolic disorder characterized by elevated blood sugar levels, affects millions of people worldwide. Effective management of diabetes is essential in order to prevent complications and maintain a good quality of life. While lifestyle modifications play a crucial role, Oral Hypoglycemic Agents (OHAs) have revolutionized diabetes treatment by providing effective and convenient options for controlling blood glucose levels. In this article, we will explore the different classes of OHAs, their mechanisms of action, and their role in diabetes management [1].

Sulfonylureas (SU)

Sulfonylureas are among the oldest and most commonly prescribed OHAs. They stimulate the release of insulin from pancreatic beta cells, thereby lowering blood sugar levels. Examples include glibenclamide, glimepiride, and gliclazide. Sulfonylureas are effective in lowering fasting blood glucose levels but may cause hypoglycemia and weight gain as side effects [2]. They are usually taken before meals.

Biguanides

Metformin, the most widely used biguanide, works by reducing glucose production in the liver and improving insulin sensitivity in peripheral tissues. It does not increase insulin secretion and thus carries a low risk of hypoglycemia. Metformin may also help with weight loss and is often the first-line treatment for type 2 diabetes. However, it can cause gastrointestinal side effects, such as nausea and diarrhea [3].

Thiazolidinediones (TZDs)

Thiazolidinediones, also known as glitazones, improve insulin sensitivity in muscle and adipose tissues. They activate Peroxisome Proliferator-Activated Receptors (PPARs), leading to enhanced glucose uptake and utilization. Rosiglitazone and pioglitazone are commonly prescribed TZDs. However, TZDs are associated with an increased risk of heart failure and other cardiovascular adverse events. Regular monitoring of liver function and cardiovascular health is necessary when using TZDs.

Alpha-glucosidase inhibitors

Alpha-glucosidase inhibitors, such as acarbose and miglitol, slow down the digestion and absorption of carbohydrates in the small intestine. By inhibiting the enzyme alpha-glucosidase, they delay the breakdown of complex carbohydrates into glucose. These medications are particularly effective in controlling postprandial glucose levels. Flatulence and diarrhea are common side effects, which can be managed with gradual dose titration [4].

Dipeptidyl peptidase-4 (DPP-4) inhibitors

DPP-4 inhibitors, also known as gliptins, enhance the activity of incretin hormones, such as Glucagon-Like Peptide-1 (GLP-1). They increase insulin secretion, reduce glucagon release, and slow gastric emptying, leading to improved glycemic control. Sitagliptin, saxagliptin, and linagliptin are examples of DPP-4 inhibitors. These drugs are generally well-tolerated and carry a low risk of hypoglycemia. They are often used as add-on therapy to other OHAs.

Sodium-glucose cotransporter-2 (SGLT2) inhibitors

SGLT2 inhibitors, including empagliflozin, dapagliflozin, and canagliflozin, act by inhibiting glucose reabsorption in the kidneys, resulting in increased urinary glucose excretion. They also promote weight loss and reduce blood pressure. However, SGLT2 inhibitors are associated with an increased risk of genital mycotic infections and urinary tract infections. Dehydration and ketoacidosis are rare but serious side effects [5].

Conclusion

Managing diabetes effectively requires a comprehensive approach that includes lifestyle modifications and appropriate medication. Oral Hypoglycaemic Agents (OHAs) have become integral to diabetes management, offering a range of options for controlling blood glucose levels. Understanding the different classes of OHAs and their mechanisms of action is crucial for healthcare professionals and individuals with diabetes. Sulfonylureas stimulate insulin release, while biguanides reduce glucose production and improve insulin sensitivity. Thiazolidinedione enhance insulin sensitivity in peripheral tissues, and alpha-glucosidase inhibitors slow carbohydrate digestion. DPP-4 inhibitors enhance incretin hormone activity, and SGLT2 inhibitors inhibit renal glucose reabsorption.

***Correspondence to:** Benjamin Kingsley Harley**,** Department of Pediatrics, University of Oulu and Oulu University Hospital, Oulu, Finland, E-mail: bkhar01ley@uhas.edu.gh

***Received**: 18-Apr-2023, Manuscript No. AADY-23-105710; **Editor assigned**: 20-Apr-2023, PreQC No. AADY-23-105710(PQ); **Reviewed**: 04-May-2023, QC No. AADY-23-105710; **Revised:** 08-May-2023, Manuscript No: AADY-23-105710(R);**Published:** 15-May-2023, DOI:10.35841/aady-7.3.145*

***Citation:** Harley B K. A comprehensive guide to oral hypoglycaemic agents: Managing diabetes effectively. 2023; 7(3):145*

References

1. Del Prato S, Felton AM, Munro N, et al. Improving glucose management: Ten steps to get more patients with type 2 diabetes to glycaemic goal: Recommendations from the Global Partnership for Effective Diabetes Management. Int J Clin Pract Suppl. 2005;59(11):1345-55.
2. Krentz AJ, Bailey CJ. Oral antidiabetic agents: current role in type 2 diabetes mellitus. Drugs. 2005;65:385-411.
3. Kardas P. The DIACOM study (effect of DosIng frequency of oral Antidiabetic agents on the COMpliance and biochemical control of type 2 diabetes). Diabetes Obes Metab. 2005;7(6):722-8.
4. Berkowitz SA, Krumme AA, Avorn J, et al. Initial choice of oral glucose-lowering medication for diabetes mellitus: a patient-centered comparative effectiveness study. JAMA Intern Med. 2014;174(12):1955-62.
5. Morris AD, Boyle DI, MacAlpine R, et al. The diabetes audit and research in Tayside Scotland (DARTS) study: electronic record linkage to create a diabetes register. BMJ. 1997;315(7107):524-8.

Citation: *Harley B K. A comprehensive guide to oral hypoglycaemic agents: Managing diabetes effectively. 2023; 7(3):145*