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Original Article

Optimising Antidiabetic Drug Selection in the National List of Essential Medicines: Policy and Metabolic Considerations from a Clinician's Viewpoint

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ABSTRACT

The National List of Essential Medicines (NLEM) of India is a cornerstone policy tool designed to ensure equitable access to priority drugs. However, its current antidiabetic drug portfolio, comprising only glimepiride, insulin formulations, metformin, and teneligliptin, does not adequately address the heterogeneity and progressive nature of type 2 diabetes mellitus (T2DM). This manuscript examines the therapeutic and metabolic rationale for expanding the NLEM to include additional drug classes with distinct mechanisms of action and safety profiles. Evidence indicates that pancreatic-specific short-acting sulfonylureas (PSSA-SUs) such as glipizide and gliclazide deliver effective glycaemic control with fewer severe hypoglycaemic events compared to long-acting non-specific agents like glibenclamide. Gliclazide, in particular, offers sustained efficacy and a favourable side effect profile, while glipizide demonstrates enhanced postprandial insulin secretion in MODY and Non-Insulin-Dependent Diabetes Mellitus (NIDDM) [now known as type 2 diabetes mellitus (T2DM)] subgroups. Among α-glucosidase inhibitors, miglitol has shown superior reductions in postprandial glucose and HbA1c versus acarbose, alongside reduced glycaemic variability and inflammatory cytokine expression, although cost remains a barrier in some populations. For cases requiring intensive control (HbA1c >10%), repaglinide, a rapidly metabolised glinide, provides targeted postprandial glucose lowering with dosing flexibility, and pioglitazone, a thiazolidinedione, enhances insulin sensitivity and improves lipid profiles, particularly beneficial in insulin-resistant patients with cardiometabolic comorbidities. Cardiovascular risk, a leading cause of mortality in T2DM, can be mitigated by Glucagon-like peptide-1 (GLP-1) receptor agonists (liraglutide, dulaglutide, semaglutide), which have demonstrated significant cardiovascular event reduction, renal protection, weight loss, and superior glycaemic outcomes compared to several other glucose-lowering agents. Semaglutide, notably, outperforms liraglutide and exenatide in Haemoglobin A1C (HbA1c) reduction and weight loss, with all three agents reducing macroalbuminuria incidence. A clinician-focused metabolic analysis reveals that these agents offer advantages over standard therapies through mechanisms including postprandial control, insulin sensitisation, oxidative stress modulation, cardiovascular and renal protection, and minimal hypoglycaemia risk. While sodium-glucose co-transporter-2 (SGLT2) inhibitors show promise for integrated metabolic and cardiovascular risk reduction, concerns about long-term cardiovascular safety warrant further evaluation before NLEM inclusion. Expanding the NLEM to integrate these agents would create a more comprehensive, flexible, and evidence-driven therapeutic arsenal, enabling personalised treatment strategies to address the multifaceted pathophysiology of T2DM. This policy shift could optimise glycaemic control, reduce complications, consider affordability, accessibility, availability in India, cost-effectiveness, and improve patient outcomes in diverse Indian populations.

Keywords: Diabetes, India, NLEM, Pharmacotherapy

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INTRODUCTION

In the view of medicine and society, the National List of Essential Medicines (NLEM, India) serves as a guideline for providing essential drugs that meet priority healthcare needs.[1] Management of type 2 diabetes mellitus (T2DM) needs a multidimensional approach because of the very nature of the disease itself and the variations in its manifestations among individuals. Though insulin and metformin have been

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the cornerstone of treatment, they fail to cover the whole gamut of T2DM.[2] , the inclusion of pancreatic-specific short- or long-acting sulphonylureas (SUs), α-glucosidase inhibitors (AGIs), repaglinide and nateglinide (i.e., Glinides), pioglitazone & rosiglitazone (Thiazolidinediones or TZDs), liraglutide, lixisenatide, dulaglutide, semaglutide, albiglutide, exenatide (in Glucagon-like peptide-1 receptor agonists/GLP-1RAs), and canagliflozin, dapagliflozin, sotagliflozin, empagliflozin, and ertugliflozin (in SGLT2 inhibitors) complete the therapeutic strategy. However, the only drugs included in the NLEM are Glimepiride (from sulfonylureas), various forms of Insulin, Metformin, and Teneligliptin (in Dipeptidyl Peptidase IV/DPP-4 inhibitors).[3] In the above scenario, let's consider which other drugs we need to include in the NLEM list, keeping in mind that such inclusion should extend beyond comparative efficacy and safety, as it requires consideration of public-health relevance, affordability to patients and the healthcare system, accessibility, reliable availability within the supply chain, comparative cost-effectiveness, and feasibility of implementation across different levels of healthcare. Therefore, the therapeutic advantages discussed below should be interpreted alongside these policy and health-system considerations, particularly for newer and potentially higher-cost antidiabetic agents.

In terms of sulphonylureas, the available options in pancreatic non-specific long-acting SUs (PNSLA-SUs), other than glimepiride, include glibenclamide (glyburide, US-adopted name). In the case of pancreatic-specific short-acting SUs (PSSA-SUs), they include tolbutamide, glipizide, gliquidone, chlorpropamide, and gliclazide.[4–7] A recent meta-analysis considering the pharmacologic differences between sulfonylureas and the risk of adverse cardiovascular and hypoglycaemic events found that there was no difference in the risk of major cardiovascular adverse events, cardiovascular death, and all-cause mortality between PNSLA-SUs and PSSA-SUs. However, PNSLA-SUs (where Glyburide or glibenclamide has not been included in NLEM 2022) had an increased risk of severe hypoglycaemia.[7,3] Therefore, in such a setup, the choice of an alternative (from PSSA-SUs) and its addition to NLEM is deemed to be necessary. From PSSA-SUs, head-to-head comparison between tolbutamide and glipizide in maturity-onset diabetes of the young or MODY (i.e., a subtype of Non-Insulin-Dependent Diabetes Mellitus/NIDDM/T2DM) indicated that, while both increased insulin sensitivity to endogenous insulin, only the latter showed a significant increase ($p<0.025$) in insulin secretion after food intake. Additionally, while tolbutamide and glipizide seemed to act primarily by enhancement of sensitivity to endogenous insulin, only glipizide imparted a chronic anti-hyperglycaemic effect upon insulin secretion.[8] ; therefore, glipizide may warrant consideration for inclusion in NLEM 2025. However, a later study comparing the efficacy of gliclazide with other SUs (i.e., chlorpropamide, glipizide, gliquidone) in patients with diet-failed NIDDM (now T2DM) reported that gliclazide had a comparable potency to that of other SUs, along with having a low side effect profile, including few incidences of hypoglycaemia, while retaining its anti-hyperglycaemic efficacy for a longer duration of time.[9] Thus, gliclazide may be a more suitable option for the treatment of NIDDM (now T2DM), including MODY, as suggested by the results of the recent 2023 "Glucagon In MODY" study (NCT03246828).[10]

As per Indian Council of Medical Research (ICMR) guidelines, an HbA1c between 8.5%-10% demands treatment with metformin and SUs/TZD/DPP-4I/SGLT2/AGIs/GLP-1Ras.[11] While for SUs and DPPIs, agents (with teneligliptin already included in NLEM) have been discussed above, research indicates that AGIs (i.e., miglitol or acarbose) may have an important role to play as an add-on therapy when first-line drugs like SUs and metformin fail to control the hyperglycaemia, as shown in a prospective, randomised, patient-controlled, open-label comparative clinical trial (n=50, T2DM patients with 18 months follow-up). However, when comparing the potency of miglitol and acarbose, miglitol produced a mean reduction of postprandial blood glucose (PPBS) of 34.12 ± 4.89% while values for acarbose stood at 30.61 ± 5.86%. Furthermore, the % change in Haemoglobin A1c (HbA1c) with miglitol stood at 0.58 ± 0.05 g%, but for acarbose it was 0.47 ± 0.09 g%. Thus, clearly indicates that miglitol demonstrated potential advantages as an add-on therapy compared with acarbose in terms of glycaemic control in patients with uncontrolled T2DM, even after treatment with SUs (glimepiride-4mg) and biguanides (metformin-2g) for at least 3 months.[12] Moreover, miglitol has been studied to be an effective minimiser of glucose fluctuations while decreasing the expression of inflammatory cytokines and cytokine-like factors in peripheral leukocytes of patients with T2DM when compared to other AGIs, in addition to causing fewer side effects.[13] If these reasons were not sufficient to include miglitol in NLEM 2025 (or later), a cost-analysis study between the two AGIs research into the cost-effectiveness between the two AGIs indicates that while miglitol is the most effective option for treatment, in most cases, relatively less affordable and accessible, limiting the use of this drug in some populations and barring them from an effective management/control of T2DM.[14] Now, in cases where HbA1c>10%, ICMR recommends the use of basal insulin along with the use of metformin and other oral anti-diabetic agents (OAD)/triple combination of OAD.[11] In these situations, the use of glinides, especially repaglinide, appears to be a valuable therapeutic option when compared with other OADs.[15] Similarly, in cases of more complex cases, such as insulin-resistant T2DM patients having dyslipidaemia, hypertension, or a history of cardiovascular disease, pioglitazone may represent a therapeutic option.[16]

Besides, cardiovascular diseases (CVDs) are among the main causes of fatality in patients with T2DM, particularly in low-

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and middle-income countries.[17] In this context, GLP-1 receptor agonists represent an additional glucose-lowering therapeutic class with demonstrated cardiovascular benefits in selected populations with T2DM. Liraglutide, which is administered by subcutaneous injection, demonstrated cardiovascular benefit in the LEADER trial (n=9,340; patients followed up for 3.8 years, NCT01179048). CVD outcomes such as time-to-event analysis (p=0.01 for superiority, p<0.001 for non-inferiority), the rate of the first occurrence of death from cardiovascular causes (p=0.007), nonfatal myocardial infarction, or nonfatal stroke in patients with T2DM were lower with liraglutide than with placebo.[18] Interestingly, a recent meta-analysis showed that all GLP-1 RAs (i.e., liraglutide, lixisenatide, dulaglutide, semaglutide, albiglutide, exenatide) were compared head-on for their safety and efficacy, semaglutide was statistically superior (p<0.0001) to exenatide (2 mg QW; SUSTAIN-3 trial) and Liraglutide (1.2 mg QD; SUSTAIN-10 trial), in terms of glycaemic control and weight loss, whereas in the case of incidence of cardiovascular death administration of a combination of semaglutide (p=0.021; 14 mg, once daily; PIONEER-6 trial), along with liraglutide (p=0.007; s.c. injection, 1.8 mg, once daily; LEADER trial), reduced the incidence of cardiovascular death. Surprisingly, semaglutide (p= 0.001; SUSTAIN-6 trial), dulaglutide (p<0.0001; REWIND trial), and liraglutide (p=0.004; LEADER trial) were beneficial in terms of reduced incidence of new or persistent macroalbuminuria.[19] In addition, 2/3rd of patients with T2DM have arterial hypertension, which increases the incidence of micro- and macrovascular complications.[20] Moreover, elevated systolic blood pressure, having a genetic linkage, has been observed to be associated with an increased risk for type 2 diabetes.[21] Therefore, in such a setting, SGLT2 inhibitors represent an important glucose-lowering therapeutic class with potential cardiorenal benefits in appropriately selected patients with T2DM. A Japanese real-world study.[22] reported differences in cardiovascular outcomes among individual SGLT2 inhibitors; however, findings from a single observational population should not be generalised to establish a class-wide cardiovascular safety concern. Evaluation of SGLT2 inhibitors for potential NLEM inclusion should therefore consider the broader evidence base, individual agents, relevant patient populations, adverse-effect profiles, affordability, accessibility, and comparative cost-effectiveness. Therefore, much research is needed if we opt for establishing SGLT2 inhibitors as a viable option for treating T2DM. Thus, to conclude, NLEM currently includes a limited set of antidiabetic drugs for managing T2DM, namely glimepiride, various insulin formulations, metformin, and teneligliptin.

From a clinician's standpoint, the metabolism profiles of these antidiabetic drugs vary substantially, influencing efficacy and safety: gliclazide is extensively metabolised with minimal renal clearance and offers superior long-term glycaemic durability, lower secondary failure rates, and less hypoglycaemia compared to older sulfonylureas like glipizide, which undergoes hepatic metabolism but is associated with more frequent secondary failure. Both stimulate insulin via pancreatic ß-cell K_{ATP} (ATP-sensitive potassium channels) channel blockade, but gliclazide's selective binding to Sulfonylurea receptor 1 (SUR1) and extra-pancreatic antioxidant effects confer a safer profile. Miglitol acts as an alpha-glucosidase inhibitor, targeting intestinal carbohydrate absorption to blunt postprandial glucose excursions and HbA1c, while also reducing glucose variability and inflammation, thus reducing the rise of postprandial glucose with fewer gastrointestinal side effects when compared to acarbose. Repaglinide, a glinide, is rapidly metabolised hepatically, primarily by Cytochrome P450 3A4 (CYP3A4), and allows flexible meal dosing, providing strong postprandial glucose control without sulfonylurea-associated persistent insulin stimulation. Pioglitazone is metabolised mainly in the liver by Cytochrome P450 2C8 (CYP2C8) and CYP3A4, improving insulin sensitivity and lipid profiles with a less direct hypoglycaemic action. Liraglutide, dulaglutide, and semaglutide, GLP-1 RAs, are peptides degraded proteolytically and largely avoid renal excretion; they exert superior glycaemic, weight, and cardiovascular benefits relative to sulfonylureas due to their non-insulinotropic mechanism and minimal risk of hypoglycaemia. Collectively, these agents surpass many traditional drugs in metabolic flexibility, durability, and safety, promoting individualized treatment options for T2DM.

Therefore, to conclude, given the multidimensional nature of T2DM, expanding the NLEM to include additional therapeutic options is essential to address diverse patient needs. This expansion should consider alternatives such as PSSA-SUs, like glipizide and gliclazide, which offer effective glycaemic control with fewer adverse effects compared to existing options. Similarly, AGIs, specifically miglitol, have shown superior efficacy in reducing postprandial blood glucose and HbA1c compared to acarbose, making them valuable for add-on therapy when first-line treatments fail. For cases with HbA1c >10%, repaglinide (a glinide) and pioglitazone (a thiazolidinedione) demonstrate significant therapeutic potential, especially for insulin-resistant patients with cardiovascular comorbidities. Furthermore, GLP-1 RAs such as liraglutide, dulaglutide, and semaglutide offer cardiovascular benefits and improved glycaemic control, justifying their inclusion in future NLEM updates. Below is a list of medications to be included in NLEM based on affordability in the Indian setting, accessibility, availability in India, and cost-effectiveness.[23–29,5–6]

Finally, while SGLT2 inhibitors hold promise, further research is needed to fully validate their cardiovascular safety in broader populations. This becomes more evident in a scenario where potential NLEM inclusion should also account for class-specific limitations. Sulfonylureas remain associated with

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Table 1: Policy comparison for NLEM inclusion in India

Drug	Affordability in Indian setting	Accessibility	Availability in India	Cost-effectiveness	Key limitations relevant to NLEM	Overall case for NLEM inclusion
Glipizide	High – relatively inexpensive generic; PMBJP has listed glipizide + metformin, and historical NPPA pricing shows low unit prices.	High for oral therapy; generic formulations accessible through private market and generic channels	Moderate–High; commercially available, although individual glipizide availability is less prominent than glimepiride	High–Moderate – inexpensive, effective sulfonylurea; Indian data show low treatment cost	Hypoglycaemia and weight gain; less compelling differentiation from already-listed glimepiride	Moderate–High – reasonable candidate, particularly if a second sulfonylurea is considered necessary; however, therapeutic duplication with glimepiride should be justified
Gliclazide	High–Moderate – PMBJP lists gliclazide SR 60 mg at ₹37.62/10 tablets versus average ₹104.66 for leading brands	High in the private/generic market	High – established Indian market and PMBJP availability	High – favourable cost relative to several newer therapies; Indian cost studies support relatively favourable economics	Hypoglycaemia and weight gain remain concerns; evidence for superiority over all other SUs should not be overstated	High – stronger candidate than glipizide for consideration because of established availability, affordability and favourable clinical profile
Miglitol	Moderate – generic availability exists, but cost is higher than some conventional oral agents.	Moderate	Moderate – available but less commonly positioned than acarbose/voglibose	Moderate–Low – clinical benefit exists, but additional cost versus inexpensive AGIs needs justification	Gastrointestinal adverse effects; comparatively modest HbA1c effect; alternatives such as acarbose/voglibose are already widely available	Low–Moderate – requires stronger Indian comparative cost-effectiveness and public-health justification before inclusion
Repaglinide	High–Moderate – generally inexpensive generic oral therapy	High–Moderate	High–Moderate – established oral antidiabetic market	Moderate–High – relatively low acquisition cost and flexible meal-related dosing	Hypoglycaemia, weight gain and multiple daily dosing; limited additional essentiality compared with existing options	Moderate – potentially useful in selected patients, but incremental benefit over existing NLEM agents needs to be demonstrated
Pioglitazone	High – low-cost generic; Indian ICMR-RUMC data showed substantially lower generic than branded costs	High	High – widely marketed and inexpensive	High–Moderate – low acquisition cost and established efficacy; Indian economic analyses support inexpensive use	Weight gain, oedema/fluid retention and heart-failure concerns; patient selection important	Moderate–High – economically attractive, but safety concerns mean inclusion should be accompanied by clear res trictions/appropriate-use guidance.
Liraglutide	Low–Moderate – branded therapy remains expensive; generic competition is emerging.	Moderate – primarily s pecialist/private-sector access	Moderate–High in urban/private markets; injectable and cold-chain requirements constrain access	Moderate/Uncertain in Indian NLEM context – cardiovascular benefit may offset cost in selected high-risk patients, but broad population cost-effectiveness is less certain	High cost, injection, GI adverse effects, cold-chain requirements; multiple competing GLP-1 RAs	Moderate–Low for broad NLEM inclusion; potentially consider for restricted/high-risk indications rather than universal inclusion

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Table 1: (Continued)

Drug	Affordability in Indian setting	Accessibility	Availability in India	Cost-effectiveness	Key limitations relevant to NLEM	Overall case for NLEM inclusion
Dulaglutide	Low–Moderate – approximately ₹5,000–5,700 per pack of two pens for commonly marketed strengths; substantially costlier than conventional oral agents	Moderate – specialist/ private-sector access; injectable/cold-chain	Moderate–High – commercially available, with multiple marketed products	Moderate/Uncertain for broad Indian NLEM inclusion; potential cardiorenal benefits improve its value in selected populations	Cost, injectable administration, GI effects, and cold-chain requirements	Moderate–Low for unrestricted NLEM inclusion; stronger case for targeted/high-risk use if economic evidence improves
Semaglutide	Improving rapidly – generic semaglutide entered India after patent expiry in March 2026; some manufacturers launched at approximately ₹1,290–1,750/month for vial formulations.	Moderate–High and rapidly expanding.	High and rapidly increasing; numerous Indian manufacturers entered the market in 2026	Potentially Moderate–High, but Indian real-world cost-effectiveness evidence remains limited; dramatic generic price reduction changes the previous affordability assessment.	GI adverse effects, injection/oral administration depending on formulation, cold chain for injectables, quality/appropriate-use monitoring	Moderate currently; potentially High in future if lower generic prices persist and Indian cost-effectiveness/ real-world evidence supports population-level value.

Note: PMBJP: Pradhan Mantri Bhartiya Janaushadhi Pariyojana; NPPA: National Pharmaceutical Pricing Authority; ICMR: Indian Council of Medical Research; RUMC: Rational Use of Medicines Centres

hypoglycaemia and weight gain, although these risks vary among individual agents. α-Glucosidase inhibitors commonly produce gastrointestinal adverse effects that may affect adherence. Glinides can cause hypoglycaemia and require meal-related dosing. Pioglitazone is associated with weight gain, fluid retention and oedema and requires careful patient selection, particularly in individuals at risk of heart failure. GLP-1 receptor agonists frequently cause gastrointestinal adverse effects and may be limited by cost, injectable administration for most agents, and access considerations. SGLT2 inhibitors are associated with adverse effects including genital mycotic infections and volume depletion, with less common but clinically important risks requiring appropriate patient selection and counselling. These limitations should be considered alongside efficacy, cardiovascular and renal outcomes, affordability, accessibility, and cost-effectiveness when evaluating individual agents for future NLEM inclusion.

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CONFLICT OF INTEREST

None

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ABBREVIATIONS

AGI/AGIs: Alpha-glucosidase inhibitor(s); ATP: Adenosine triphosphate; CVD/CVDs: Cardiovascular disease(s); CYP2C8: Cytochrome P450 2C8; CYP3A4: Cytochrome P450 3A4; DPP-4I: Dipeptidyl peptidase-4 inhibitor; GLP-1 RA/GLP-1 RAs: Glucagon-like peptide-1 receptor agonist(s); HbA1c: Glycated haemoglobin A1c; ICMR: Indian Council of Medical Research; KATP: ATP-sensitive potassium channel; MODY: Maturity-onset diabetes of the young; NCT: National Clinical Trial; NIDDM: Non-insulin-dependent diabetes mellitus; NLEM: National List of Essential Medicines; NPPA: National Pharmaceutical Pricing Authority; OAD/OADs: Oral antidiabetic drug(s);

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PMBJP: Pradhan Mantri Bhartiya Janaushadhi Pariyojana; PNSLA-SU(s): Pancreatic non-specific long-acting sulfonylurea(s); PSSA-SU(s): Pancreatic-specific short-acting sulfonylurea(s); PPBS: Postprandial blood glucose; QD: Once daily; QW: Once weekly; RUMC: Rational Use of Medicines Centres; s.c.: Subcutaneous; SGLT2: Sodium-glucose co-transporter-2; SU(s): Sulfonylurea(s); SUR1: Sulfonylurea receptor 1; T2DM: Type 2 diabetes mellitus; TZD(s): Thiazolidinedione(s).

REFERENCES

1. Sindhwani R, Bora KS, Hazra S. Integrating obesity medicines in the national list of essential medicines: a policy concern. *Curr. Sci.* (00113891). 2024;*127*(6):660-661. Available at: https://www.currentscience.ac.in/Volumes/127/06/0660.pdf
2. Rojas LB, Gomes MB. Metformin: an old but still the best treatment for type 2 diabetes. *Diabetol. Metab. Syndr*. 2013;*5*(1):6. doi: 10.1186/1758-5996-5-6
3. CDSCO, National List of Essential Medicines 2022. 2024; https://cdsco.gov.in/opencms/opencms/en/consumer/Essential-Medicines/ (accessed on 2024 Nov. 15).
4. Truncate to Sola D, Rossi L, Schianca GP, Maffioli P, Bigliocca M, Mella R, et al.; Sulfonylureas and their use in clinical practice. *Arch Med Sci.* 2015;*11*(4):840-8.
5. Hardin & Jacobs, Glyburide (StatPearls): [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK545313
6. Costello et al., Sulfonylureas (StatPearls): [Updated 2023 Jul 12]. [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK513225/
7. Douros A, Yin H, Yu OHY, Filion KB, Azoulay L, Suissa S. Pharmacologic Differences of Sulfonylureas and the Risk of Adverse Cardiovascular and Hypoglycemic Events. *Diabetes Care.* 2017;*40*(11):1506-1513. doi: 10.2337/dc17-0595
8. Fineberg SE, Schneider SH. Glipizide versus tolbutamide, an open trial. Effects on insulin secretory patterns and glucose concentrations. *Diabetologia.* 1980;*18*(1):49-54. doi:10.1007/BF01228302
9. Harrower AD. Efficacy of gliclazide in comparison with other sulphonylureas in the treatment of NIDDM. *Diabetes Res Clin Pract.* 1991;*14*(Suppl 2):S65-S67. doi: 10.1016/0168-8227(91)90010-b
10. Spiliotis II, Anguelova L, Kavvoura F, Owen K. OR34-06 Gliclazide Restores Appropriate Glucagon Suppression During OGTT In MODY3 & MODY1 Patients: Results Of The "Glucagon In MODY" Study. *J Endocr Soc.* 2023;*7*(Suppl 1):bvad114.1045. doi: 10.1210/jendso/bvad114.1045
11. Standard Treatment Workflow-Diabetes Mellitus Type 2 (ICD-10-E11), ICMR, 2024; https://www.icmr.gov.in/icmrobject/uploads/STWs/1726567245_diabetes_mellitus_type_2.pdf (accessed on 2024 Dec. 16).
12. Choudhury LD, Basu R, Biswas T, Mukherjee A, Das AK. A comparative study of miglitol and acarbose add-on therapy intended for better glycaemic control in type 2 diabetes mellitus. *Int J Cur Res Rev*. 2016;*8*(24):33.
13. Osonoi, T., Saito, M., Mochizuki, K., Fukaya, N., Muramatsu, T., Inoue, S., Fuchigami, M., & Goda, T. The α-glucosidase inhibitor miglitol decreases glucose fluctuations and inflammatory cytokine gene expression in peripheral leukocytes of Japanese patients with type 2 diabetes mellitus. *Metabolism.* 2010;*59*(12):1816-1822. doi: 10.1016/j.metabol.2010.06.006
14. Thacker KS, Mistry VR, Kanani NJ; Oral Antidiabetic Agents Available In Indian Pharmaceutical Market: A Price Variation Analysis. *Asian J Pharm Clin Res.* 2020;*13*(3):143-7. doi: 10.22159/ajpcr.2020.v13i3.36498
15. Richard JW, Raskin P. Updated Review: Improved Glycemic Control with Repaglinide-Metformin in Fixed Combination for Patients with Type 2 Diabetes. *Clin. Med. Insights Endocrinol. Diabetes*. 2011;*4*:29-37. doi: 10.4137/CMED.S5094
16. Alam F, Islam MA, Mohamed M, et al. Efficacy and Safety of Pioglitazone Monotherapy in Type 2 Diabetes Mellitus: A Systematic Review and Meta-Analysis of Randomised Controlled Trials. *Sci Rep.* 2019;*9*(1):5389. doi:10.1038/s41598-019-41854-2
17. Ma CX, Ma XN, Guan CH, Li YD, Mauricio D, Fu SB. Cardiovascular disease in type 2 diabetes mellitus: progress toward personalized management. *Cardiovasc Diabetol.* 2022;*21*(1):74. doi: 10.1186/s12933-022-01516-6
18. Marso, S. P., Daniels, G. H., Brown-Frandsen, K., Kristensen, P., Mann, J. F., Nauck, M. A., Nissen, S. E., Pocock, S., Poulter, N. R., Ravn, L. S., Steinberg, W. M., Stockner, M., Zinman, B., Bergenstal, R. M., Buse, J. B., LEADER Steering Committee, & LEADER Trial Investigators. Liraglutide and Cardiovascular Outcomes in Type 2 Diabetes. *N Engl J Med.* 2016;*375*(4):311-322. doi: 10.1056/NEJMoa1603827
19. Hu EH, Tsai ML, Lin Y, Chou TS, Chen TH. A Review and Meta-Analysis of the Safety and Efficacy of Using Glucagon-like Peptide-1 Receptor Agonists. *Medicina (Kaunas)*. 2024;*60*(3):357. doi: 10.3390/medicina60030357
20. Pavlou, D. I., Paschou, S. A., Anagnostis, P., Spartalis, M., Spartalis, E., Vryonidou, A., Tentolouris, N., & Siasos, G. Hypertension in patients with type 2 diabetes mellitus: Targets and management. *Maturitas.* 2018;*112*:71-77. doi: 10.1016/j.maturitas.2018.03.013
21. Aikens, R. C., Zhao, W., Saleheen, D., Reilly, M. P., Epstein, S. E., Tikkanen, E., Salomaa, V., & Voight, B. F. Systolic Blood Pressure and Risk of Type 2 Diabetes: A Mendelian Randomization Study. *Diabetes.* 2017;*66*(2):543-550. doi: 10.2337/db16-0868
22. Suzuki, Y., Kaneko, H., Okada, A., Itoh, H., Matsuoka, S., Fujiu, K., Michihata, N., Jo, T., Takeda, N., Morita, H., Kamiya, K., Matsunaga, A., Ako, J., Node, K., Yasunaga, H., & Komuro, I. Comparison of cardiovascular outcomes between SGLT2 inhibitors in diabetes mellitus. *Cardiovasc Diabetol.* 2022;*21*(1):67. doi: 10.1186/s12933-022-01508-6
23. Correa R, Patel P, Nappe TM. Glipizide. [Updated 2025 Nov 28]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459177
24. Milner Z, Akhondi H. Repaglinide. [Updated 2023 Jul 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK559305
25. Can AS, Correa R. Pioglitazone. [Updated 2023 Jul 4]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK544287
26. Akmal M, Patel P, Wadhwa R. Alpha Glucosidase Inhibitors (StatPearls): [Updated 2024 Feb 28]. [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK557848
27. Cerillo JL, Parmar M. Liraglutide. [Updated 2024 Oct 6]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK608007
28. Collins L, Costello RA. Glucagon-Like Peptide-1 Receptor Agonists. [Updated 2024 Feb 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK551568
29. Latif W, Lambrinos KJ, Patel P, Rodriguez R. Compare and Contrast the Glucagon-Like Peptide-1 Receptor Agonists (GLP1RAs). [Updated 2024 Feb 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. Available from: https://www.ncbi.nlm.nih.gov/books/NBK572151

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