

RSSDI Indian Diabetes

EDUCATOR JOURNAL



Theme of the Month

Diabetes and Cancer

To keep Members of Diabetes Care team abreast about
DSME/DSMS - (Diabetes Self management Education/Support) Concepts

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FOREWORD

Research Society for the Study of Diabetes in India (RSSDI) founded by Prof MMS Ahuja in the year 1972 is the biggest scientific association of healthcare professionals involved in promoting diabetes education and research in India. RSSDI is happy to collaborate with USV to support their endeavour to make India the 'Diabetes care capital of the world'. Through this collaboration, RSSDI would like to strengthen the cadre of diabetes educators by empowering them with recent updates in diabetes management helping bridge the gap between the physician and the patient. Today, the rule of 50% is prevailing in terms of awareness, detection, treatment and control in T2DM. Our aspiration is to achieve 90-90-90-90 i.e. 90% of people with diabetes should be made aware, 90% should be detected, 90% of those detected should be treated, and 90% of those treated should reach their goals.

Indian Diabetes Educator Journal (IDEJ) is the first of its kind in India, and the longest running monthly diabetes educator journal since April 2015 & continues its endeavour to spread awareness, knowledge and enable healthcare teams to manage individuals with diabetes and empower them for self-care. RSSDI IDEJ will continue to keep the members of diabetes care team abreast with concepts of Diabetes Self-Management Education/Support (DSME/S) with a reach of 44000 doctors and diabetes educators digitally.

World Cancer Day is observed every year on February 4th as a global initiative aimed at raising awareness about cancer and promoting early detection and prevention. People with diabetes are at an increased risk for cancer. This month's IDEJ aims at elucidating the interplay between diabetes and cancer. We hope this issue will support diabetes educators to help their patients with the prevention and management of cancer along with achieving good glycemic control.

We sincerely thank our contributors for making this issue delightful reading for our readers. We dedicate this journal to all the healthcare professionals who are working relentlessly towards making "India-The Diabetes Care Capital of the World."

Sincere Regards,

Dr. Sanjay Agarwal
RSSDI Secretary

Disclaimer: This Journal provides news, opinions, information and tips for effective counselling of people with diabetes. This Journal intends to empower your clinic support staffs for basic counselling of people with diabetes. This journal has been made in good faith with the literature available on this subject. The views and opinions expressed in this journal of selected sections are solely those of the original contributors. Every effort is made to ensure the accuracy of information but Hansa Medcell or USV Private Limited will not be held responsible for any inadvertent error(s). Professional are requested to use and apply their own professional judgement, experience and training and should not rely solely on the information contained in this publication before prescribing any diet, exercise and medication. Hansa Medcell or USV Private Limited assumes no responsibility or liability for personal or the injury, loss or damage that may result from suggestions or information in this book.

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Article: All About Type 3c Diabetes



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Cover Story: Interplay of Diabetes and Cancer



Dr. Suresh Ranka

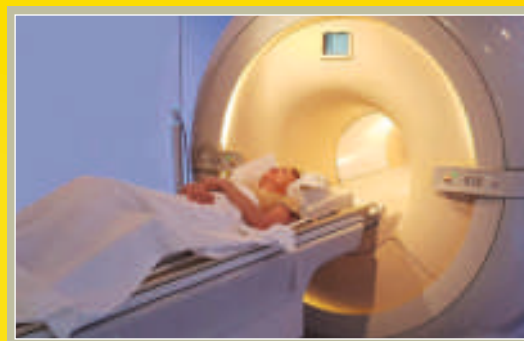
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Cancer and diabetes mellitus are commonly coexisting conditions, and the global incidence of both is rising. Cancer patients with diabetes face unique challenges that involve the concurrent use of steroids, which may aggravate preexisting diabetes. Evidence suggests that cancer patients with diabetes have higher cancer-related mortality, and

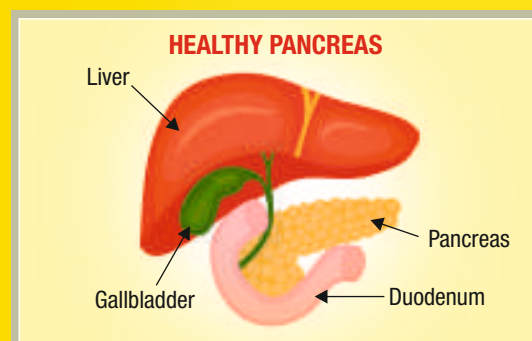
people with diabetes are at an increased risk of various infections and related morbidity and mortality. Hence, people with diabetes should be strongly encouraged by their healthcare professionals to undergo appropriate cancer screenings as recommended for all people of their age and sex.

Diabetes mellitus is a risk factor for certain types of malignancies such as pancreatic, liver, colon, breast, and endometrial cancer. The association between diabetes and some cancers could partly be due to shared risk factors, such as aging, obesity, diet, and physical inactivity. Increased risk of cancer in patients with diabetes has also been attributed to various factors such as hyperglycemia, insulin resistance, hyperinsulinemia, insulin-like growth factor-1 (IGF-1) levels, inflammatory cytokines, dyslipidemia, dysregulations of sex hormones, oxidative stress, increased



leptin, and decreased adiponectin. Elevated blood glucose levels lead to the proliferation of various solid tumor cell lines. As insulin is transported to the liver via the portal vein following release from pancreatic β -cells, both the liver and pancreas are exposed to a high insulin concentration.

Underlying obesity associated with diabetes also has cancer-promoting effects secondary to increased peripheral estrogens, increased pro-mitogen cytokines, and growth factors related to excess fat tissue. Furthermore, fat-associated chronic inflammation, the release of inflammatory cytokines, and the generation of reactive oxygen species (ROS) result in cell damage, cancer growth, and invasiveness.



Diabetes may negatively influence prognosis due to other associated comorbidities, and the risk of non-cancer-related causes of death. Elevated concentrations of circulating insulin and continuous exposure to hyperglycemia stimulate cancer growth and progression, leading to poorer prognosis. Multidisciplinary management of diabetes in individuals requiring cancer treatment, involves a diabetes specialist, educator, dietician, pharmacist, and psychosocial support professional, in collaboration with the cancer care team. This is vital to avoid diabetes-related complications and thereby inferior outcomes. People with diabetes on anticancer therapy require management of hyperglycemia, fluids, electrolytes, hypertension, cardiovascular complications, infections, and autonomic neuropathy of the gastrointestinal tract. Other important components of the management of diabetes in cancer patients include patient education and self-management training, interdisciplinary team counseling, home blood glucose monitoring, monitoring side effects, and the patient's adherence to prescribed treatment.

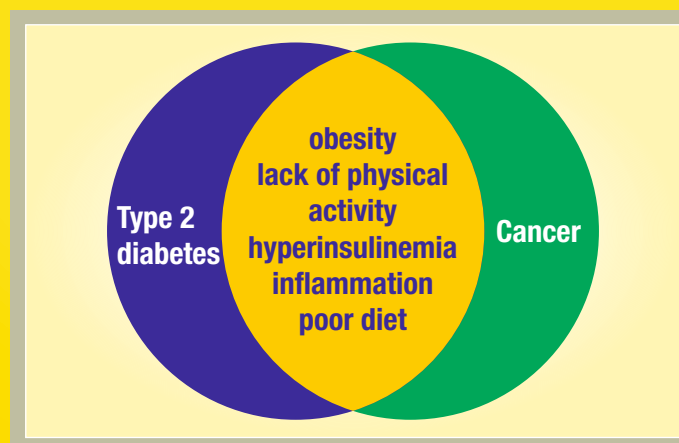
In addition to poorly controlled blood glucose, the choice of anticancer therapy in people with diabetes could be influenced by underlying chronic renal insufficiency, cardiovascular disease, peripheral neuropathy, and chronic infection. These factors limit the use of certain drugs or their dosage, leading to lower response rates, inferior outcomes, and shorter survival.

A further detailed understanding of the underlying mechanism between diabetes and cancer risk is required along with large prospective, biomarker-driven population-based studies to explore the causal relationship between the duration and/or severity of diabetes and different types of cancers. Conclusive evidence may also help implement primary prevention, early detection/screening, and effective therapeutic measures. In addition, the promotion of physical activity, a healthy diet, and maintaining optimal body weight are also important in diabetes cancer survivors. A patient-centered approach by a multidisciplinary team comprised of various healthcare professionals and the development of clinical pathways is vital to co-manage diabetes and cancer, avoiding diabetes-related complications and improving health outcomes.



Key takeaway points

- Diabetes is associated with an increased risk of certain cancers such as pancreatic, liver, colon, breast, and endometrial cancer.
- Both diabetes and cancer share common risk factors, such as obesity and poor lifestyle.
- Diabetes can create a pro-inflammatory and insulin-resistant environment in the body, potentially promoting cancer development and progression.
- Diabetes may negatively influence the prognosis of cancer and good blood glucose control is essential for successful cancer treatment.
- Multidisciplinary management is essential in individuals living with dual diagnosis of diabetes and cancer.
- More research on how these conditions influence each other can provide insights into potential shared pathways for targeted interventions.



Resources:

1. Giovannucci E, Harlan DM, Archer MC, *et al.* Diabetes and cancer: a consensus report. *Diabetes Care*. 2010;33(7):1674-1685. doi:10.2337/dc10-0666.
2. Shahid RK, Ahmed S, Le D, Yadav S. Diabetes and Cancer: Risk, Challenges, Management and Outcomes. *Cancers (Basel)*. 2021;13(22):5735. Published 2021 Nov 16. doi:10.3390/cancers13225735.
3. Stevens C, Dinkel S, Catanzaro J. The complex dual diagnosis of diabetes and cancer. *Clin J Oncol Nurs*. 2011;15(6):654-658. doi:10.1188/11.CJON.654-658.



Impact of Cancer Therapies on Blood Glucose Levels



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There are various modes of cancer treatment. These can have an impact on the blood glucose control for those having diabetes. Close monitoring of blood glucose levels is essential for all people living with diabetes undergoing cancer treatment. Here are a few ways in which treatment modalities can impact blood glucose levels.

Chemotherapy

One popular cancer treatment is chemotherapy, or "chemo." Chemotherapy shrinks or kills cancer cells, but some healthy cells are damaged in the process. Side symptoms include dry mouth, oral sores, nausea, vomiting, and appetite loss might result from damage to healthy cells. Because of these adverse effects, eating may be difficult or the body may not be able to absorb the meal, which can cause the blood glucose to drop too low.



Radiation therapy



Another kind of treatment for cancer is radiation therapy. This therapy uses high-energy radiation, which is comparable to X-rays, to destroy cancer cells. Blood glucose levels can rise as a result of radiation therapy because the body releases more glucose to withstand the treatment. Fatigue is one of the negative effects of this therapy. Compliance with diet and activity programs that support diabetes management may be difficult when extremely fatigued.

Hormone therapy

Prostate and breast cancer are frequently treated with hormone treatment. With this treatment, the hormones required for cancer cells to proliferate are prevented. However, it may have unfavorable side effects including fatigue and nausea, which may deplete the ability to continue exercising or eating healthy meals.



Steroid medications



In order to alleviate pain and nausea associated with cancer and its treatment, the doctor may recommend steroids. Alternatively, steroids might be a component of the cancer's own treatment. Steroids can raise insulin resistance, which raises blood glucose levels. This indicates that the body is not using insulin as it should. Steroids that are frequently used are methylprednisolone, hydrocortisone, prednisone, and dexamethasone (all of these have several brand names). Steroids may be administered intravenously (IV) over a longer period or in multiple smaller doses rather than one larger dosage to help maintain stable blood glucose levels. It could be necessary to start using insulin or to increase its dosage while receiving steroid therapy.

Targeted therapies

Numerous targeted treatments have the ability to alter the cellular mechanisms governing the body's utilization of insulin. Examples include ABL kinase inhibitors like nilotinib (Tasigna) and mTOR kinase inhibitors like everolimus (Afinitor, Zortress).



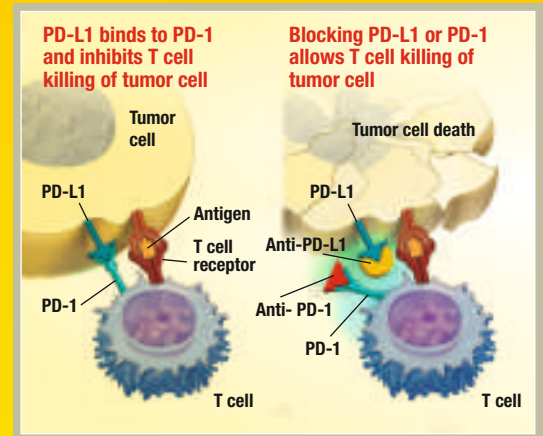
Immunotherapy

Drugs used in immunotherapy may have an impact on glucose levels. Among these are medications that bind to the PD-1 protein. Among these are nivolumab (Opdivo) and pembrolizumab (Keytruda).

Surgery



The doctor would want to make sure that the blood glucose level is in controlled range before surgery, as high blood glucose levels would cause the wounds to heal slower, thereby increasing the risk of infection.



Key takeaway points

- Blood glucose levels are impacted by treatment modalities of cancer.
- Side effects of chemotherapy, radiation, and hormone therapy like nausea, loss of appetite, and fatigue may lead to decreased food intake, increasing the risk of hypoglycemia.
- Use of steroids and targeted therapies can lead to insulin resistance causing hyperglycemia.
- Good control of blood glucose during cancer treatment is essential for preventing infections.

Resources:

1. Managing diabetes when you have cancer. Cancer.Net. October 15, 2021. Accessed November 20, 2023. <https://www.cancer.net/navigating-cancer-care/when-cancer-not-your-only-health-concern/managing-diabetes-when-you-have-cancer#:~:text=Some%20cancer%20treatments%20and%20their,severe%20cancer%20treatment%20side%20effects>
2. I have diabetes and cancer. what can I eat? Centers for Disease Control and Prevention. October 11, 2022. Accessed November 20, 2023. https://www.cdc.gov/diabetes/library/features/diabetes_cancer.html

All About Type 3c Diabetes



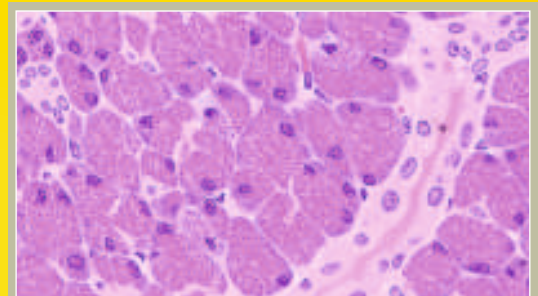
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Type 3c diabetes is the term used in contemporary research to characterize diabetes mellitus caused by illnesses of the exocrine pancreas, which was previously referred to as pancreatogenic or pancreatogenous diabetes mellitus. When the pancreas is injured and unable to produce enough insulin for the body, type 3c diabetes can occur.

Chronic pancreatitis is most frequently found to be the cause of type 3c diabetes. Pancreatic ductal adenocarcinoma, hemochromatosis, cystic fibrosis, and prior pancreatic surgery are among the other reasons for type 3c diabetes. If a person has any other kind of injury that results in the removal of the pancreas, it may potentially lead to type 3c diabetes.



Pancreatic acinar cells

Prevalence

Estimates of the prevalence of type 3c diabetes, which frequently coexists with chronic pancreatitis, range from 25 to 80%.

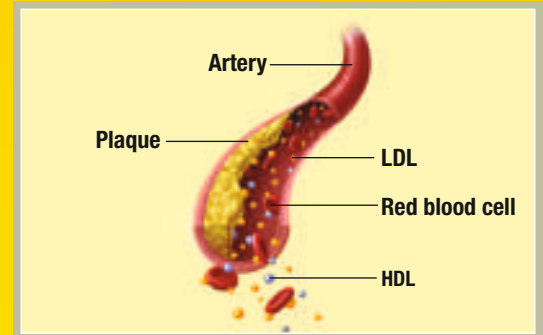
Diagnosis

Even though type 3c diabetes is distinct from other kinds, it is sometimes misdiagnosed as type 2 due to its lack of awareness. In theory, people who satisfy the three requirements listed below can be diagnosed: those who satisfy the diagnostic standards for diabetes; those who have an exocrine pancreatic disease; and those whose diabetes is most likely attributable to their exocrine pancreatic condition. The age at which diabetes first appears is typically between 38 and 53 years old in cases of genetic pancreatitis; however, in acquired forms of chronic pancreatitis, this period is less clearly defined.



Complications

Obesity, smoking, hypertension, and hyperlipidemia should all be investigated in conjunction with type 3c diabetes since they are predicted to affect target organ problems. The combination of diabetes mellitus and chronic pancreatitis may raise concerns for the evolution of pancreatic ductal adenocarcinoma because both conditions are risk factors for the disease. Research also revealed a higher, albeit less significant, risk ratio (4.7-12.1) for pancreatic ductal adenocarcinoma in those with a history of chronic pancreatitis and otherwise undifferentiated diabetes. Reverse causality, or the idea that pancreatic ductal adenocarcinoma causes hyperglycemia appears to be the source of the much higher risk of pancreatic ductal adenocarcinoma in those with newly diagnosed diabetes. The occurrence of diabetes in the context of pancreatic ductal adenocarcinoma has vital clinical implications. Diabetes is linked with negative clinical outcomes for those having pancreatic ductal adenocarcinoma. They are also at an increased risk for post-surgery complications including surgical site infections, pancreatic leaks, intra-abdominal abscesses, and delayed gastric emptying.



Management



Managing type 3c can be difficult as the current guidelines suggest treatment of type 3c with metformin or insulin. There isn't a one-size-fits-all treatment because it really comes down to how much the pancreas are damaged.

More knowledge on the pathogenesis is required to accurately define and distinguish type 3c diabetes from other diabetes subtypes. Understanding the underlying mechanisms of disease, including genetic predispositions and physiological differences in β -cell function and insulin sensitivity, will help to differentiate between type 2 and type 3c diabetes.

Key takeaway points

- Type 3c diabetes develops because of the removal or damage to the pancreas due to various reasons like pancreatitis, pancreatic cancer, or cystic fibrosis.
- It is diagnosed if you have a history of an exocrine pancreatic disease.
- The current guidelines suggest treating type 3c diabetes with metformin or insulin.
- More research is required to accurately define and distinguish type 3c diabetes from other diabetes subtypes.

Resources:

1. Hart PA, Bellin MD, Andersen DK, *et al.* Type 3c (pancreatogenic) diabetes mellitus secondary to chronic pancreatitis and pancreatic cancer. *Lancet Gastroenterol Hepatol.* 2016;1(3):226-237. doi:10.1016/S2468-1253(16)30106-6
2. Lucye. What is type 3C diabetes? Diabetes UK. Accessed November 18, 2023. <https://www.diabetes.org.uk/diabetes-the-basics/type-3c-diabetes>



Managing Diabetes and Cancer: Practical Daily Tips



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People living with diabetes and cancer need to prioritize blood glucose control for overall health and to prevent potential therapy delays due to elevated blood glucose levels. A strong immune system is essential during cancer treatment to prevent infection risks. A few practical tips to help in managing diabetes during cancer treatment.

Self-learning and planning

Manage diabetes actively for better outcomes during cancer treatment. Learn about the illness and discuss your management goals with the medical team to minimize adverse effects.

DIABETES SELF-MANAGEMENT

Regulate blood glucose and blood pressure



Cancer therapy can raise blood glucose, leading to infections and fatigue. Vascular damage from hypertension and diabetes weakens the immune system. A healthy diet and exercise help mitigate these effects.

Eat wisely

Manage blood glucose with mindful eating. Be aware of challenges like difficulty swallowing and nausea in cancer. Prioritize a balanced diet with fruits, whole grains, and legumes, while cutting back on processed foods and sweets.



Stay active

Exercise improves glucose uptake, builds muscle, and boosts mood by releasing endorphins. Create a home workout plan with a physical fitness therapist for optimal results.



Avoid unhealthy practices



Smoking weakens the immune system, raising vulnerability to infections. Limit alcohol to avoid dehydration and immune system impairment, especially with diabetes and cancer.

Manage stress

Coping with cancer and diabetes can be stressful, hindering insulin and causing hyperglycemia. Yoga and breathing techniques helps to reduce stress.



Talk about your feelings with others

Share your concerns with loved ones or a support group with those facing similar challenges. Speaking up can alleviate isolation and improve your overall well-being.



Key takeaway points

- Managing diabetes during cancer treatment is vital.
- Prioritize blood glucose control, regulate blood pressure through a balanced diet, and practice mindful eating.
- Stay active with tailored exercise plans and avoid unhealthy habits.
- Communicate openly about concerns with loved ones or support groups for overall well-being.

Resource:

- Tips for managing your diabetes during cancer treatment. City of Hope. March 28, 2023. Accessed November 21, 2023. Available at <https://www.cancercenter.com/community/blog/2020/05/tips-diabetes-cancer>

Interview with Dr. Tushar Bandgar



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Diabetes and Cancer



1. Research suggests a potential bidirectional relationship between diabetes and cancer. Can you elaborate on how having diabetes may influence the risk of developing cancer and vice versa?

Ans. Cancer is predicted to become the leading cause of diabetes-related death in the coming years overtaking cardiovascular



disease. Cancer and type 2 diabetes mellitus (T2DM) are known to share many common risk factors, including genetics, ageing, obesity, unhealthy diet, physical inactivity, alcohol, and smoking. diabetes along with obesity induces metabolic abnormalities leading to the release of various inflammatory cytokines, immune mediators, hormones, and growth factors. These abnormal metabolic substrates are implicated as risk factors for development of cancer and its mortality. Pancreatic cancer is one of the causes of pancreatic DM (Type 3cDM) and it occurs in 30 % of these patients. Corticosteroids are commonly used in cancer patients as a part of treatment regimen of hematological and solid tumors such as prostate cancers, as

adjunctive agents for nausea and vomiting, supportive measures to improve appetite, and to reduce edema in patients with metastasis to the brain and spinal. Corticosteroids are known to induce hyperglycemia due to reduced insulin sensitivity with increased glucose production and inhibition of the production and secretion of insulin by pancreatic β -cells. Immunotherapies (PD/PD-L and CTLA-4 inhibitors) can reduce the production of insulin from islet cells leading to type 1 diabetes mellitus, whereas targeted treatments such as PI3K/mTOR inhibitors can induce insulin resistance similar to that seen in T2DM. Many other anticancer drugs like asparaginase, diazoxide, tamoxifene, bicalutamide, etc., can cause diabetes.

2. Are there specific types of cancer that are more commonly associated with diabetes?

Ans. A series of recent studies and meta-analyses on DM confirm that the risk for several solid and hematologic malignancies (including liver, pancreas, colorectal, kidney, bladder, endometrial and breast cancers, and non-Hodgkin's lymphoma) is elevated in diabetic patients. Endocrine tumors like acromegaly, Cushing syndrome, glucagonoma and adrenal tumors can cause diabetes. Hyperglycemia generally resolves following successful removal of the tumor.

3. How does the presence of diabetes impact the prognosis and treatment outcomes for cancer patients?



Ans. Cancer patients with diabetes have a higher rate of comorbid illnesses with high risk of both acute and chronic toxicities from cancer treatment. Somatostatin analogues like octreotide, lanreotide and pasireotide which are commonly used as medical modality of managing neuroendocrine tumors including secretory insulinomas, VIPomas, glucagonomas, and other non-functional neuroendocrine tumors can lead to hyperglycemia. Steroid therapy prescribed in cancer regimens can be continuous or in cycles. Diabetic medications have to be titrated accordingly. Chemotherapy and endocrine therapy especially increase the risk of cardiovascular disease including heart disease, hypertension, kidney disease, and stroke, as well as osteoporosis.

4. In your opinion, how important is it for healthcare professionals to collaborate across specialties, such as diabetology and oncology, when treating patients with both diabetes and cancer?

Ans. Diabetes management in cancer patients requires a comprehensive and collaborative approach. Collaboration and interaction between oncologists and diabetologists are critical to achieve appropriate levels of care and reduce the risk of complications. Collaboration can also help to improve patient outcomes, prevent errors, and reduce costs. Patients with DM and cancer often have complex medical and psychosocial needs, and effective communication and support can help them to cope with treatment-related complications. Following successful removal of the endocrine tumors by endocrine surgeons, oral antidiabetic drugs and insulin may be reduced or discontinued.



5. Can you share insights into preventive strategies for individuals with diabetes to reduce their risk of developing cancer? Are there lifestyle modifications or specific interventions that can be beneficial in this context?

Ans. People with diabetes are at greater risk of developing cancer and a lower chance of surviving it, although such risks vary by cancer types. Surveillance and screening for cancers related to diabetes and early intervention are key for management. Family members screening of genetic endocrine tumours is must for early detection and surveillance. Furthermore, continuing emphasis and behavioural intervention on life style factors and promotion of regular aerobic physical activity, weight management, a healthy diet, stress management, reducing alcohol consumption, smoking cessation, and self-management of diabetes are important to reduce future complications.



In T2DM Uncontrolled on DPP4i + Metformin, SGLT2i + Metformin, SGLT2i + DPP4i,

Uptitrate with

UDAPA-Trio

Dapagliflozin 10 mg + Sitagliptin 100 mg + Metformin 500 mg XR

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Dapagliflozin 10 mg + Sitagliptin 100 mg + Metformin 1000 mg XR



Cardio Benefits

A1C Control

Renal Benefits

Ensures Adherence

Abridged Prescribing Information

Indications: It is indicated as an adjunct to diet and exercise to improve glycaemic control in adults with type 2 Diabetes mellitus.

Dosage and Administration: The recommended dose is one tablet daily. Each tablet contains a fixed dose of Dapagliflozin, Sitagliptin and Metformin Hydrochloride.

Adverse Reactions: Most common adverse reactions reported are: Dapagliflozin- Female genital mycotic infections, nasopharyngitis, and urinary tract infections; Sitagliptin- Upper respiratory tract infection, sinusitis, headache; Metformin- Diarrhea, nausea/vomiting, flatulence, asthenia, indigestion, abdominal discomfort, and headache.

Warnings and Precautions: Dapagliflozin: Volume depletion; Ketacidosis in Patients with Diabetes Mellitus; Urinary and Pyelonephritis; Hypoglycemia; Genital Mycotic infections.

Sitagliptin: General- Sitagliptin should not be used in patients with type 1 diabetes or for the treatment of diabetic ketoacidosis. Acute pancreatitis; Hypoglycemia when used in combination with other anti-hyperglycemic medicinal product; Renal impairment; Hypersensitivity reactions including anaphylaxis, angioedema, and exfoliative skin conditions; Stevens-Johnson syndrome, Erythema multiforme; Metformin Hydrochloride: Lactic acidosis; In case of dehydration (severe diarrhea or vomiting, fever or reduced fluid intake), metformin should be temporarily discontinued and contact with a healthcare professional is recommended.

Contraindications: Hypersensitivity to the active substance of Dapagliflozin, Sitagliptin & Metformin or to any of the ingredients listed. Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis), Diabetic pre-coma; Severe renal failure (eGFR < 30 mL/min); Acute conditions with the potential to alter renal function such as: Dehydration, Severe infection, Shock; Acute or chronic disease which may cause tissue hypoxia such as: Cardiac or respiratory failure, Recent myocardial infarction, Shock, Renal impairment, Acute Alcohol intoxication, alcoholism.

Use in a special population: Pregnant Women: Due to lack of human data, drug should not be used during pregnancy. Lactating Women: It should not be used during breastfeeding. Pediatric Patients: The safety and efficacy of drug has not yet been established. No data are available. Geriatric Patients: In Patients > 65 years, it should be used with caution as age decreases.

Additional information is available on request.

Last updated: January 01, 2023



Identifying the Insulin Misuse



Dr K Krishnamoorthy

MD, DNB

Consultant Physician and Diabetologist
Shenbagam Diabetes Clinic, Madurai

A lady diagnosed with type 2 diabetes mellitus was managed by Dr. K. Krishnamoorthy.

Here's what Dr. K. Krishnamoorthy has to say:

I recently encountered a challenging case involving a 55-year-old patient who had recently lost her 28-year-old son. This emotional distress led to evident stress and depression, exacerbating the patient's health. Subsequently, she developed psychological issues and insomnia. Upon investigation, the patient was diagnosed with type 2 diabetes, unveiling alarming fasting sugar levels exceeding 300 mg/dL and postprandial levels surpassing 450 mg/dL. The initial treatment plan involved oral medications, metformin, and glimepiride, addressing diabetes, alongside a combination of chlorthalidone and amitriptyline to manage depression and insomnia. However, the patient's non-compliance with the prescribed regimen, coupled with the development of hyperosmolar non-ketotic syndrome (HONK), necessitated a more thorough examination.

A detailed assessment, including a full-body checkup and continuous glucose monitoring system (CGM), revealed elevated blood glucose levels in the patient. A prescription of premix analogs and antidepressants was initiated, but this led to frequent hypoglycemia events. Despite dosage adjustments from 20 units in morning and night to 15 and 10 respectively, the hypoglycemia persisted, leading to repeated hospital admissions. This is where I took help from MDE Syed Kader. He conducted counseling sessions with the caretaker, focusing on education about injection techniques and emphasizing the need for vigilant monitoring.

Through this intervention, we discovered that the patient was unknowingly exceeding the prescribed insulin limit. Consuming an entire cartridge in just three days, this revelation prompted further counseling with the caretaker, who was then entrusted with monitoring and supervising medication administration. Due to timely education and identifying the underlying issue patient's blood sugar levels are now under control, marking a significant triumph in her healthcare journey.



Mr. Syed Kader

NDEP and T1DE Certified Diabetes Educator

Here's what Syed had to say:

After working closely with the caretaker and patient, I spotted possible insulin misuse. By checking cartridge purchases and advising vigilant monitoring, we found the insulin was doubled. I educated the patient and caretaker on proper insulin techniques and introduced a 1400-calorie diet plan. These steps greatly improved glycemic control and overall well-being.

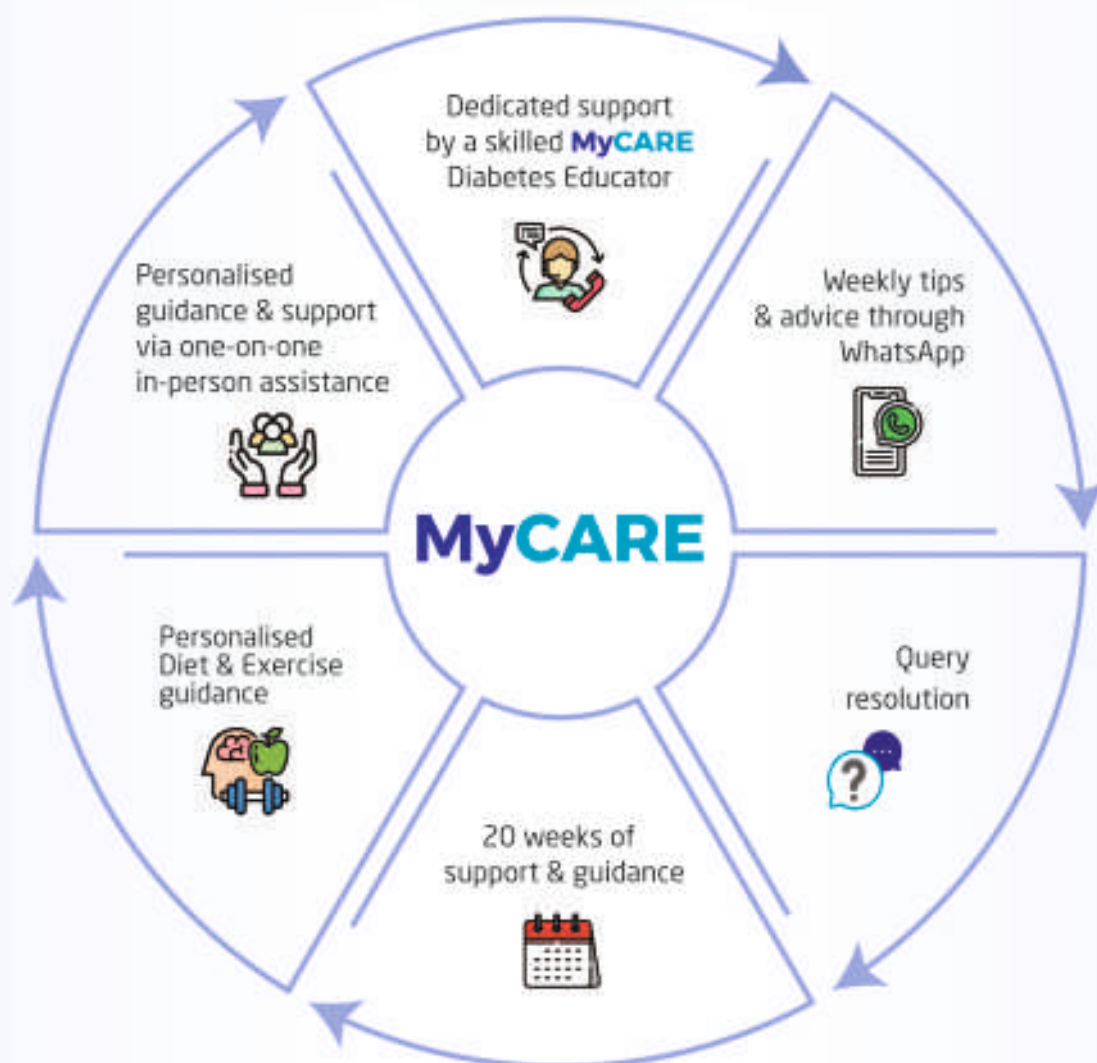




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Meta analysis of
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Appropriate to add along with Newer AHAs

1. Glimepiride use is associated with reduced cardiovascular mortality in patients with type 2 diabetes and chronic heart failure, a prospective cohort study | *European Journal of Preventive Cardiology* | Oxford Academic (oup.com) 2. *Ther Adv Endocrinol Metab* 2020, Vol 11:1-12 DOI: 10.1177/2042018820928500. # Data on file * As compared to non-glimepiride group
EET: Eicosylcostrinemic acid; sEH: soluble Eoxide Hydrolase; AHAs: antihyperglycemic agents; T2DM: Type 2 Diabetes Mellitus

Prescribing Information

Indications: Metformin hydrochloride (as prolonged release) and glimepiride tablets. Glycimer-GP 0.5/Glycimer-GP 0.5 Forte, Glycimer-GP 1/Glycimer-GP 1000, Glycimer-GP 2/Glycimer-GP 2000, Glycimer-GP 3/Glycimer-GP 3000, Glycimer-GP 4/Glycimer-GP 4000, Glycimer-GP 1 Forte, Glycimer-GP 2 Forte, Glycimer-GP 3 Forte, Glycimer-GP 4 Forte. **Extended Prescribing Information:** **Composition:** Glycimer-GP 0.5mg: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500mg and glimepiride IP 0.5mg. • Glycimer-GP 0.5 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg. • Glycimer-GP 1: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 1 mg. • Glycimer-GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. • Glycimer-GP 3: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 3 mg. • Glycimer-GP 4: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 4 mg. • Glycimer-GP 1000: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. • Glycimer-GP 2000: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. • Glycimer-GP 3000: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. • Glycimer-GP 4000: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 4mg. • Glycimer-GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. • Glycimer-GP 2 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. • Glycimer-GP 3 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. • Glycimer-GP 4 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 4mg. **Indications:** For the management of patients with type 2 diabetes mellitus when diet, exercise, and single agent (glimepiride or metformin alone) do not result in adequate glycaemic control. **Dosage and Administration:** The recommended dose is one tablet daily during breakfast at the first main meal. Each tablet contains a fixed dose of glimepiride and Metformin Hydrochloride. The highest recommended dose per day should be 8 mg of glimepiride and 2500mg of metformin. Due to prolonged release formulation, the tablet must be swallowed whole and not crushed or chewed. **Adverse Reactions:** For Glimepiride: hypoglycaemia may occur, which may sometimes be prolonged. Occasionally, gastrointestinal (GI) symptoms such as nausea, vomiting, sensations of pressure or fullness in the epigastrium, abdominal pain and diarrhea may occur. Hepatitis, elevation of liver enzymes, cholelithiasis and jaundice may occur; allergic reactions or allergic asthma may occur occasionally. For Metformin: GI symptoms such as nausea, vomiting, diarrhea, abdominal pain, and loss of appetite are common during initiation of therapy and may resolve spontaneously in most cases. Metallic taste, mild asthenia, increase in VLDL absorption, very rarely lactic acidosis, hemoxytic anemia, reduction of erythrocyte level in patients with hypothyroidism, hypomagnesaemia in the context of diarrhea, Encephalopathy, Photosensitivity, hypersensitivity disorders. **Warnings and Precautions:** For Glimepiride: Patient should be advised to report promptly exceptional stress situations (e.g., illness, surgery, febrile infections); blood glucose regulation may deteriorate, and a temporary change to insulin may be necessary to maintain good metabolic control. Metformin Hydrochloride may lead to lactic acidosis; in such cases metformin should be temporarily discontinued and contact with a healthcare professional is recommended. Sulfonamides have an increased risk of hypoglycaemia. Long-term treatment with metformin may lead to peripheral neuropathy because of decrease in vitamin B12 serum levels. Monitoring of the vitamin B12 level is recommended. Overweight patients should continue low energy-restricted diet. Usual laboratory tests for diabetes monitoring should be performed regularly. **Contraindications:** Hypersensitivity to the active substance of glimepiride & Metformin or to any of the excipients listed. Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis, diabetic pre-coma). Severe renal failure (GFR<30ml/min). In pregnant women. In lactating women. Acute conditions with the potential to alter renal function (dehydratation, severe infection, shock, intravenous administration of iodinated contrast agents), acute or chronic disease which may cause tissue hypoxia (pulmonary or respiratory failure, recent myocardial infarction, shock), hepatic insufficiency, acute alcohol intoxication, alcoholism. **Use in a special population:** Pregnant Women: Due to a lack of human data, drugs should not be used during pregnancy. Lactating Women: It should not be used during breastfeeding. Pediatric Patients: The safety and efficacy of drugs has not yet been established. Renal impairment: A GFR should be assessed before initiation of treatment with metformin containing products and at least annually thereafter; in patients at increased risk of further progression of renal impairment and in the elderly, renal function should be assessed more frequently, e.g., every 2-6 months.

Additional information is available on request.

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Nutrition Strategies for Individuals with Diabetes and Cancer



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Cancer and diabetes are both conditions which have a significant global health impact. Because they share many risk factors. Epidemiologic evidence suggests that people with diabetes are significantly more likely to develop many types of cancer, including endometrial, breast, bladder, pancreatic, liver, and colorectal cancers. Eating the right food is of prime importance for managing the blood glucose

levels as well as for healing, fighting infection, and having enough energy.

Given below are a few dietary tips to manage both diabetes and cancer.

- The diet should be rich in protein to help restore tissues damaged by cancer treatment and to improve strength.
- Incorporate naturally sweet fruits as these could aid in stimulating the appetite. Avoid foods with refined or added sugars.
- Foods such as vinegar and lemon juice, might increase hunger by promoting salivation. Additionally, the taste of food can be improved by adding herbs and spices, and the distinct flavors of these seasonings may also assist in lowering the sodium content of meals.
- Drink a lot of water. When one cannot eat, it is even more crucial to stay hydrated. The recommended daily fluid intake for most adults is 8 to 12 cups. Keeping a water bottle close by could make this task simpler.
- When the appetite wanes, it might be challenging to consume a large meal. Consuming nutrient and calorie-dense foods in moderation can provide the necessary calories, protein, and nutrients to manage diabetes and cancer. For instance, by incorporating nuts or seeds into a salad or adding avocado, eggs, beans, peas, curd, buttermilk, yoghurt, paneer, etc. in the meal.
- Eating favorite foods in moderation helps in motivating people during cancer treatment. Sticking to smaller portions helps with loss of appetite and prevents blood glucose spikes.
- It is advised to raise the proportion of energy from good fats v/s energy from carbohydrates in cancer patients who are losing weight but have insulin resistance. This is meant to lower the glycemic load and raise the caloric density of the diet.



Key takeaway points

- For people with diabetes and cancer it is important to have a diet which is nutritionally balanced, high in protein and calories as it helps to restore tissues damaged by cancer treatment and to improve strength.
- Smaller portions at a time are advised.
- Avoid foods with refined or added sugars.
- It is advisable to include nutrient dense foods like nuts and seeds in the diet.
- It is also advised to raise the proportion of energy from good fats to energy from carbohydrates in cancer patients who are losing weight but have insulin resistance.

Resources:

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Pancreatic Cancer and Diabetes - Is there a Link?



Dr. Bidisha Das

MBBS, MD

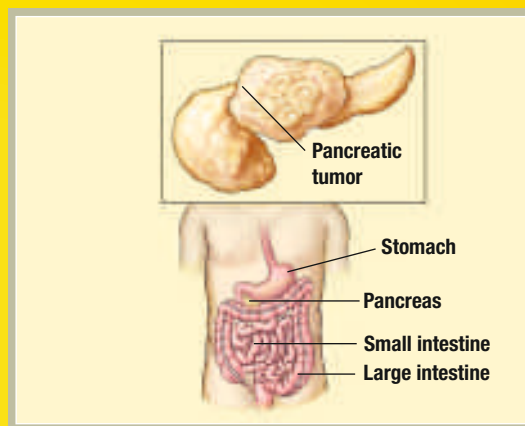
Consultant Diabetologist, AB Diabetes and Thyroid clinic, Surat

Pancreatic cancer (PC) is known for its high prevalence of advanced-stage disease upon diagnosis and its resistance to treatment, making it a highly aggressive malignancy with poor prognosis. The predominant type of PC is pancreatic ductal adenocarcinoma (PDAC), which includes more than 90% of pancreatic tumors and is the seventh-leading cause of death worldwide. According to the

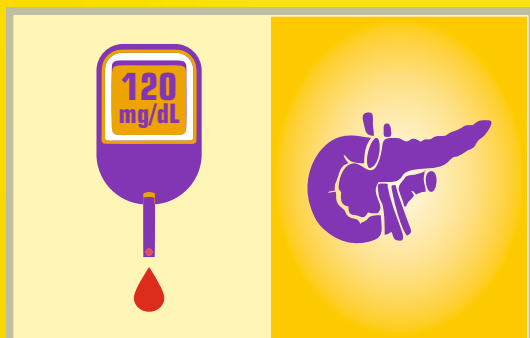
World Health Organization Globocan Database, the estimated number of new cases worldwide is expected to increase by 70% between 2020 and 2040. Some of the primary risk factors linked with PC include a family history of the disease, genetic mutations, a sedentary lifestyle, obesity, smoking, diabetes mellitus (DM), and chronic pancreatitis.

DM – A risk factor for PC

DM is a risk factor for PC because it increases insulin resistance, intra pancreatic concentrations of insulin, and the bioavailability of IGF (insulin growth factor), hence stimulating the proliferation of ductal cells. As a result, several researchers are concentrating on treatments that target the insulin/IGF pathway.



PC and DM



The association between PC and DM is complex. DM is both a risk factor and an early indicator of pancreatic cancer. Several studies have addressed this issue. Several recent studies that have explored the complex and bidirectional relationship between PC and type 2 DM (T2DM) highlights the significance of considering PC in individuals with recent or uncontrolled diabetes, especially in the elderly.

Long-standing T2DM: A risk factor for PC

Long-standing T2DM represents a significant risk factor for several malignancies, including PC. Numerous studies have shown that approximately 85% of patients diagnosed with PC had concurrent diabetes at the time of diagnosis. Compared to patients without diabetes, those with T2DM who have had the disease for more than five years had a 50% higher risk of developing PC. In a study of 29,133 Finnish male, Stolzenberg-Solomon *et al.* (2005) showed a positive correlation between PDAC and increased fasting glucose, insulin levels, and insulin resistance. The mechanism of the relationship between diabetes and PC is based on the theory that high insulin levels, especially in the pancreas itself, as a result of obesity, prediabetes, or T2DM, may have proliferating effects on surrounding acinar and ductal cells. This observed correlation may be explained by sustained hyperinsulinemia and the ongoing push from beta cells to overcome insulin resistance and maintain glucose homeostasis.

New-onset Diabetes (NOD) can also be the first manifestation of PC. The field of early PDAC detection is significantly impacted by the identification of NOD as a clinical manifestation of occult PDAC. Being able to differentiate between NOD of type 2 and NOD caused by PDAC offers the chance to detect and diagnose PDAC at an early stage, when treatment may be curative.

Out of the several theories for the pathogenesis of DM in PC the most important one is that DM is a paraneoplastic syndrome caused by diabetogenic factors. As a result of this complex relationship, NOD after the age of 50 is regarded as a warning sign for PC, indicating the need for screening in this group of population. Numerous clinical studies are presently in progress investigating this matter.

A better understanding of the relationship between DM and PC could aid in developing innovative screening and treatment strategies for pancreatic cancer. In the long run, this might enhance the prognosis and quality of living of patients with PC.

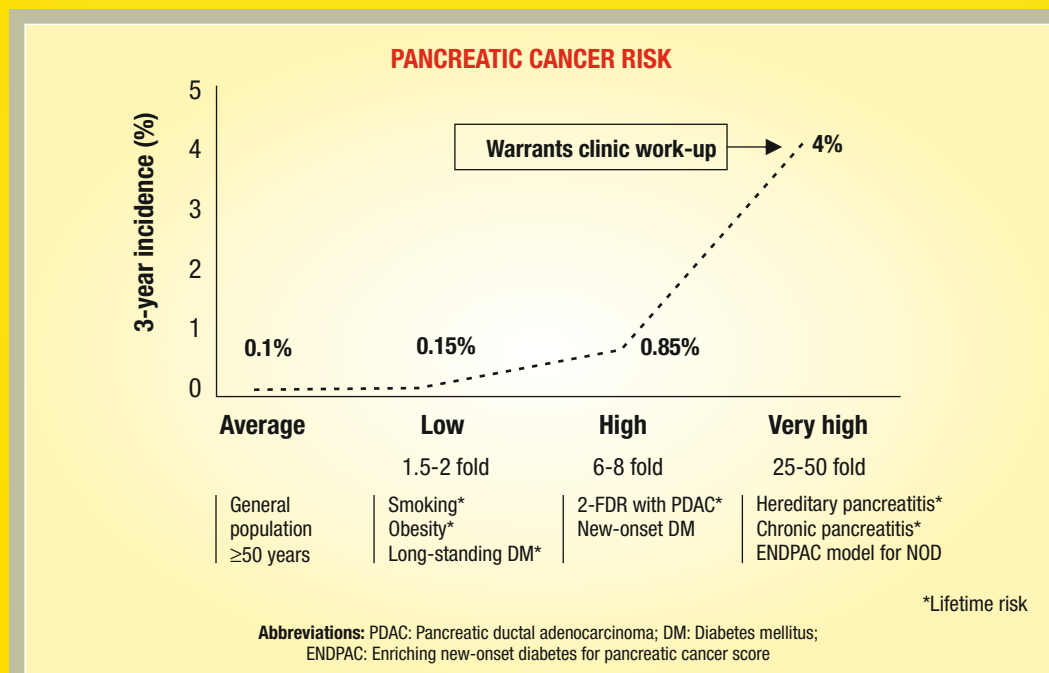


Figure 1. Schematic diagram showing incidence risk of pancreatic cancer in currently known risk groups. Compared to long-standing diabetes, new-onset diabetes has a significantly higher risk. This risk further elevated with the clinical risk prediction model such as Enriching New-onset Diabetes (NOD) for Pancreatic Cancer (ENDPAC) score. Source: Sharma A, Chari ST, 2018.

Key takeaway points

- PC is often diagnosed at an advanced stage and has a poor prognosis. According to epidemiological studies, T2DM and PC have a complex and intricate association.
- The risk of PC is highest in the early stages following a diabetes diagnosis, after which it declines but remains high for many years. According to time-related elements of the relationship between diabetes and PC, new-onset diabetes is an early sign of the tumor, whereas long-standing diabetes increases the risk of PC by 1.5 to 2 times.
- There could be a direct correlation between long-term diabetes and PC through processes such as compensatory hyperinsulinemia and resistance, low chronic inflammation, higher levels of circulating insulin-like growth factors, and hyperglycemia.
- The correlation between long-term diabetes and PC could stem from common risk factors, specifically obesity and overweight.
- PC-related diabetes could be a clinical indicator of underlying, asymptomatic malignancy. Finding the clinical characteristics and biomarkers that differentiate T2DM from cancer may help discover PC earlier, improve survival, and improve care.

Resources:

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Non-alcoholic Fatty Liver Disease and Diabetes: The Deadly Duo for Liver Cancer



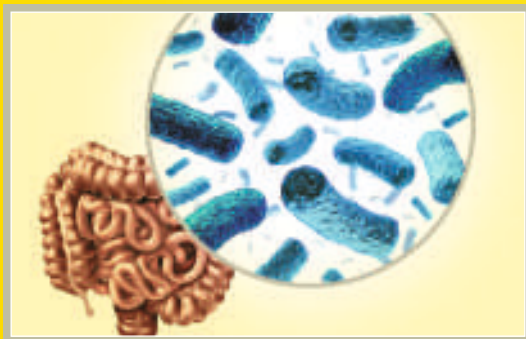
Dr. Mohit Mohan Singh

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Non-alcoholic fatty liver disease (NAFLD) and type 2 diabetes mellitus (T2DM) are emerging as a deadly duo, intricately linked and posing a significant risk for the development of liver cancer. Understanding the complex pathophysiological connections between these two conditions provides valuable insights into the mechanisms that underlie the development of liver cancer.

Elevated hepatic insulin resistance, oxidative stress, chronic inflammation, and lipotoxicity serve as strong indicators linking T2DM and NAFLD. This creates a hostile liver environment characterized by increased pro-inflammatory cytokines and growth factors, promoting cellular growth and inhibiting apoptosis, ultimately increasing the risk of liver cancer.

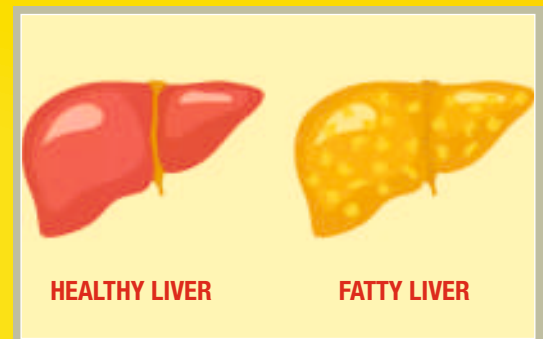
The mechanistic process involves a complex interplay of factors such as fatty liver, obesity, and insulin resistance. Increased absorption of free fatty acids and de-novo lipogenesis in hepatocytes leads to intracellular triglyceride accumulation. Simultaneously, reduced hepatic secretion of very low-density lipoproteins and mitochondrial oxidative stress result in cellular necrosis and inflammation. Excessive production of adipokines, including leptin and tumor necrosis factor (TNF), exacerbates mitochondrial oxidative stress, while disrupted regulation of adiponectin encourages the action of inflammatory adipokines. These mediators stimulate liver stellate cells, promoting fibrosis as a precursor to liver cancer.



Recent research highlights the role of gut microbiota in T2DM, NAFLD, and obesity pathogenesis. Changes in gut microbiota composition disrupt energy metabolism, contributing to these conditions. Metabolites, including bile acids, generated by gut microbiota influence liver health, and their disruption has been associated with hepatic carcinogenesis, underscoring the microbiota's significance in the deadly duo of NAFLD and T2DM.

The connection between NAFLD and T2DM poses a significant challenge for liver cancer. Crucial pathophysiological links, including insulin resistance, oxidative stress, inflammation, and genetic factors, must be understood for targeted interventions. The shift to metabolic dysfunction-associated fatty

liver disease (MAFLD) emphasizes metabolic risk factors over alcohol, shaping diagnostics and therapeutics. This evolving understanding of metabolic factors and liver health will profoundly influence the future directions of the field.



Key takeaway points

- NAFLD and T2DM form a perilous duo, intricately linked and elevating the risk of liver cancer.
- Indicators like insulin resistance and inflammation create a hostile liver environment, promoting liver cancer development.
- Mechanistically, the progression from T2DM to NAFLD involves synergistic contributions of fatty liver, obesity, and insulin resistance.
- Excessive adipokines and disrupted adiponectin regulation stimulate fibrosis, while gut microbiota disruptions and altered metabolites underscore their role in hepatic carcinogenesis.
- Navigating these challenges and understanding evolving concepts, such as the shift to MAFLD, are pivotal for targeted interventions and shaping the future of liver health.

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Diabetes Medications and Their Impact on Cancer Risk



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Managing type 2 diabetes requires a gradual treatment strategy, commencing with single-drug therapy and progressing to combinations of two to three oral medications. As the disease advances, injectable treatments such as GLP-1 receptor agonists and insulin may be introduced, either alone or with oral medications. Evaluating the influence of antidiabetic medications on cancer risk poses

challenges due to the prolonged development timeframe of cancer and the continual evolution of therapeutic approaches. Here are some diabetes medications and their effects on cancer risk.

Metformin

Metformin, recognized for its cancer-protective effects, is associated with a 10-40% reduction in cancer incidence and mortality across various cancers, including gastric, colorectal, liver, breast, and endometrial cancers. Metformin's indirect anti-tumor effects include reducing insulin release by lowering hepatic glucose production and enhancing peripheral glucose uptake, reducing the risk of neoplastic and pre-neoplastic cell proliferation. Additionally, metformin shows additive or synergistic effects when combined with other chemotherapeutic drugs, enhancing its anticancer actions.



Insulin

Studies consistently link exogenous insulin use to an increased risk of colorectal cancer, with higher incidence and mortality rates observed in insulin users. A meta-analysis indicates a substantial 52% rise in cancer risk associated with insulin treatment. Insulin monotherapy exhibits a dose-dependent elevation in cancer risk, which is mitigated when combined with metformin. Real-world insulin therapy often involves higher doses and is initiated in patients with longer-lasting diabetes and worse metabolic control, influencing cancer risk. Caution against insulin overdosing and inducing hyperinsulinemia is crucial due to its mitogenic effect, aiming to mitigate associated cancer risks.



Thiazolidinedione



Thiazolidinedione, a longstanding antidiabetic drug acting on the PPAR- γ nuclear receptor, enhances insulin sensitivity and reduces pro-inflammatory cytokines. Surprisingly, they show a significant reduction in overall cancer risk by arresting cell growth, inducing apoptosis, and inhibiting invasion. However, pioglitazone, a specific thiazolidinedione, is linked to a higher risk of bladder cancer. Lower doses of pioglitazone appear to balance adverse effects while maintaining positive impacts on blood glucose, insulin sensitivity, and cancer risk.

Dipeptidyl-peptidase-4 (DPP-4) inhibitors

Dipeptidyl-peptidase-4 (DPP-4) inhibitors, commonly used for type 2 diabetes, enhance glucose metabolism by preventing the degradation of incretin hormones like GLP-1 and GIP. However, subsequent meta-analyses of randomized clinical trials (RCTs) and observational studies did not support an elevated cancer risk with DPP-4 inhibitors.

Sodium-glucose transport protein 2 (SGLT2) inhibitors

SGLT-2 inhibitors, is crucial for kidney glucose reabsorption, initially raised concerns about bladder and breast cancer. However, subsequent studies found no overall increase in cancer risk. Canagliflozin showed a lower risk of gastrointestinal cancer compared to other SGLT-2 inhibitors. It also demonstrates onco-protective effects in liver, lung, and colon cancer models. While some observational studies hinted at concerns, comprehensive, longer-term human studies are needed. Current evidence does not consistently support a significant association between SGLT-2 inhibitor use and elevated cancer risk.

The dynamic interplay between diabetes, medications, and cancer risk necessitates ongoing research. Clinicians should carefully tailor treatment plans, considering glycemic control and potential cancer impacts. Long-term studies, especially for newer agents, are vital for a comprehensive understanding of diabetes medications and their relationship with cancer outcomes.



Summary

- Antidiabetic medications differ in their impact on cancer risk.
- Metformin and thiazolidinedione's are generally beneficial, except for bladder cancer with the latter.
- Incretin drugs, particularly GLP-1 receptor agonists, seem neutral with potential benefits.
- Insulin, due to its mitogenic effect, should be used cautiously.
- The long-term impact of SGLT-2 inhibitors on cancer risk is unclear, necessitating further observations to assess potential benefits and harm.

Resources:

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Frequently Asked Questions on Diabetes and Cancer



Dr. Sreejith M. G.

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Endocrinology (UK)

Consultant Physician and Diabetologist, SH
Medical Centre and Diabetic Clinic, Kottayam

1. My father is 67 years old and was diagnosed with oral cancer 2 years ago, and has long-standing diabetes since the past 15 years. He has been advised to undergo surgery for the same, however, we have been first asked to get his sugars under control. Is there any specific reason for this as we do not want to delay the surgery?

Ans. Yes, tight blood glucose control is of utmost importance prior to any surgery and cannot be ignored. It is advised for faster and better healing post the surgery and to avoid any further complications. Post-surgery, the wound needs a steady flow of blood and oxygen to help it recover. Hyperglycemia can cause the blood vessels to constrict and stiffen. Consequently, the supply of oxygen and nutrients to the wound is inadequate. This may cause the healing process to stall. The longer it takes for the wound to heal, the greater the chances of an infection. Additionally, high blood glucose levels can cause diabetic neuropathy. In this condition, the nerves are damaged causing the legs, feet, or other body parts to become devoid of sensation. This makes it more challenging to recognize infection symptoms because of this lack of feeling. Infections not only make healing more difficult, but they can also require antibiotics, more surgery, or longer hospital stays. Diet modifications, exercise routine, and following the doctor's prescription regimen will help to achieve the target levels quickly to proceed for the surgery.



2. I am 30-year-old male; I was diagnosed with diabetes 8 months ago. My blood glucose levels are borderline and keep fluctuating. Since then I have kept a close watch on my diet and exercise at least thrice a week, but my sugar levels keep fluctuating. A friend mentioned that my smoking is affecting my sugar levels. Is that true? Is there a connection between them?



Ans. Diabetes management is very tricky and there are several factors that impact blood glucose levels. Nicotine in cigarettes increases blood glucose levels and makes controlling them more challenging. Besides that, smoking is also associated with increasing the risk to diabetes related complications like heart diseases, stroke because it causes damage to the endothelial lining of the blood vessels. Smoking increases the oxidative damage and along with diabetes increases the risk to oral cancer as well. Since you have already started making positive lifestyle changes, quitting smoking will only help you further to live a long, complication free life.

3. My aunt is 52 years old and lives with us. She has been diagnosed with colon cancer and is currently undergoing chemotherapy for the same. The doctor has prescribed steroid medications as she has severe nausea due to chemotherapy. She did not have diabetes before, but now due to cancer treatment her blood sugars are coming very high. Does this mean she will now develop diabetes as well?

Ans. Cancer treatments like use of steroids, the stress related to battling cancer and weight gain caused by certain drugs, leads to something known as secondary diabetes. Usually, the blood glucose levels go back to normal once the steroids are stopped. However, the individual remains at high risk of developing type 2 diabetes in the future. You should ensure that your aunt is eating a healthy diet that is high in fiber and protein and low in refined carbohydrates. She should maintain a healthy weight and remain physically active. This will lower her risk of developing lifelong diabetes. It is also advisable to check the blood glucose levels every 6 months for the first year after completing therapy and annually thereafter.



Recipe: Broccowal Soup

Serves: 2

Ingredients	Amount
Broccoli (chopped)	1 cup
Onion (chopped)	¼ cup
Milk	½ cup
Walnuts (chopped)	¼ cup
Oil	2 tsp
Black pepper powder	To taste
Salt	To taste
Lime juice:	Few drops (optional)
1 cup: 250 mL; 1 tablespoon: 15 mL; 1 teaspoon: 5 mL	



Method

1. Heat oil in a non-stick pan, add chopped onions and sauté on a medium flame for one minute.
2. Add the chopped broccoli and sauté again for another two to three minutes.
3. Add 1 ¼ cup of water and cook for five more minutes or until the broccoli is cooked well, stirring occasionally.
4. Allow it to cool and blend in a mixer to make a smooth puree.
5. Transfer the puree into a deep pan, add milk, salt, and black pepper powder. Mix well and bring to a boil.
6. Serve hot, garnish with chopped walnuts, and add a few drops of lime juice.

Dia-Games

Word search

Look for the words given in the grid. They could be horizontal, vertical, or diagonal.

R	A	K	R	N	N	O	I	T	A	I	D	A	R
P	N	E	U	R	O	P	A	T	H	Y	A	D	I
M	M	A	N	H	C	D	N	C	C	D	N	A	S
E	I	N	T	S	C	S	E	N	N	A	D	A	T
T	S	G	R	E	A	A	T	I	I	I	I	N	O
F	M	N	S	N	N	E	I	E	P	A	G	F	D
O	O	A	D	N	C	E	I	O	R	R	C	M	I
R	K	F	U	M	E	A	K	O	D	O	S	I	I
M	I	L	E	O	R	I	R	R	O	E	I	A	E
I	N	D	O	M	N	T	N	R	K	F	I	D	T
N	G	E	O	E	T	T	E	E	F	E	L	E	O
P	A	O	S	C	N	D	O	S	S	A	S	N	N
S	R	P	A	N	C	R	E	A	T	I	T	I	S
I	R	D	I	S	N	E	C	R	O	S	I	S	R

SMOKING
ADIPOKINES
PANCREATITIS
NECROSIS
STEROID
NAFLD
METFORMIN
NEUROPATHY
CANCER
RADIATION

R	A	K	R	N	N	O	I	T	A	I	D	A	R
P	N	E	U	R	O	P	A	T	H	Y	A	D	I
M	M	A	N	H	C	D	N	C	C	D	N	A	S
E	I	N	T	S	C	S	E	N	N	A	D	A	T
T	S	G	R	E	A	A	T	I	I	I	I	N	O
F	M	N	S	N	N	E	I	E	P	A	G	F	D
O	O	A	D	N	C	E	I	O	R	R	C	M	I
R	K	F	U	M	E	A	K	O	D	O	S	I	I
M	I	L	E	O	R	I	R	R	O	E	I	A	E
I	N	D	O	M	N	T	N	R	K	F	I	D	T
N	G	E	O	E	T	T	E	E	F	E	L	E	O
P	A	O	S	C	N	D	O	S	S	A	S	N	N
S	R	P	A	N	C	R	E	A	T	I	T	I	S
I	R	D	I	S	N	E	C	R	O	S	I	S	R

NOTES

This image shows a single sheet of bright yellow paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

NOTES

Start Early with

Metformin Hydrochloride 500 mg SR + Glimepiride 0.5 mg

Metformin Hydrochloride 1000 mg SR + Glimepiride 0.5 mg



Resulted in



**BETTER
HALF**



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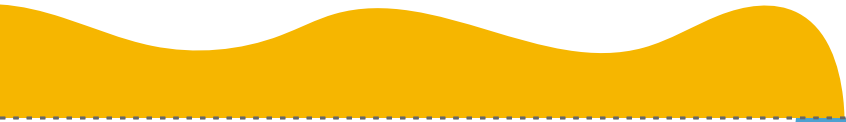
For Screening people with High & Moderate Risk of Diabetes

TO KNOW
YOUR RISK
OF DIABETES
SCAN HERE





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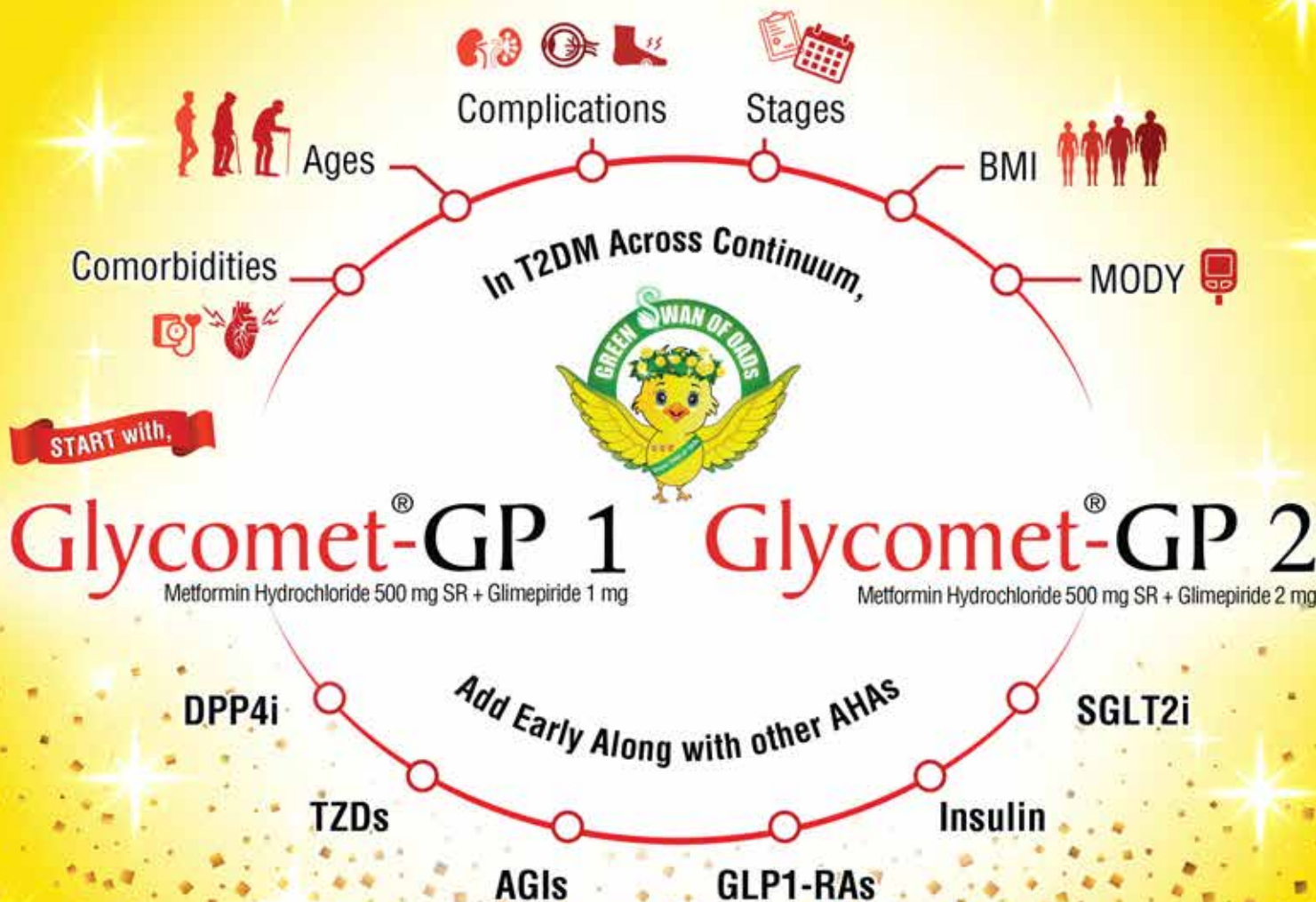


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* Data on File

1. Asian Journal of Diabetology, Vol. 23, No. 2, April-June 2022; YALAMANCHI SADASIVA RAO et al. 2. Asian Journal of Diabetology, Vol. 23, No. 2, April-June 2022; SAUMITRA RAY et al. 3. Cureus 2020; 12(9): e10.7759/cureus.1070
4. CMARC Data 5. Healthplix Data 6. Lim L-L, Lau ESH, Cheung JTK, et al. Real-world usage of sulphonylureas in Asian patients with type 2 diabetes using the Joint Asia Diabetes Evaluation (JADE) register. Diabetes Obes Metab. 2022;1-14. Doi:10.1111/dom.14865;

Prescribing Information

Information: Metformin hydrochloride (as prolonged release) and glimepiride tablets. Glycomet-GP 0.5/Glycomet-GP 0.5 Forte/ Glycomet-GP 1/ Glycomet-GP 1/850/ Glycomet-GP 2/ Glycomet-GP 2/850/ Glycomet-GP 3/ Glycomet-GP 3/850/ Glycomet-GP 4/ Glycomet-GP 4/850/ Glycomet-GP 1 Forte/ Glycomet-GP 2 Forte/ Glycomet-GP 3 Forte/ Glycomet-GP 4 Forte Abridged Prescribing Information **Composition:** Glycomet GP 0.5mg: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500mg and glimepiride IP 0.5mg. • Glycomet GP 0.5 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg. • Glycomet GP 1: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 1 mg. • Glycomet GP 1/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 1 mg. • Glycomet GP 2: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 2 mg. • Glycomet GP 2/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 2 mg. • Glycomet GP 3: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 3 mg. • Glycomet GP 3/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 3 mg. • Glycomet GP 4: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 500 mg and glimepiride IP 4 mg. • Glycomet GP 4/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 850 mg and glimepiride IP 4 mg. • Glycomet GP 1 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. • Glycomet GP 2 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. • Glycomet GP 3 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 3mg. • Glycomet GP 4 Forte: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 4mg. **Indication:** For the management of patients with type 2 diabetes mellitus when diet, exercise and single agent (glimepiride or metformin alone) do not result in adequate glycaemic control. **Dosage and Administration:** The recommended dose is one tablet daily during breakfast or the first main meal. Each tablet contains a fixed dose of glimepiride and Metformin Hydrochloride. The highest recommended dose per day should be 8 mg of glimepiride and 2000mg of metformin. Due to prolonged release formulation, the tablet must be swallowed whole and not crushed or chewed. **Adverse Reactions:** For Glimepiride: hypoglycaemia may occur, which may sometimes be prolonged. Occasionally, gastrointestinal (GI) symptoms such as nausea, vomiting, sensations of pressure or fullness in the epigastrium, abdominal pain and diarrhea may occur. Hepatitis, elevation of liver enzymes, cholestasis and jaundice may occur; allergic reactions or pseudo allergic reactions may occur occasionally. For Metformin: GI symptoms such as nausea, vomiting, diarrhea, abdominal pain, and loss of appetite are common during initiation of therapy and may resolve spontaneously in most cases. Metallic taste, mild erythema, decrease in Vit B12 absorption, very rarely lactic acidosis, Hemolytic anemia, Reduction of thyrotropin level in patients with hypothyroidism, Hypomagnesaemia in the context of diarrhea, Encephalopathy, Photosensitivity, hepatobiliary disorders. **Warnings and Precautions:** For Glimepiride: Patient should be advised to report promptly exceptional stress situations (e.g., trauma, surgery, febrile infections), blood glucose regulation may deteriorate, and a temporary change to insulin may be necessary to maintain good metabolic control. Metformin Hydrochloride may lead to Lactic acidosis; in such cases metformin should be temporarily discontinued and contact with a healthcare professional is recommended. Sulfonylureas have an increased risk of hypoglycaemia. Long-term treatment with metformin may lead to peripheral neuropathy because of decrease in vitamin B12 serum levels. Monitoring of the vitamin B12 level is recommended. Overweight patients should continue their energy-restricted diet, usual laboratory tests for diabetes monitoring should be performed regularly. **Contraindications:** Hypersensitivity to the active substance of glimepiride & Metformin or to any of the excipients listed. Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis, diabetic pre-coma). Severe renal failure (GFR<30ml/min). In pregnant women. In lactating women. Acute conditions with the potential to alter renal function (dehydration, severe infection, shock, intravascular administration of iodinated contrast agents); acute or chronic disease which may cause tissue hypoxia (cardiac or respiratory failure, recent myocardial infarction, shock); hepatic insufficiency; acute alcohol intoxication; alcoholism. **Use in a special population:** Pregnant Women: Due to a lack of human data, drugs should not be used during pregnancy. Lactating Women: It should not be used during breastfeeding. Pediatric Patients: The safety and efficacy of drugs has not yet been established. Renal impairment: A GFR should be assessed before initiation of treatment with metformin containing products and at least annually thereafter. In patients at increased risk of further progression of renal impairment and in the elderly, renal function should be assessed more frequently, e.g. every 3-6 months.

Additional information is available on request.

Last updated: March 13, 2023

*In case of any adverse events, kindly contact: pv@usv.in

For the use of registered medical practitioner, hospital or laboratory.*



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