

RSSDI
**Indian
Diabetes**
EDUCATOR JOURNAL



Theme of the Month

Diabetes and Footcare

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

2015

2016

2017

2018

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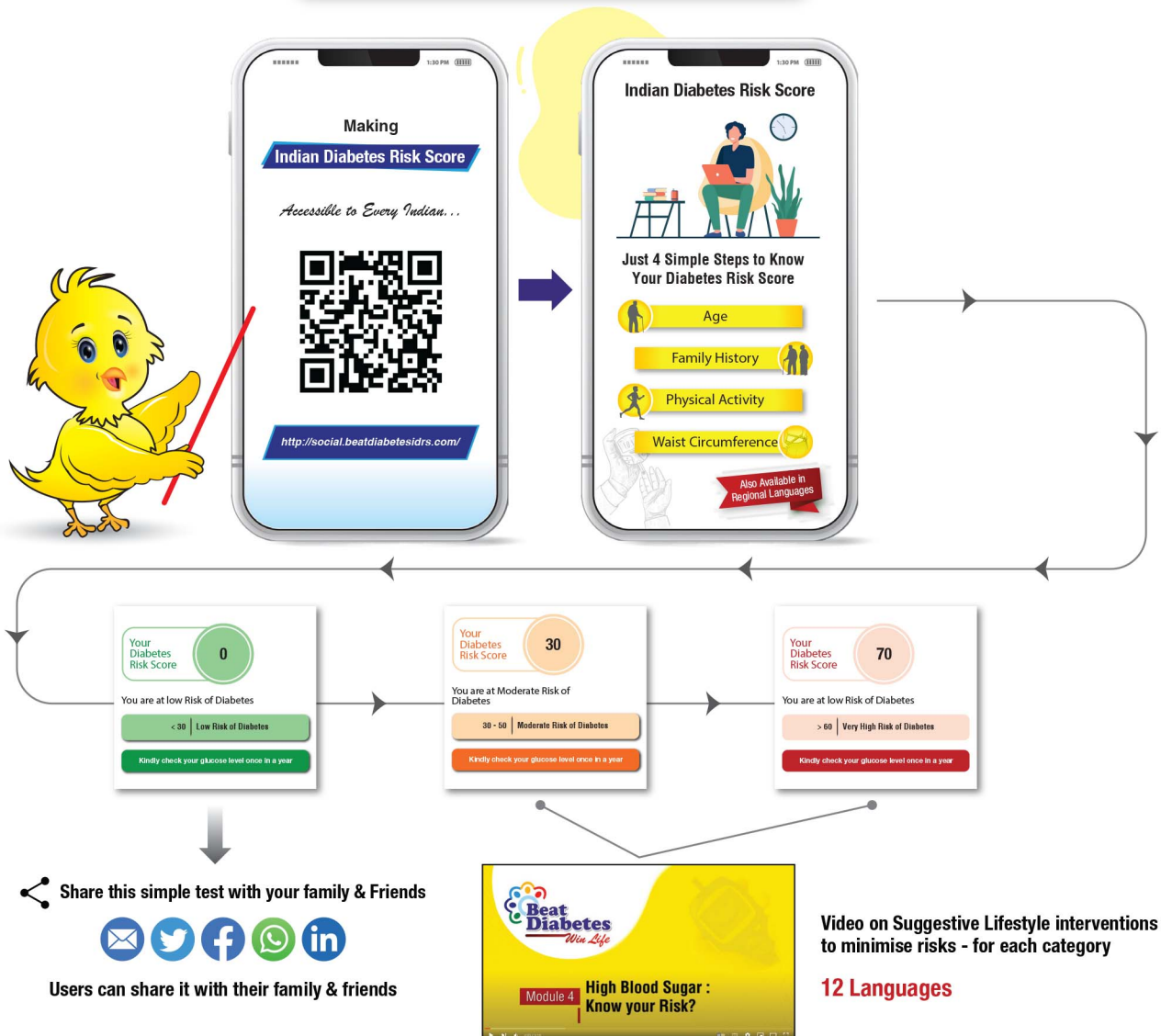


Beat Diabetes

Win Life

For screening people with High & Moderate Risk of Diabetes

Indian Diabetes Risk Score



An awareness initiative by





1st time in India*
To keep the members of
diabetes care team abreast with
DSME and DSMS 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.

The number of people with diabetic foot disease is increasing in both urban and rural India. Of all amputations, 85% are preceded by foot ulcers. This is potentially preventable. This month's IDEJ aims to propagate information on diabetic foot awareness, cause, care and diagnostic tools. We hope this journal will empower diabetes educators to spread awareness of the importance of foot care in diabetes.

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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RSSDI Indian Diabetes

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Cover Story: Diabetic Neuropathy and Peripheral Artery Disease



Dr. Sushil Jindal

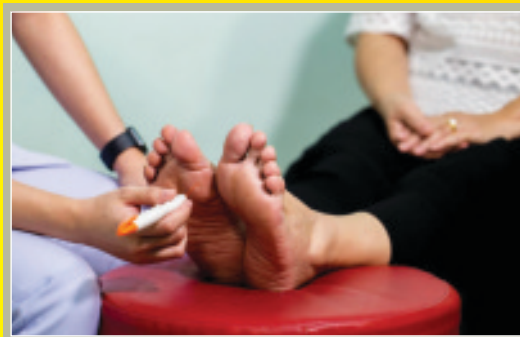
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Diabetes mellitus (DM) is a chronic metabolic disorder. Chronic hyperglycemia and poor glycemic control lead to many complications in the human body which cause severe mortality and morbidity. There are two basic categories of DM complications. Macrovascular complications are those that affect major vessels, like cerebrovascular disease,

peripheral artery disease, and coronary artery disease. The microvascular complications affect the small blood vessels in the kidney, peripheral nerves, and retina, causing nephropathy, neuropathy, and retinopathy, respectively. Among all the complications, foot complications in people with diabetes lead to substantial physical, physiological and financial burdens at large. Regardless of the type of diabetes, the risk of ulceration and amputation in people with diabetes (PWD) increases with age and duration of diabetes.

In India, diabetic foot care is one of the most neglected aspects of diabetes management. Due to societal, religious, and financial pressures, a lot of people go barefoot, avoid going to the doctor, or see general practitioners rather than diabetologists and podiatrists. Inappropriate footwear use and late examination of foot lesions are both caused by poverty and illiteracy. Prior to seeing their doctors, patients also explore home treatments. Both lower-extremity diseases, peripheral artery disease (PAD) and peripheral neuropathy are the leading cause of non-injury related amputations and disabilities in people with type 2 diabetes.



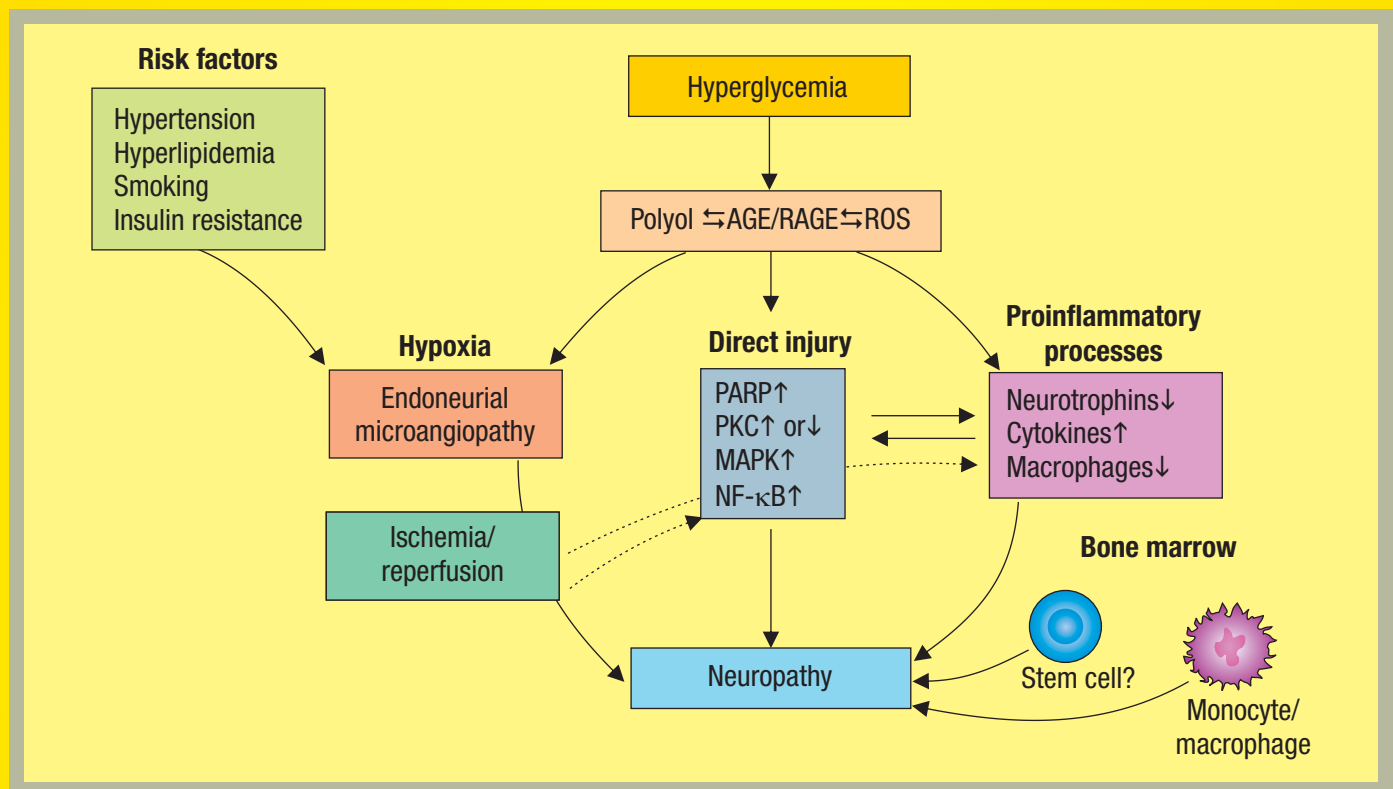
Neuropathy



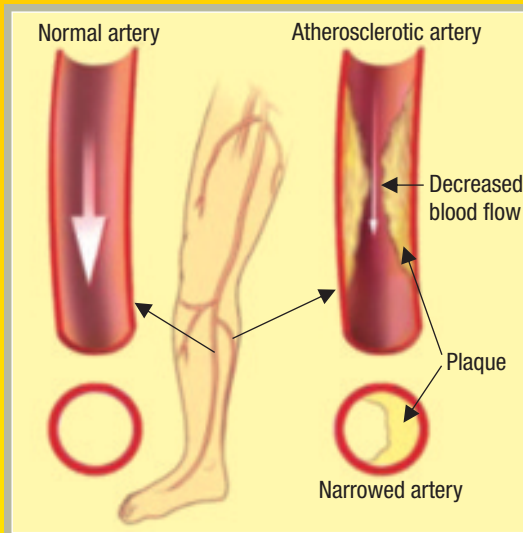
The most prevalent and untreatable consequence of diabetes is peripheral neuropathy. Somatic, sensory, motor, and autonomic nerves are all involved. Typically affecting the feet and legs, it can also occasionally affect the hands and arms. Peripheral neuropathy is a long-term condition caused by high blood glucose levels and lipid levels (triglyceride) in PWD, which can harm the nerves and the small blood vessels that nourish them. Burning, tingling, numbness, pain, and weakness in the foot, leg, arms, or hands are symptoms of peripheral neuropathy.

Pathophysiology of peripheral neuropathy

Long-term hyperglycemia results in downstream metabolic cascades of hyperactivity in the polyol pathway, increased advanced glycation end-products (AGE)/receptor for AGE (RAGE) responses and elevated reactive oxygen species. Through the activation of poly-ADP-ribose polymerase, alteration of protein kinase C, an increase in mitogen-activated protein kinase, and activation of nuclear factor-(NF)- κ B, they compromise endoneurial microvessels as well as neural tissues themselves, leading to functional and structural changes in peripheral neuropathy. The development of neuropathy is aided by the pro-inflammatory responses brought on by metabolic abnormalities in the nerve, which result in the production of cytokines, the inhibition of neurotrophins, and the migration of macrophages. Additionally, the nerve damage is elicited in the peripheral nerves of persons with diabetes by chimera cells, cellular factors generated from the bone marrow produce. Furthermore, ischemia/reperfusion may hasten nerve damage, which is partly mediated by inflammatory responses. Apart from hyperglycemia, insulin resistance, smoking, hyperlipidemia, and other risk factors such as hypertension also have a significant role in the development of neuropathy.



Peripheral artery disease

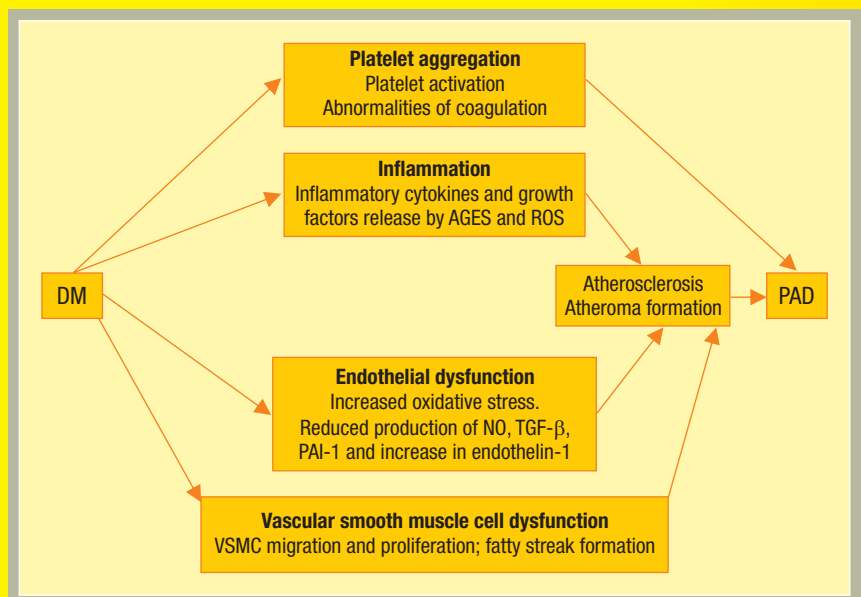


The term "peripheral arterial disease" (PAD) describes a partial or total occlusion of the peripheral vessels in the upper and lower extremities. The coronary and cerebral arteries typically experience it as a result of systemic atherosclerosis. Any blood artery can have PAD, but it occurs more frequently in the legs than in the arms. Apart from diabetes, smoking, high blood pressure, atherosclerosis, high cholesterol, and age above 60 are risk factors for PAD. The most typical sign of PAD is a pain in the legs that worsens during physical activity like walking but goes away after rest. However, many PAD sufferers report no leg pain. The buttock, hip, thigh, or calf may experience claudication symptoms, which include soreness, pains, or cramps when walking. Muscle atrophy (weakness), hair loss, smooth, shiny skin, decreased or absent pulses in the feet, sores or ulcers in the legs or feet that don't heal, and chilly or numb toes are physical symptoms in the leg that may indicate PAD. People with PAD are at risk for developing coronary artery disease and cerebrovascular disease, which can lead to a heart attack or stroke.

Pathophysiology of PAD

Chronic hyperglycemia causes:

- Activation of the dormant polyol pathway results in reduced glutathione and increased oxidative stress from reactive oxygen species as a result of the consumption of the coenzyme nicotinamide adenine dinucleotide phosphate.
- Induces the development of inflammatory cytokines and growth factors that lead to vascular damage by causing the synthesis of advanced glycation end products.
- Induces activation of protein kinase C which is responsible for the activation of the nuclear factor κ B, a transcription factor that causes a number of pro-inflammatory genes, to become active.



Nitric oxide (NO-vasodilator), transforming growth factor (TGF), plasminogen activator inhibitor (PAI), is produced less as a result of all of the aforementioned processes, while endothelin-1 (vasoconstrictor) synthesis is enhanced. By modifying the interface

between leucocytes and vascular walls, VSMC migration, and platelet activation, NO inhibits inflammation. In the absence of NO, these anomalies cause increased endothelial permeability, leucocyte chemotaxis, adhesion, and migration into the intima, all of which lead to inflammation. Additionally, low-density lipoprotein (LDL) migrates into the intima where it is oxidised by monocytes to create foam cells, the first atheroma formation precursors. Endothelial injury and hyperglycemia cause platelet adhesion, activation, and aggregation, which are critical in the development of atherosclerosis. Through the consequences of endothelium damage and intima inflammation, hyperglycemia is also linked to dysfunction of vascular smooth muscle cells (VSMC). VSMC migration and proliferation are caused by proinflammatory mediators like platelet-derived growth factors (PDGFs), vascular endothelial growth factors, and cytokines secreted in the inflammatory milieu of the intima. Fatty streaks occur as a result of the interaction between VSMC and endothelial foam cells, and they eventually transform into an atheromatous plaque. Through the mediating actions of PDGF and TGF- β , VSMC produces collagen and an extracellular matrix, which results in plaque and eventual reduction in blood flow.

The etiology of diabetic foot ulcers involves an interplay between polyneuropathy (motor, sensory and autonomic), abnormal foot anatomy, microcirculation changes and PAD. A painless neuropathic foot may be poorly perfused due to PAD, making it difficult to heal. Gangrene can develop as a result of cuts and sores that become infected and don't heal. Foot examination aiming to screen for the presence of peripheral neuropathy, PAD and abnormal foot anatomy can help to predict and prevent the risk of developing a diabetic foot ulcer. To prevent the development of diabetic neuropathy and PAD, it is important for PWD to improve glycemic control by following a healthy lifestyle like doing regular physical activity, healthy eating, avoiding smoking, alcohol and taking medication as prescribed.



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Frequently Asked Questions

1. I am a 35-year-old man with diabetes for the past 10 years now. I am in the marketing profession and usually need to travel every 15 days. My toe has started to get disfigured and I developed a blister on my right foot which isn't healing well. What kind of shoes can I wear and what precautions do I need to follow?

Ans: Diabetes, especially poorly managed/uncontrolled can lead to poor blood circulation and nerve degeneration. This may result in foot infections, blisters, discomfort, and ulcers. Also, disfiguration of the toe (hammertoe) is common. Firstly get your foot examined by your doctor, do not self-treat. Yes, getting the right pair of socks & shoes is important. You need to make sure that the socks you choose do not cause any form of abrasion, keep your feet dry, padded and fitted. They also should keep your feet warm, thus allowing good blood circulation. There are also specially made diabetic shoes for such conditions. They usually have an extra ¼-½ inch depth and will be beneficial, especially for your hammertoe as it will prevent any abrasion and you will have enough space to fit your feet.



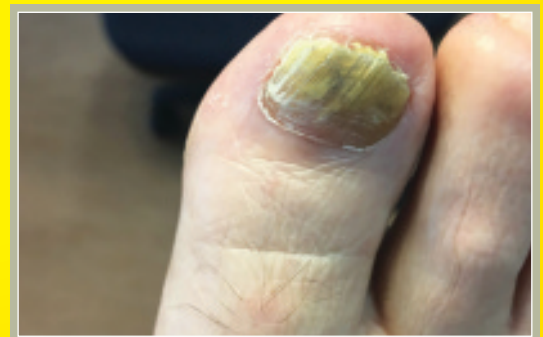
2. My daughter is 20 years old and has type 1 diabetes. She is overweight and has been advised to exercise to get her weight in control. However, lately, she has been experiencing these tingling sensations and sometimes numbness on her feet. What can we do to reduce this and what specific exercises can she do?



Ans: Peripheral neuropathy is a micro-vascular condition of diabetes that damages the nerves in the hands and feet. It can be caused due to uncontrolled diabetes and poor blood circulation. Numbness, tingling sensations, loss of sensations and pain in the extremities are symptoms of nerve damage. Exercise is beneficial as it regulates blood sugar levels, prevents insulin spikes, aids in weight loss and lowers inflammation. Exercise also helps to improve blood circulation. She can start with simple aerobic exercises (walking, cycling, swimming) as they help in stretching/warming up the muscles. Sometimes, neuropathy causes your joints to feel stiff and lose balance. The feet muscles are the ones that keep you upright. Balance building exercises (one leg exercises-hold the wall/chair for balance, walking heel to toe in a straight line are some of the exercises that she can do. Since she has started showing signs of neuropathy, please make her check her feet post-exercise for any kind of blisters, redness, wounds etc and show your doctor if you see any such thing on the feet.

3. My grandmother is 75 years old and suffers from type 2 diabetes since the past 20 years. Recently she developed a fungal infection around her nails. There is also discolouration and disfiguration of her toenail. I do not know what the cause of the infections is. How do I handle this and prevent it?

Ans: 'Onychomycosis' is the medical term for fungal nail infection. Fungal infections can result in thick, discoloured nails that are more prone to breaking and cracking. Toenails tend to get infected more frequently than fingernails. Fungal infections in people with diabetes are more likely to progress to further complications and hence must be treated immediately. Individuals with diabetes may experience poorer outcomes from untreated Onychomycosis than people without diabetes. Therefore, it is crucial to detect and treat it at the earliest. Regular foot checks and making sure her foot is clean and dry are simple ways to prevent any fungal infections.



4. My husband is 57 years old and suffers from diabetes. His glucose levels are completely deranged and fluctuate continuously. A few weeks ago he started developing blisters and sores on the soles of his feet, which later started emitting a foul smell, and the skin colour surrounding it has started to turn into blue colour. How do I treat this? I read online that he will have to amputate his foot. Can this be cured? Please advise.

Ans: What your husband has started developing could be gangrene. Gangrene means the death of the body tissue because of poor blood flow or a serious bacterial infection. High blood glucose levels have an impact on your blood vessels, which reduce the blood flow to your feet. This causes less infection-fighting cells to reach your feet as your circulation is inadequate in that area and wounds/ulcers take longer to heal and are more likely to get infected. Gangrene doesn't mean that the inflamed/infected area needs to be amputated. It's best to get it checked immediately with a doctor to diagnose the stage of gangrene. This will help decide the best method of treatment. If detected at an early stage it can be treated with antibiotics.



Diabetes Foot Screening



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There are differences in diabetes care options between and within nations. This is particularly evident in the case of diabetic foot disease. Diabetes contributes to 80 percent of the 120,000 non-traumatic amputations carried out annually in the US. According to some studies, a limb is amputated every 20 seconds somewhere in the world. The

establishment of an organized program for diabetes foot screening could reduce amputation rates by 75%.

Diabetes foot screening is a crucial part of the systematic, multidisciplinary treatment that individuals with diabetes need, and it is strongly recommended by best practices that are based on evidence. For people with diabetes, not conducting a thorough diabetes foot examination can have negative effects.

Unfortunately, despite being the cheapest, simplest, and the most cost-effective among the four recommended treatment components for routine diabetes prevention, diabetic foot screening is the least used.

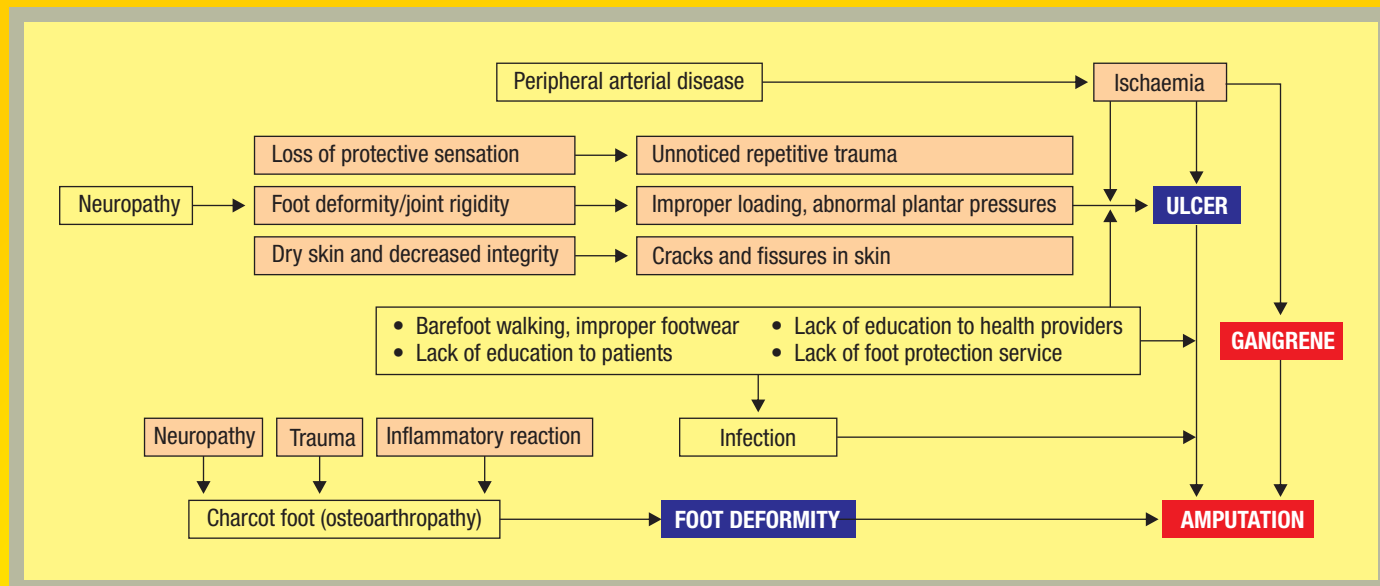


Diabetes foot disease results in

- Reduced protective sensibility
- Local ischemia
- Increasing immune system defects
- Motor neuropathy-related deformity
- PAD-related distal gangrene

These foot alterations may then lead to

- Blisters
- Gangrene
- Avoidable amputations
- Calluses
- Skin ulcers
- Secondary bacterial infections, such as cellulitis and osteomyelitis



How is it diagnosed?

The diagnosis of diabetes foot disease is determined after a thorough history-taking process that includes inquiries about previous foot ulcerations and smoking habits. Even the smallest details, like shoes that suddenly slip off the foot, can signal concern. The condition must be thoroughly examined on the feet in order to be found early. Patients who are at risk for developing foot ulcers can be identified by peripheral neuropathy and peripheral arterial disease screening. Poor glycaemic control and a history of ulcers or amputations raise the risk.

Diabetes foot examination begins with touching the feet of the patients and ends with examining their footwear

With the dorsum of the hand, one can feel the feet's temperature. Increased warmth, with redness and swelling, may indicate inflammation such as acute Charcot foot or cellulitis. A cool foot may indicate ischemia.

At each follow-up, check the feet for any signs of active diseases, such as ulceration or gangrene. Look for lesions that increase the risk of ulceration, such as fungal infections, cracks and skin fissures, malformed nails, macerated web areas, calluses, and deformities like hammer toes, claw toes, and pes cavus.

Screening for peripheral neuropathy

Identification of patients with loss of protective feeling in the feet is the aim of screening. Most recommendations call for using a 10 g monofilament to measure diabetic patients' neuropathy [Fig.1]. When this monofilament bends, it buckles with a force of 10 g. Current consensus defines loss of protecting feeling as the inability to feel a 10 g pressure. The test is simple, affordable, and

portable. A biothesiometer or graduated tuning fork (Rydel Seiffer) to measure vibration perception threshold may be used in combination with the test to screen for neuropathy.

Procedure - Ask the patient to sit or lie down with their legs extended and their soles visible. Placing the monofilament on a delicate area, such as the palm, makes the patient familiar with the process and gets them used to the sensation. No matter how softly a touch is experienced on the soles, instruct the patient to close their eyes and respond "yes" each time. Press the monofilament against the skin at a 90° angle, keep it in place for a few seconds, and then remove it. To prevent the patient from predicting the location of the subsequent application, test various sites in random order with a pause (fake application). During the assessment, if the patient doesn't answer at a site, go back there twice more in random order. Record the outcome as loss of protective sensation if the patient does not experience the sensation each of the three times at the same site. The patient is at risk for issues with their feet if they lose even a single protecting sensory site.



Figure 1. Monofilament test

Test sites and threshold - Most studies advise using 10 sites for testing. The patient has lost protective feeling if they are unable to feel a 10 g monofilament three times at even a single location.

Inter-observer variability - This is said to follow more closely, increasing the likelihood of a false-positive finding. When screening a population where barefoot walking is widespread, use caution before declaring a heel insensate.

Durability of monofilaments - After 100 compression cycles, a 24-hour recovery interval is advised since monofilaments have a tendency to tire with repeated use. A monofilament should be replaced after three months of regular use.

Screening for peripheral arterial disease



Inquire about any history of rest pain and intermittent claudication, both of which point to peripheral arterial disease. Record whether pulsations are missing or present while palpating the dorsal pedis and posterior tibial arteries in both feet.

An additional tool for identifying peripheral arterial disease is the ankle-brachial index. It is calculated using Doppler equipment as the ratio of the maximum systolic blood pressure at the ankle (dorsal pedis artery or posterior tibial artery) to the systolic blood pressure at the arm.

Ankle-brachial index

The severity of the peripheral arterial disease is assessed as follows:

- 0.91-1.3 - Normal
- 0.70-0.90 - Mild obstruction

- 0.40-0.69 - Moderate obstruction
- < 0.40 - Severe obstruction
- >1.3 - Poorly compressible vessel

How can diabetic foot be prevented?

Besides tight glycaemic control. Regular foot inspections by the patient, a family member, and a medical expert are quite beneficial.

Regular foot examination

The recommended follow-up interval is based on the consensus of experts. Continue annual foot exams for those at low risk because they might move up to moderate or high risk. Emphasize the necessity of foot care and glycaemic control monitoring.

In individuals at moderate or high risk, such as those with a foot deformity or a diagnosis of peripheral neuropathy or peripheral arterial disease at the initial examination, more frequent follow-up is indicated.



Patient education

Provide oral and written information about glucose management, fundamental foot care, and risk stratification periodic foot inspection to persons with diabetes, their caretakers, or both.

The primary objective of screening recommendations is to prevent diabetic foot problems, or at least slow down or stop their progression. This necessitates that diabetic patients' feet be periodically examined and cared for by qualified medical professionals. Effective working is challenging due to the high clinical workload leading to differences in the level of care, power relations at work, poor team communication, and a lack of standardized and established clinical foot screening criteria.

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Did You Know?

Best time to buy shoes is in the evening and not morning

In people with diabetes, oedema or swelling in the ankles and feet is common which occurs during the evening. The major reason for this is that there is an increase in the concentration of sugar and salt during the day, causing the body to retain fluid, particularly in the arms and legs. As the quantity of sugar and salt rises in the evening, more water is stored throughout the body. Due to fluid retention, if the foot size is seven in the morning, it may be eight in the evening. If people with diabetes purchase shoes in the morning, there is a high possibility that they might end up being too tight in the evening and even if they buy shoes one size larger than the real size, the shoes may be too loose. Therefore evening is the best time to buy shoes for people with diabetes to get the best fitting shoes which protect the feet from any damage.



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Facts and Figures



According to The International Working Group on the Diabetic Foot, every 20 seconds, some person having diabetes in the world loses their leg due to its complication and even after such amputations, over 50% of these people will die within 5 years.

A study has estimated that around 45,000 legs or foot amputations are being done every year in India which can be avoided by diabetic foot self-care practice.

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What's Trending? Clearing Myth Around Non-nutritive Sweeteners



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The term sweeteners refer to food additives that are used to substitute sugar and give food a sweet flavour, hence assisting in lowering calorie and sugar intake. Caloric sweeteners and "non-calorie/non-nutritive sweeteners [NNSs]/low-caloric sweeteners (LCSs) are the two main types of sweeteners. NNSs, have a sweet flavour, do not

contribute to calories, don't add bulk to food, and are used in modest doses. Steviol glycoside, aspartame, sucralose, neotame, acesulfame potassium and saccharin fall within this category and are approved for use by FDA. The WHO has advised that the total amount of added sugars should be limited to less than 10% (ideally 5%) of the total energy intake. Due to their sweetness, palatability, and addition of no or few calories to food, the usage of NNSs is one of the most crucial measures that may help in substituting the sugar in order to reduce the issue of obesity and associated comorbidities. Numerous studies have shown that replacing sugars with NNSs is effective in treating and preventing obesity and related illnesses.

All NNSs that have been approved as food additives, are safe and can be used within the ADI (The estimated daily NNS consumption that a person can safely ingest on average throughout their lifetime without running the risk of harm is known as acceptable daily intake-ADI.) according to the USFDA [United States Food and Drug Administration], JECFA [Joint FAO/WHO Expert Committee on Food Additives], and EFSA [European Food Safety Authority].

The ADI [mg/kg body weight] as per JECFA for NNS is as follows:

- Saccharin - 5
- Cyclamate - 11
- Aspartame - 40
- Acesulfame potassium - 15
- Sucralose - 15
- Neotame - 2
- Stevia - 4 mg of steviol equivalents or 12 mg of high purity stevia extracts

The possibility that NNSs cause health concerns such as cancer development, renal toxicity, genotoxicity, and neurotoxicity as well as negatively impacting the gut flora is still being debated. The following section debunks some myths associated with NNSs.



NNS and dental health

The occurrence of dental caries is linked to a frequent intake of free sugars. Throughout a person's lifetime, the risk of dental caries is reduced when free sugar intake is kept to less than 10% of total daily energy intake. The usage of NNSs has been shown to affect the oral mucosa's microbial composition, which may be used to lower the risk of developing dental caries. Aspartame, saccharin, and sucralose all exhibit antibacterial action against typical periodontal infections, according to in vitro investigations. The EFSA came to the conclusion in 2011 that the claims made for NNSs like sucralose that they lower postprandial blood sugar levels and maintain tooth mineralization by reducing tooth demineralization were sufficiently supported by scientific data.



NNS and diabetes mellitus



According to the American Diabetes Association, using non-nutritive sweeteners instead of caloric sweeteners without making up the difference in calories from other food sources "has the potential to lower overall calorie and carbohydrate intake." The committee said, "Substituting low-calorie sweetened beverages for sugar-sweetened beverages may help to minimize rises in blood glucose levels associated with high consumption of sugar-sweetened beverages in individuals with diabetes mellitus when used judiciously." NNSs may make it easier for people to consume less calories and added sugars, assist them in achieving and maintaining a healthy body weight, and reduce their risk of developing type 2 diabetes mellitus and

cardiovascular disease. The AHA [American Heart Association] committee said, "Low-calorie sweetened beverages may be a suitable replacement option for people who are habitually high users of sugar-sweetened beverages to reduce intake of sugar-sweetened beverages." Furthermore, clinical data show that neither people with nor without diabetes have a rise in fasting or postprandial glucose levels or insulin levels while using NNSs.

NNS and cancer

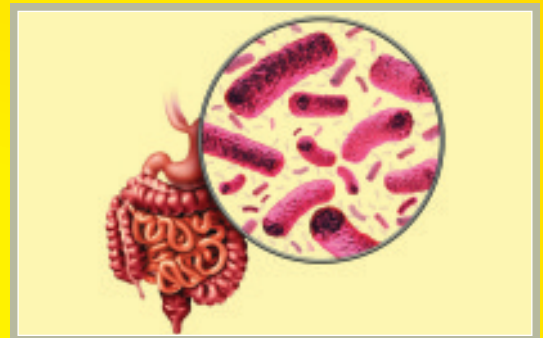
Over the past few decades, there has been much discussion about the potential cancer risk associated with the usage of NNSs. In 1970, the first known instance of NNS-induced cancer came into focus when cyclamate was taken off the market by the USFDA because it may have caused cancer in test animals. However, other nations continued to utilize cyclamate, particularly when combined with other sweeteners, hence it was readmitted to the food



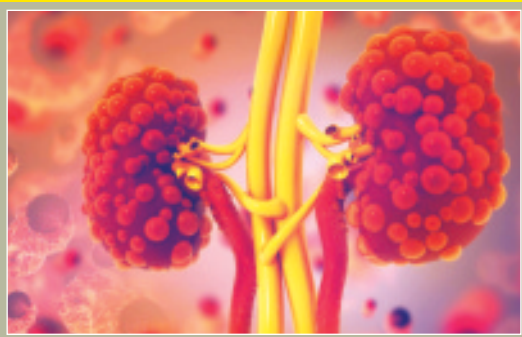
supply after additional assessments of its toxicity by the WHO, the Cancer Assessment Committee of the Centre for Food Safety and Applied Nutrition of the FDA, and the Scientific Committee for Foods of the European Union revealed that it is not a carcinogen. Earlier human epidemiological investigations found a link between extremely high saccharin dosages and an elevated risk of bladder cancer. Further epidemiological investigations on humans, however, were unable to confirm these findings because it was found that saccharin metabolism varied between species. The conclusion that saccharin was not linked to the development of either urinary tract stones or epithelial lesions in people was the result of this.

NNS and gut microbiota

The ACS (American Cancer Society) in 2020 said that "all NNSs appear to be safe when ingested in moderation." Animal models have shown evidence that NNSs change the gut microbiome. A study on mice established a link between exposure to saccharin and aspartame and changes in the gut flora and glucose intolerance. However, a recent human study found that the composition of the gut flora or the formation of short-chain fatty acids is very little impacted by daily intake of pure sucralose or aspartame even in levels indicative of generally high consumption. There are limited human studies to provide enough evidence that NNSs have a negative impact on gut health in doses relevant to usual human consumption.



NNS and renal toxicity



The prevalence of chronic kidney diseases (CKDs) has increased globally as a result of rising rates of obesity and diabetes mellitus. Beverages with added sugar or artificial sweeteners have been linked to CKDs, according to a number of studies. However, the National Kidney Foundation's guidance, *Preparing for Emergencies, A Guide for People with Chronic Kidney Diseases*, suggests including an artificial sweetener as part of an emergency food plan due to the advantages of these substances. When consumed within the ADI, NNSs have been recognised as safe for use in both adults and children by numerous regulatory authorities. Simple sugar substitutions in routine beverages or as tabletop sweeteners rarely raise the likelihood of going over

the ADI. The efficacy and safety of several NNSs in human trials have been established, dispelling the myths around them through systematic reviews, randomised controlled trials, interventional, and observational trials. These studies have proven that substituting NNSs for sugar is a successful weight loss and maintenance therapy for obese individuals.

Resource:

Tiwaskar M, Mohan V. Clearing the Myths around non-nutritive/noncaloric Sweeteners: An Efficacy and Safety Evaluation. *J Assoc Physicians India*. 2022;70(7):18–26.

Start early with

Metformin Hydrochloride 500 mg / 1000 mg SR + Glimepiride 0.5 mg



THE POWER OF BETTER HALF

A forest plot comparing the change in HbA1c (%) for two treatment groups. The y-axis represents the percentage change in HbA1c, ranging from 0 to -0.5. The x-axis represents the percentage change in HbA1c, with a baseline at 0. The Glimepiride + Metformin group shows a change of -0.42% (95% CI: -0.48% to -0.36%), and the Sitagliptin + Metformin group shows a change of -0.30% (95% CI: -0.36% to -0.24%). The p-value is 0.001.

| Treatment Group | Change in HbA1c (%) | 95% CI |
|-------------------------|---------------------|------------------|
| Glimepiride + Metformin | -0.42% | -0.48% to -0.36% |
| Sitagliptin + Metformin | -0.30% | -0.36% to -0.24% |

p=0.001



1. Stathouli-Georgiou TV et al. *Indian J Endocrinol Metab*. 2010 Sep-Oct;24(5):766-769.MR. 2. Siskovic Stee Metab. 2017; 19:1180-1192. 3. Data on file.

Indication

Stärkung der beruflichen Kompetenz des Lehrpersonals und der Schulleitung

Glycine-OP 0.5 Glycine-OP 1.5 Total Glycine-OP 1' Glycine-OP 1:600 Glycine-OP 2' Glycine-OP 2:600 Glycine-OP 3' Glycine-OP 3:600 Glycine-OP 4' Glycine-OP 4:600 Glycine-OP 5' Total Glycine-OP 2' Total Glycine-OP 3' Total Glycine-OP 4' Total

Additional Prescribing Information

[illegible]

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In Patients with high BMI



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1.01 units

5% Weight loss vs
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High Dose Metformin improves
Insulin sensitivity Vs Other OADs



FORte
EVER

Source: 1. JAPI 2020 68:51-55 2. Data on File, 3. Curves 2020; 12(9): e10.7759/curves.1070 4. Diabetes Technology & Therapeutics 2019; 2:79-84 5. Kaina, et al.: Sulfonylurea and combinations: International Task Force India J Endocr Metab 2018;22:132-57.

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 1/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 0.5mg. Glycomet-GP 2/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 1mg. Glycomet-GP 3/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 2mg. Glycomet-GP 4/850: Each uncoated tablet contains metformin hydrochloride IP (as prolonged release form) 1000mg and glimepiride IP 4mg. 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. **Indications:** Glycomet-GP is indicated for the management of patients with type 2 diabetes mellitus (T2DM) when diet, exercise and single agent (metformin hydrochloride or glimepiride alone) do not result in adequate glycemic control. **Dosage and Administration:** Dosage of Glycomet-GP should be individualized on the basis of effectiveness and tolerability while not exceeding the maximum recommended daily dose of glimepiride 8mg and metformin 2000 mg. **Initial dose:** 1 tablet of Glycomet-GP should be administered once daily during breakfast or with the first main meal. Do not crush or chew the tablet. In several cases the tablet may remain intact during transit through the gastrointestinal (GI) tract and will be eliminated in feces as hydrated mass (ghost matrix). Patients should be advised that this is normal as all drug components have already been released during GI transit. **Contraindications:** In patients hypersensitive to glimepiride, other sulfonylureas, other sulfonamides, metformin or any of the excipients of Glycomet-GP; pregnancy and lactation; diabetic ketoacidosis, diabetic pre-coma, in patients with eGFR<30 ml/min/1.73 m², 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 (myocardial infarction, shock, cardiorespiratory failure) hepatic insufficiency, acute alcohol intoxication, alcoholism. **Warnings:** Keep out of reach of children. 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. In case of lactic acidosis, patient should be hospitalized immediately. **Precautions:** In the initial weeks of treatment, the risk of hypoglycemia may be increased and necessitates especially careful monitoring. Serum creatinine levels should be determined before initiating treatment and regularly thereafter: at least annually in patients with normal renal function. Intravascular contrast studies with iodinated materials can lead to acute alteration of renal function. In patients in whom such study is planned, Glycomet-GP should be temporarily discontinued at the time of or prior to the procedure, and withheld for 48 hours subsequent to the procedure and reintroduced only after renal function has been re-evaluated and found to be normal. Use of Glycomet-GP should be discontinued 48 hours before any surgical procedure. **Adverse reactions:** For glimepiride - hypoglycemia; temporary visual impairment; GI symptoms like nausea, vomiting, abdominal pain, diarrhea may occur; increased liver enzymes, cholestasis and jaundice may occur; allergic reactions may occur occasionally. For metformin - GI symptoms like nausea, vomiting, abdominal pain or discomfort may occur.



Your reliable healthcare partner

Self-care Tips for the Foot



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There's a lot to manage if you have diabetes: checking your blood sugar, making healthy food, finding time to be active, taking medicines and going to doctor's appointments. With all that, your feet might be the last thing on your mind. But daily care is one of the best ways to prevent foot complications. Diabetes causes blood vessels to narrow, resulting in poor circulation. Neuropathy or nerve damage is

also a complication of uncontrolled diabetes. Poor circulation makes it difficult for the foot to fight infection and heal while nerve damage may make the foot numb, and one may not be able to diagnose the issue on time. Even a small cut can produce serious consequences. Hence routine foot care is essential for people having diabetes.



- **Check the feet every day:** Check for cuts, redness, swelling, sores, blisters, corns, calluses, or any other change to the skin or nails. Use a hand mirror to look at the bottom of the feet. Wash the feet daily: Keep the feet clean by washing them daily. Refrain from using hot water, instead, use warm soapy water. Never use a heating pad or a hot water bottle.
- **Keep the feet warm and dry:** Dry the feet by patting and carefully drying between the toes. Wear cotton socks and shoes in winter.
- **Moisturize the feet:** Use a moisturizer daily to keep dry skin from itching or cracking. Avoid moisturizing between the toes which could lead to fungal infection.
- **Cut nails carefully:** Trim the toenails straight across and gently smooth any sharp edges with a nail file. Don't cut nails too short, as this could lead to ingrown toenails.
- **Visit the doctor to remove corns or calluses:** Avoid bathroom surgery, medicated pads, or over-the-counter products to remove them.
- **Never go barefoot:** Always wear shoes and socks or slippers, even inside the house, to avoid injury.
- **Choose the right footwear:** For the best fit, try on new shoes at the end of the day when the feet tend to be largest. Before wearing the shoes, check for any sharp objects like small rocks. Wear shoes that fit properly without pinching the toes or rubbing against the feet.
- **Get periodic foot checks:** Visit the foot doctor every year (more often if the person is having nerve damage) for a complete foot examination to prevent foot complications of diabetes.

Resources:

1. Centers for Disease Control and Prevention-Diabetes and Your Feet. Available at: <https://www.cdc.gov/diabetes/library/features/healthy-feet.html>
2. American Diabetes Association-Diabetes Foot Care Tips. Available at: <https://www.diabetes.org/healthy-living/seniors/foot-care-tips#:~:text=Wash%20your%20feet%20well%20every,which%20can%20lead%20to%20infections.>
3. Foot Health Facts-Diabetes Foot Care Guidelines. Available at: <https://www.foothealthfacts.org/conditions/diabetic-foot-care-guidelin>

Different Types of Footwear for Diabetes



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People with diabetes are at an increased risk for foot injuries and poor footwear can be one of the main causes leading to foot ulcers, poor blood circulation and infections. It is for this reason that people with diabetes can invest in special footwear called diabetes shoes which protect the feet from any damage. There are three types of diabetes shoes:

1. In-depth shoes

In-depth shoes are $\frac{1}{4}$ - $\frac{1}{2}$ inches thicker than regular shoes to prevent unnecessary chafing. The additional space effectively relieves pressure on corns and calluses and accommodates custom-moulded orthotics or inserts.

2. Healing shoes

Healing shoes are recommended for those who are recovering from surgery, foot ulcers, or infections. They can be open-toed or close-toed sandals. Doctors generally do not recommend open-toed shoes for people having diabetes as they make them more prone to injury. Close-toed healing shoes lower the risk of further foot complications.

3. Custom-made shoes

Custom-made shoes are designed specifically using the mould of the foot, they are customized as per the requirement. The podiatrist uses 3D scanning equipment to capture every foot curvature, corn, and deformity, and then design a pair of comfortable, personalized diabetic shoes.



Diabetes socks

Diabetes socks are normally non-elastic, seamless, and specially designed to relieve pressure on the foot and lower leg, avoid skin-surface blistering, and minimize moisture build-up. They help to protect the feet and provide maximum comfort. The non-elastic characteristic feature is to prevent constriction due to common foot swelling tendencies. The seamless design is to reduce neurological pain and discomfort by reducing friction to the nerves. These socks always have a small amount of cushioning to prevent injury. Additionally, the socks have improved moisture-repellent properties to prevent moisture and sweat from the shoes from getting trapped between the socks and the foot.

Diabetes socks are not necessary for everyone who has diabetes. It is advised for people whose feet are susceptible to swelling, redness, and irritation patches due to temperature variations. However, all people with diabetes should refrain from using socks that are tight, baggy, and lumpy, as well as those having irritating or rubbing seams.

Tips to buy diabetes footwear

When purchasing diabetes-friendly footwear, the following features should be considered:

- A decent pair of diabetes-friendly shoes should have a flexible, resilient carbon rubber outsole.
- The shoe should be designed from a soft protective material to allow for simple insertion of orthotics and thick insoles, as it relieves heel and foot pain and lessens the pressure on the bottom of the foot.
- The shoe should have a bigger toe space to allow room for movement.
- Always look for shoes with laces as it provides greater support and fit.
- Always put on socks when trying on shoes to provide a better, more precise fit.
- Consider purchasing the shoes in the late afternoon or evening when the feet are likely to be a little larger owing to swelling.
- For the first time, think about wearing the new shoes for two to three hours. This provides enough time to look for wounds or blisters on the feet. Wear the shoes for three to four hours after the first day so that they can gradually become accustomed to them.

Usually, wearing comfortable, well-fitted shoes is enough. However, for people with diabetes who develop minor deformities or impaired circulation, diabetes shoes can become beneficial to relieve pain and other symptoms.



Resources:

1. Different Types Of Diabetic Shoes. Available at: <https://www.cfac.net/2021/12/24/different-types-of-diabetic-shoes/>
2. Diabetes Shoes: How To Find The Right Diabetic Shoes. Available at: <https://www.thediabetescouncil.com/best-shoes-for-diabetes/>
3. Best Socks for Diabetes & Everything You Need to Know About Diabetic Socks. Available at: <https://www.thediabetescouncil.com/everything-you-need-to-know-about-diabetic-socks/>

Diabetic Foot Ulcer and Gangrene



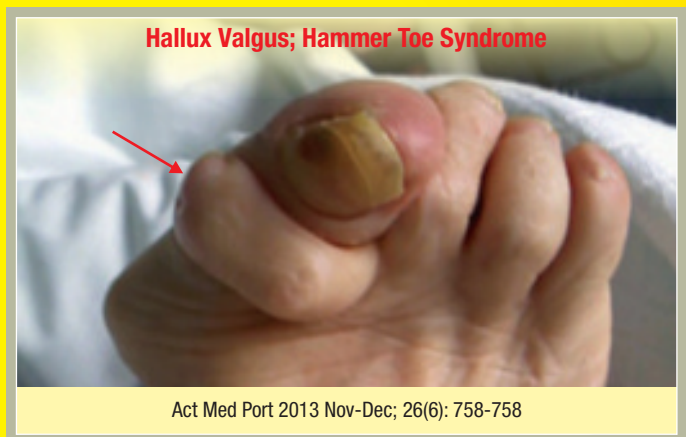
Dr. V. K. Abichandani

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Physician, Ahmedabad

Diabetes is a chronic (long-lasting) health condition that affects how our body turns food into energy. When there isn't enough insulin (insulin insufficiency) or cells stop responding to insulin (insulin resistance), too much blood sugar stays in our bloodstream. Over time, this hyperglycemia can cause serious health problems, such as heart

disease, vision loss, kidney disease, damage to peripheral nerves and a diabetic foot.

It is found that high blood sugar damages the nerves of the foot causing peripheral neuropathy and also hardens the walls of the arteries leading to narrowing of their lumen. This leads to insensate feet with compromised blood supply. As such, people with diabetes do not realize the amount of pressure that is exerted on a particular area, which leads to deformities, ulcers and callus formation. So, if a person with diabetes gets accidentally poked, hurt, cut, or burnt especially in the limbs or extremities like toes and fingers he or she may not be aware because the cut may not cause any discomfort.



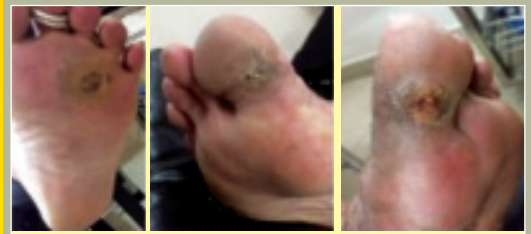
The pain usually alerts a normal person to seek medical attention for a hurt area, which helps to avoid infections. In people with diabetes (PWD) this is lacking, and the wound often gets infected. Diabetes weakens the immune system, which is unable to fight the invading organisms at the wound. High blood sugar makes the local environment more congenial for bacterial and other microorganisms' growth.

Our feet are commonly exposed to injury, bumps and bruises in the activities of daily living. These make PWD more vulnerable to the development of infections, foot ulcers and unfortunately gangrene. Foot infections may affect the bones (osteomyelitis) and invade the bloodstream as well.

Diabetic foot is a common complication of diabetes mellitus, which affects 15% of PWD in their lifetime. Ulcerated diabetic foot is a complex problem. Ischemia (lack of adequate blood supply), neuropathy and infection are the three pathological components that lead to diabetic foot complications, and they frequently occur together as an etiologic triad. In PWD, a combination of neuropathy and

ischemia generally precedes the development of foot infection. Globally, infected diabetic foot ulcer accounts for 50% of all inevitable surgical removal of lower limbs.

Diabetic foot infections are seen often in those with diabetes-associated problems like kidney or eye problems. Those who are prone to cuts, wounds, burns and corns or calluses over their foot are at risk of diabetic foot infections. Bunions (Hallux Valgus) and pressure points are usually starting points of infections and ulcers. Co-morbid obesity, some neuromuscular and rheumatological disorders can limit the ability of the PWD to take appropriate daily care of their feet and predispose such PWD to the development of diabetic foot ulcer (DFU) and infection.



A small break in the skin can lead to tissue destruction and a foot problem, which may result in (unless expertly managed) loss of the foot.



Photograph of the right foot of a 52-year-old Indian lady with a DFU at the dorsum of the foot and dry gangrene of the second and third toes.

People with diabetes and peripheral artery disease are at higher risk for gangrene, which remains the most challenging and distressing complication. Gangrene usually affects PWD with uncontrolled blood sugars. It is the death or decay of the affected foot.

Any DFU should always be considered to have vascular impairment unless otherwise proven. The three key factors associated with limb loss include the degree of tissue loss (**W**ound severity), severity of **I**schemia, and severity of **F**oot **I**nfection (acronym **WIFI**). Effective management requires an interdisciplinary effort (involving podiatry and vascular surgery) focusing on these three vital factors.

Successfully managed diabetic foot



Source: Diabetes Clinic, Global Hospital, Mount Abu









Source: Diabetes Clinic, Global Hospital, Mount Abu

The following is Wagner's classification system routinely used while approaching a case of DFU:

| Wagner classification and current concepts in management of diabetic foot | | |
|---|--|---|
| Grade-0 | Foot at risk | Prevention |
| Grade-I | Localized, superficial ulcer | Antibiotic & glycemic control |
| Grade-II | Deep ulcer to bone, ligament, or joint | Debridement, antibiotics and glycemic control |
| Grade-III | Deep abscess, osteomyelitis | Debridement, some form of amputation |
| Grade-IV | Gangrene of toes, forefoot | Wide debridement and amputation |
| Grade-V | Gangrene of entire foot | Below knee amputation |

Mehraj, M. (2018) A review of Wagner classification and current concepts in management of diabetic foot. *International Journal of Orthopaedics Sciences*, 4, 933-935.

| | | | | | |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
| Grade 0 No open lesion | Grade 1 Superficial lesion | Grade 2 Deep ulcer | Grade 3 Abscess/ osteomyelitis | Grade 4 Partial foot gangrene | Grade 5 Whole foot gangrene |

Effective management of diabetic foot can reduce the severity of complications such as preventable amputations and possible mortality and can also improve the overall quality of life. PWD are best advised to have their feet checked at least once a year. However, one may need more frequent check-ups if one has additional risk factors, such as peripheral neuropathy (numbness in the hands and feet), retinopathy (involvement of the retina in the eyes), kidney involvement or a history of foot ulcers.

One of the more sinister foot problems that can occur due to diabetic neuropathy is Charcot arthropathy. This condition occurs due to undetected injuries to the bones of the foot, which can lead to grave deformity and disability. Foot and ankle deformities lead to the development of pressure sores, ulcers, infections and the need for amputation. Amongst patients with previous foot ulcers, 58–83% will develop another ulcer within 1 year if no preventive services are provided. When therapeutic shoes and insoles are provided, the incidence of ulcer recurrence decreases by 50% to 30–50% annually.

Charcot neuro-arthropathy in diabetes leads to ulceration



The proverb “prevention is better than cure” is particularly appropriate when talking about the prevention of DFUs. The following is a useful list of “Dos” and “Don’ts” that can help prevent a DFU from developing:

Some Important Dos and Don’ts To Prevent DFU

| Dos | Don’ts |
|---|---|
| <ol style="list-style-type: none"> 1. Be cognizant of the risk factors for DFU and which ones apply to yourself. 2. Maintain optimal foot skin and toenail hygiene, lubrication and care. 3. Wear appropriate protective footwear. 4. Select appropriate activities for your disabilities and fitness. 5. Optimize body weight. 6. Follow medication and diabetes management regimens. 7. Inspect feet after removing shoes. 8. Wear white socks (to immediately recognize drainage from a wound) if foot deformities present or a previous DFU. 9. Have a PCP to advise regarding the above do's and discuss new foot problems or concerns. | <ol style="list-style-type: none"> 1. Walk barefooted. 2. Use dry heat (eg, hair dryer) on your feet or soak feet in hot water. 3. Use chemicals or sharp objects to remove calluses from feet. 4. Trim ingrown or fungal infected toenails, especially if vision is poor or flexibility interferes with visualizing toe-nails; don't use nail polish. 5. Wear new shoes without frequent checks for possible pressure sores. 6. Wear leg garters or socks with tightly constricting bands. 7. Wear inappropriate shoes such as thongs or sandals. 8. Smoke |

Lisa Nhan, DPM, Michael B. Strauss, MD, Stuart S. Miller, MD (2013) 'Preventing Diabetic Foot Ulcers: A 4-Pronged Approach' *Consultant* 360, Volume 53-Issue 12- December 2013.

Regular foot examination, patient education, embracing hygienic practices, wearing appropriate footwear, and promptly attending to minor injuries can decrease ulcer occurrence by 50% and eliminate the need for major amputation in many PWD.

Resources:

1. Rogers LC, Andros G, Caporusso J, Harkless LB, Mills JL Sr, Armstrong DG. Toe and flow: essential components and structure of the amputation prevention team. *J Vasc Surg*. 2010;52(3 Suppl):23S-27S. doi:10.1016/j.jvs.2010.06.004
2. Sumpio BE, Armstrong DG, Lavery LA, Andros G; Society for Vascular Surgery; American Podiatric Medical Association. The role of interdisciplinary team approach in the management of the diabetic foot: a joint statement from the Society for Vascular Surgery and the American Podiatric Medical Association. *J Am Podiatr Med Assoc*. 2010;100(4):309-311. doi:10.7547/1000309
3. Alexiadou K, Doupis J. Management of diabetic foot ulcers. *Diabetes Ther*. 2012;3(1):4. doi:10.1007/s13300-012-0004-9
4. Mehraj, M. (2018). A review of Wagner classification and current concepts in management of diabetic foot. *International Journal of Orthopaedics Sciences*. 2018, 4, 933-935.
5. Carson James Smith, MD, Taylor Beahrs, MD, Brian M. Weatherford, MD; (2022) ' Diabetic (Charcot) Foot) Available at: <https://orthoinfo.aaos.org/en/diseases--conditions/diabetic-charcot-foot/>

Diabetes Educator Tip of the Month



Contributed by
Name: Sharleen Zacharia

Qualifications: MSc Food Nutrition and Dietetics

Foot problems - Watch out for these red flags

Foot problems in diabetes are preventable complications. The best way to prevent foot problems is daily foot care and regular doctor visits for foot examinations. Do not wait for your next checkup if you encounter any of these symptoms.

Watch out for the listed symptoms and visit your doctor immediately:

- Leg pain, cramps in the calves and thighs while exercising
- Tingling/burning sensations of the extremities, especially the feet
- Loss of sensation, unable to feel hot/cold temperatures
- Fungal infection on the feet
- Cracking of skin around your soles, blisters, ulcers and non-healing wounds
- Alterations in the shape of your toes
- Dryness of skin on the feet
- Feet feeling cold
- Ingrowth of toenail
- Any discolouration



Resources:

1. Centers for Disease Control and Prevention. <https://www.cdc.gov/diabetes/library/features/healthy-feet.html>. Published 2021. Accessed July 28, 2022.

Superfood: Horsegram (Kulith)

Horse gram is an important pulse crop and is commonly called Kulattha, kulith, Kollu or Ullavallu. It is a traditional crop, cultivated in different parts of India.

It is termed a functional food as it exhibits excellent therapeutic properties. It is used in the treatment of asthma, bronchitis, heart diseases, urinary diseases, piles and also for regularising irregular menstrual cycles. Due to the presence of bio-active compounds, it possesses anti-diabetic properties and is useful in the dietary management of obesity.



Nutritional benefits

- Economical source of protein
- Rich source of minerals like potassium, calcium, zinc, magnesium, iron
- Source of B vitamins
- Anti-inflammatory and antioxidant properties

Health benefits

1. Antidiabetic

- The presence of resistant starch allows a slow release of glucose in the bloodstream thereby helping in managing blood glucose levels in people with diabetes.

2. Anti-inflammatory

- Horse gram has Bowman birk type enzyme inhibitors so it shows anti-inflammatory activity and is useful in the treatment of ulcerative colitis and multiple sclerosis.

3. Antioxidant effect

- Horse gram is a rich source of flavonoids and hence imparts the antioxidant effect. Some of the flavonoids found in horsegram are quercetin, keampferol, and myricetin.

4. Cardiovascular effects

- The presence of soluble and insoluble fibre-cellulose, hemicellulose, pectin and beta-glucan in horse gram helps in the management of obesity, cardiovascular diseases, reduction in serum cholesterol, lowering blood glucose levels and relieves constipation.

How to consume?

Horse gram flour can be consumed in the form of horse gram flour curry (pithla). It can even be incorporated in chapatti atta along with wheat to make chapattis or bhakari. Sprouted horse gram seeds can be consumed in form of usal, sundal, or soupy dal.



Recommended intake

30 gm of sprouted horse gram contains 6.5 g of proteins, 17 g of carbohydrates and 0.1 g of fat.

Resources:

1. Bhartiya Anuradha, Aditya, *et al.* Nutritional and remedial potential of an underutilized food legume horsegram (*Macrotyloma uniflorum*): A review. *Journal of Animal and Plant Sciences*.2015; 25. 908-920.
2. Ingle, Krishnananda, Al-Khayri, *et al.* Bioactive Compounds of Horse Gram (*Macrotyloma uniflorum* Lam. [Verdc.]). 2020;10.1007/978-3-030-44578-2_36-1

Recipe: Horse Gram Flour Curry – Kulith Pithla

Serves: 2

| Ingredients | Amounts |
|-------------------------------|----------------|
| Horse Gram flour/Kulith atta | ¼ cup |
| Onion | ½ cup |
| Garlic finely chopped | 1 ½ tsp. |
| Green chillies finely chopped | 2 nos. |
| Turmeric powder | ¼ tsp. |
| Asafoetida | ¼ tsp. |
| Kokum | 2-3 nos. |
| Curry leaves | 5-6 nos. |
| Coriander leaves-chopped | For garnishing |
| Mustard seeds | ¼ tsp. |
| Dry red chillies | 2 nos. |
| Water | 2 ½ cups |
| Oil | 1 tsp. |
| Salt | To taste |

1 cup: 250 ml; 1 tablespoon: 15ml; 1 teaspoon: 5ml



Method

1. Mix Kulith flour in ½ cup water and keep aside.
2. Heat oil in a deep-bottomed pan. When hot add mustard seeds, asafoetida, turmeric powder, dry red chillies and curry leaves.
3. When seeds start to splutter, add onions, green chillies and garlic. Sauté onions till they have changed colour.
4. Add 2 cups of water and bring to boil. Once the water boils then add the mix of Kulith flour and water, to the boiling mixture. Cover and cook for 10 minutes. Add salt. Once cooked, add kokum and let it boil for another 5 mins. Switch off the flame.
5. Garnish with coriander leaves. Serve hot. Can be consumed with chapatti.

Dia-Games

Diabetes and Feet

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BLISTERS
NEUROPATHY
BIOTHESIOMETER
MONOFILAMENT
ONYCHOMYCOSIS
AMPUTATION
GANGRENE
HAMMER TOE
CALLUS
CHARCOTS FOOT

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| T | B | L | I | S | T | E | R | S | M | R | M | S | A |
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Patient Speaks

I am Anil Dewan, a 55-year-old man. I have been living with diabetes for the last 9 years. My blood glucose levels are well maintained now with the advice and help of my doctor and diabetes educator. However, to start with, when I was initially diagnosed with diabetes, I was not as careful as I needed to be.

I was not very regular in visiting my doctor or in doing the follow-up tests as suggested. As a result, my blood glucose levels were not in control at all.

One day my daughter noticed some blood spots on the floor and made us aware of it. None of us in the house had got hurt so we all started checking ourselves and to my surprise my feet had blood oozing out and I did not even know! I looked carefully and noticed that I had hurt myself and there was a wound which was bleeding and I did not even notice it. This rang an alarm in my head and the next day I visited my doctor. He made me do some tests and also checked for sensation in my feet which was low. He wrote down some medications and referred me to a DE.

I went to the DE and narrated this incident. She counselled me and made me aware of how I was saved since my daughter noticed the blood and I could take treatment immediately. I got to know that the wound could have got infected and could lead to scary consequences one of which could have been amputation. I was shocked. I also came to understand that high blood glucose levels had led to poor circulation and had damaged my nerves due to which I could not feel any pain in the feet. I was advised by the DE to check my feet thoroughly daily. She gave me all the tips for foot care. I adhered to what my doctor and DE had recommended and since then my blood glucose has been in control. I make sure I check my feet daily and regularly follow up with my doctor.

I am very thankful to my DE for guiding me on foot care as well as living a healthier lifestyle.



NOTES

This image shows a single sheet of bright yellow paper. It features horizontal ruling lines spaced evenly across its surface, typical of notebook paper. The lines are thin and dark, contrasting with the vibrant yellow background. There are no margins, text, or other markings on the page.

NOTES

[illegible]

Beat Diabetes

Win Life

Published in
D-TechCon

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OF DIABETES
TECHNOLOGY

For all your new & existing people with diabetes



**Diabetes Knowledge
Improvement with this course**

Basic,
Non Aware &
Partial Diabetes
Knowledge

80%

Advanced
Diabetes
Knowledge

Diabetes Education Certificate Course In your name



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& easy
steps for
patients**

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Choose from
12 languages

Access course
(12 Modules)

**12 Must
to know
topics**

Basics of Blood Sugar

Understanding High Blood Sugar

Blood sugar monitoring

Know your Risk

Heart & Kidney link

Diabetes & footcare

Diabetes & Eyes

High Blood sugar & Immunity

Medication adherence

Self management of Blood sugar

Safe feasting & fasting

Healthy habits

**Well
informed
adherent
patients**

Patients to
give tests to
check their
knowledge
on each

Reports are
visible in
dashboard

Certificates and
badges will be
sent on your
behalf

An awareness initiative by



In T2DM Across Continuum,

Start with

Glycomet®-GP 1/2

Metformin Hydrochloride 500 mg SR + Glimepiride 1/2 mg



Source: 1. JAPI 2020 68,51-55 2. Data on File, 3. Cureus 2020; 12(9): e10.7759/cureus.1070 4. Diabetes Technology & Therapeutics 2019, 2,79-84 5. Kalra, et al.: Sulfonylurea and combinations: International Task Force Indian J Endocr Metab 2018;22:132-57.

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. **Indications:** Glycomet GP is indicated for the management of patients with type 2 diabetes mellitus (T2DM) when diet, exercise and single agent (metformin hydrochloride or glimepiride alone) do not result in adequate glycemic control. **Dosage and Administration:** Dosage of Glycomet GP should be individualized on the basis of effectiveness and tolerability while not exceeding the maximum recommended daily dose of glimepiride 8mg and metformin 2000 mg. **Initial dose:** 1 tablet of Glycomet GP should be administered once daily during breakfast or with the first main meal. Do not crush or chew the tablet. In several cases the tablet may remain intact during transit through the gastrointestinal (GI) tract and will be eliminated in feces as hydrated mass (ghost matrix). Patients should be advised that this is normal as all drug components have already been released during GI transit. **Contraindications:** In patients hypersensitive to glimepiride, other sulfonylureas, other sulfonamides, metformin or any of the excipients of Glycomet GP; pregnancy and lactation; diabetic ketoacidosis, diabetic pre-coma, in patients with eGFR<30 ml/min/ 1.73 m2, 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 (myocardial infarction, shock, cardiac/respiratory failure) hepatic insufficiency, acute alcohol intoxication, alcoholism. **Warnings:** Keep out of reach of children. 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. In case of lactic acidosis, patient should be hospitalized immediately. **Precautions:** In the initial weeks of treatment, the risk of hypoglycemia may be increased and necessitates especially careful monitoring. Serum creatinine levels should be determined before initiating treatment and regularly thereafter: at least annually in patients with normal renal function. Intravascular contrast studies with iodinated materials can lead to acute alteration of renal function. In patients in whom such study is planned, Glycomet GP should be temporarily discontinued at the time of or prior to the procedure, and withheld for 48 hours subsequent to the procedure and reinstituted only after renal function has been re-evaluated and found to be normal. Use of Glycomet GP should be discontinued 48 hours before any surgical procedure. **Adverse reactions:** For glimepiride - hypoglycaemia; temporary visual impairment; GI symptoms like nausea, vomiting, abdominal pain, diarrhoea may occur; increased liver enzymes, cholestasis and jaundice may occur; allergic reactions may occur occasionally. For metformin - GI symptoms like nausea, vomiting, abdominal pain or discomfort may occur.



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