NCD Newsletter

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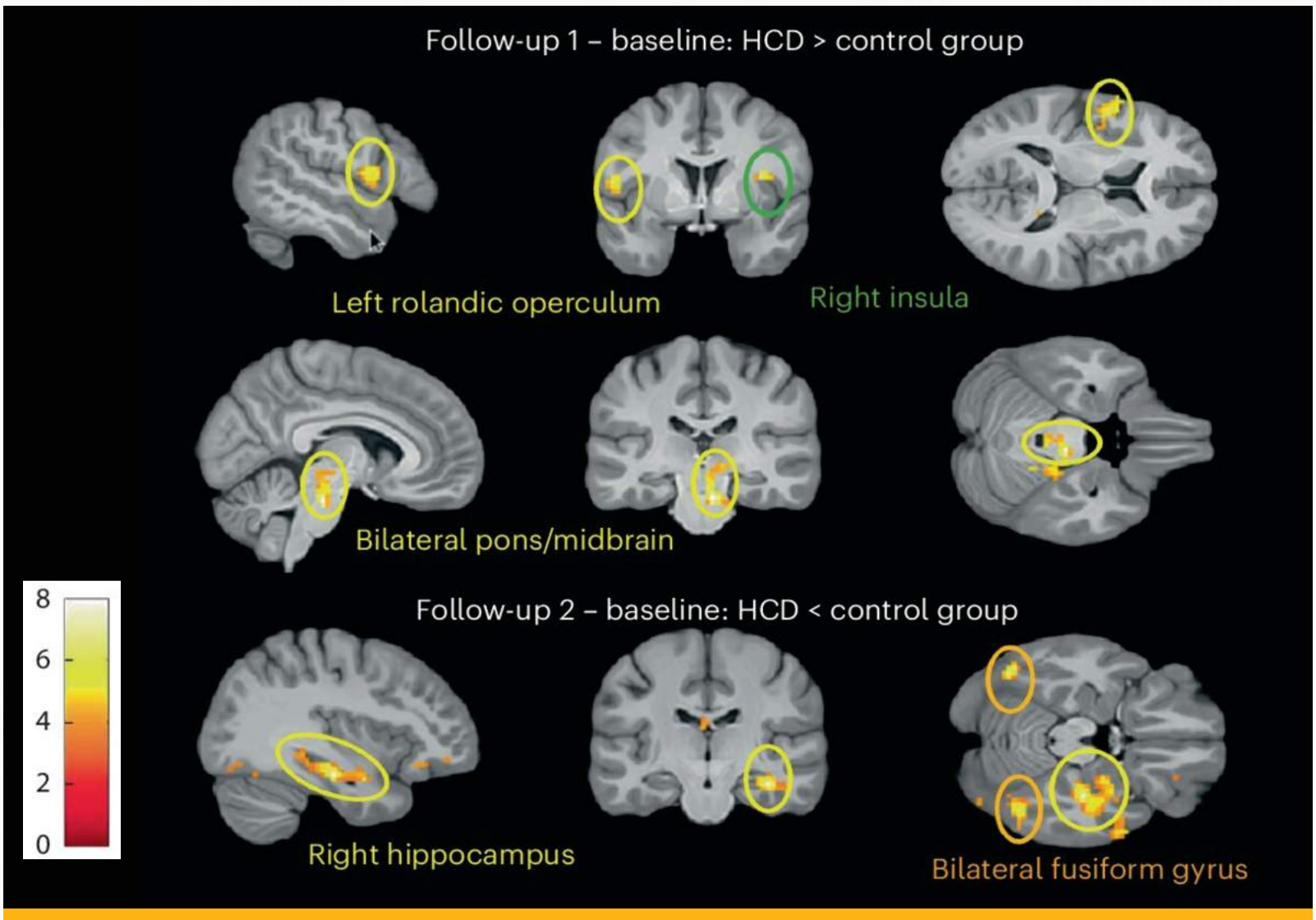
Brain on Overload: Can Just Five Days of Overeating Disrupt Insulin Response!!!



Disrupted brain insulin action after short-term overeating with calorie-rich snacks

A new study published in Nature Metabolism (2025) has revealed that indulging in calorie-rich snacks for just five days can impair the brain's insulin responsiveness, alter reward learning, and increase liver fat even in healthy young adults. This groundbreaking research, conducted by the Institute for Diabetes Research and Metabolic Diseases of the Helmholtz Center Munich at the University of Tübingen, in collaboration with the German Center for Diabetes Research, sheds light on how short-term dietary choices can have prolonged effects on metabolism and brain function.

The Study: Five Days to Change Your Brain

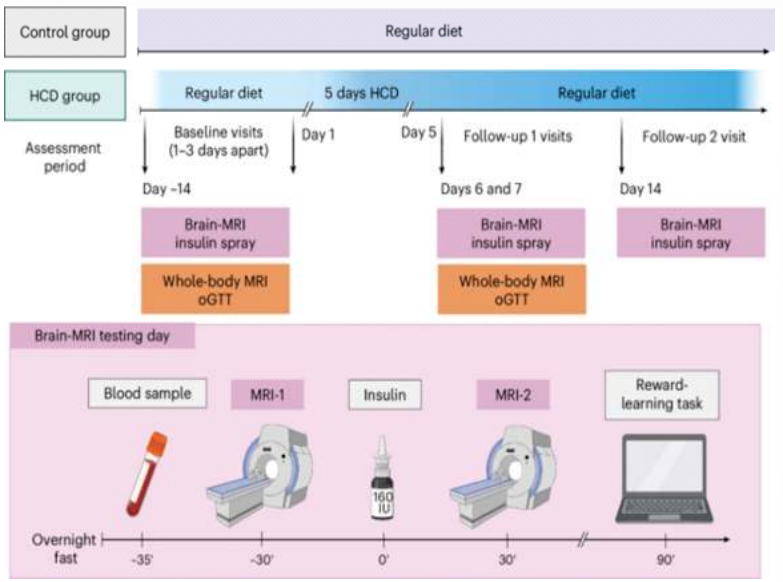
The study investigated how an ultra-processed, high-caloric diet (HCD) affects brain insulin action before any significant weight gain occurs. Researchers enrolled 29 healthy men, aged 19–27 years, with normal BMI (19–25 kg/m^2). Participants were divided into two groups: one consuming an extra 1,500 kcal per day from ultra-processed snacks (HCD group) and a control group maintaining a regular diet. Their physical activity was also restricted to under 4,000 steps per day to minimise variations in energy expenditure.

At the end of just five days, those in the HCD group showed a significant increase in liver fat from 1.55% at baseline to 2.54% post-intervention despite no significant weight gain. Brain insulin responsiveness was measured using functional MRI (fMRI) scans combined with intranasal insulin administration, revealing critical changes in brain activity.

Disrupting Brain Signals & Reward Learning

Insulin plays a crucial role in appetite regulation and metabolism. Disruptions in brain insulin signalling are linked to obesity, type 2 diabetes, and cognitive dysfunction. This study found that short-term overeating increased insulin activity in certain brain regions immediately after the intervention. However, one week after returning to a normal diet, insulin response significantly declined in cognitive areas such as the hippocampus and fusiform gyrus, suggesting lingering metabolic effects.

Furthermore, the study explored the impact of overeating on reward learning-a process that influences food-related decisions. Participants in the HCD group exhibited decreased sensitivity to rewards and heightened sensitivity to punishments in a go/no-go reinforcement learning task. This shift could prime individuals for long-term unhealthy eating patterns, as reduced reward sensitivity has been linked to increased cravings for calorie-dense foods in individuals with obesity.



Lasting Effects Beyond the Diet

One of the most concerning findings was that even after resuming a normal diet, the brain did not fully revert to its baseline state within a week. White matter integrity—critical for efficient brain communication-showed reduced integrity in major neural pathways, including the inferior frontal-occipital fasciculus and corpus callosum, raising concerns about long-term consequences of short-term indulgence.

The Bigger Picture: Implications for Public Health

These findings challenge the notion that short-term indulgence has no lasting impact. They suggest that even brief periods of overeating can prime the brain for future unhealthy eating behaviors and metabolic disturbances. With rising rates of obesity and metabolic disorders worldwide, understanding the neurological effects of diet is crucial in shaping preventive strategies.

This study highlights the need for mindful eating and reinforces the importance of dietary choices, even in the short term. The brain's response to food is more complex than previously thought, and just a few days of overindulgence may set the stage for long-term metabolic consequences.

Credit: *Nature Metabolism (2025)*

EARLY BLOOD TEST MAY HELP DIFFERENTIATE STROKE TYPES BEFORE HOSPITAL ARRIVAL

A groundbreaking study from Germany suggests that a simple blood test measuring **glial fibrillary acidic protein (GFAP)** levels could help distinguish between hemorrhagic (bleeding) and ischemic (clot-caused) strokes even before patients reach the hospital. This finding, set to be presented at the American Stroke Association's International Stroke Conference 2025, could revolutionize prehospital stroke care and significantly improve treatment outcomes.

Why Rapid Stroke Diagnosis Matters

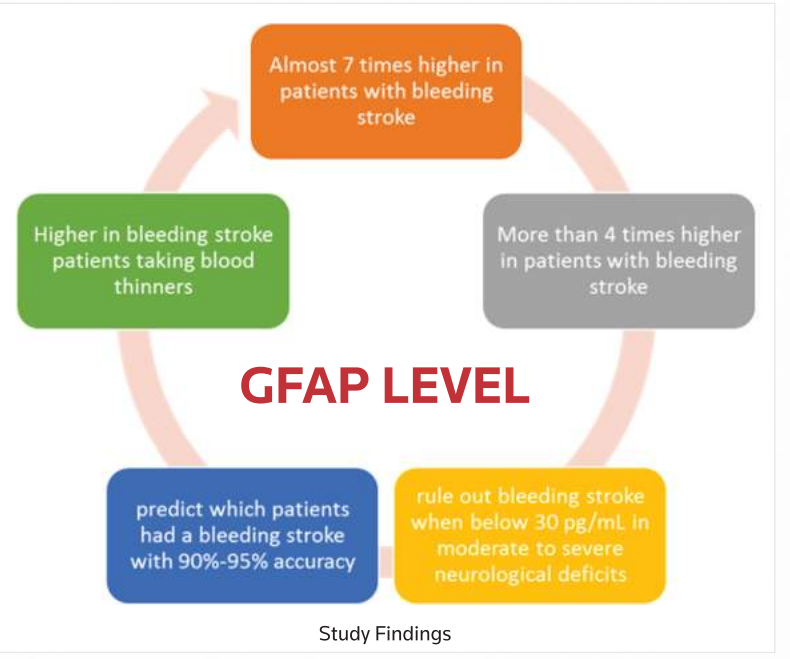
The more time that elapses before a stroke is diagnosed and treated, the greater the risk of irreversible brain damage. Stroke symptoms alone do not confirm whether the event is hemorrhagic or ischemic, and distinguishing between the two is critical because they require opposite treatments. While ischemic strokes are treated with clot-busting drugs or mechanical clot removal, hemorrhagic strokes require measures to control bleeding, such as lowering blood pressure and reversing blood-thinning medications.

Currently, the standard approach involves brain imaging, which can be delayed while patients are stabilized, transported, and taken for scans-during which vital brain tissue continues to die. The potential to determine stroke type using a blood test in an ambulance setting could be a game-changer, enabling faster, more targeted treatment.

Key Findings from the Study

Led by Dr. Love-Preet Kalra, a neurology resident at RKH Hospital Klinikum Ludwigsburg in Germany, researchers analyzed blood levels of GFAP, a protein released into the bloodstream when brain cells are damaged. The study examined 353 patients (average age 75, 47% women) who arrived at the emergency room within six hours of stroke symptom onset. Blood samples were collected by emergency medical services (EMS) before hospital arrival and later analyzed using a portable blood analyzer. The findings revealed:

- GFAP levels were nearly seven times higher in hemorrhagic stroke patients than in those with ischemic stroke (208 pg/mL vs. 30 pg/mL).
- GFAP levels were over four times higher in bleeding stroke patients than in those with conditions mimicking a stroke (208 pg/mL vs. 48 pg/mL).
- A GFAP level below 30 pg/mL effectively ruled out hemorrhagic stroke in patients with moderate to severe neurological deficits.
- When using age-based cut-off points, the test predicted stroke type with 90%-95% accuracy across three age groups: below 72, between 72 and 83, and above 83 years.
- GFAP levels were significantly higher in bleeding stroke patients taking blood thinners than in those not on anticoagulation therapy.



Study Findings

Dr. Kalra noted that he was particularly surprised by the extremely elevated GFAP values in patients with blood thinner-associated bleeding strokes and the ability to exclude hemorrhagic stroke in all cases where GFAP was below 30 pg/mL in moderately or severely affected patients.

Clinical Implications and Challenges

If confirmed in larger studies, early GFAP measurement could change how stroke patients are treated in the field. Treatment to lower blood pressure and reverse blood-thinning medications could begin immediately in the ambulance, potentially reducing complications and improving patient outcomes. In the future, even clot-busting drugs could be administered prehospital, drastically reducing the time to treatment.

However, challenges remain before this test can be widely implemented. A centrifugation step is currently required to process the blood, and most ambulances and EMS teams do not yet have access to portable GFAP testing equipment. Additionally, GFAP levels increase with age, creating a grey zone where small hemorrhagic strokes might be missed or misclassified as ischemic strokes in older patients.

Expert Perspective

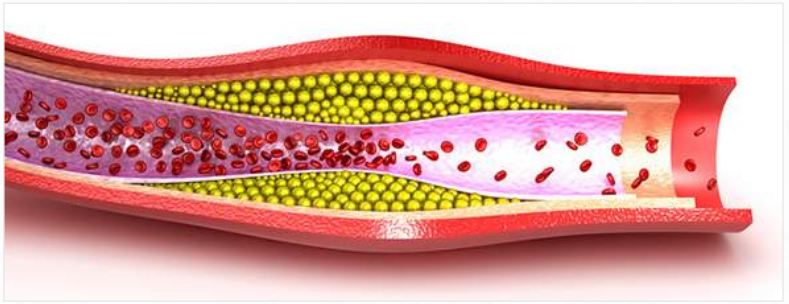
Commenting on the study, American Heart Association expert volunteer Dr. Louise D. McCullough, Chair of Neurology at McGovern Medical School and Chief of Neurology at Memorial Hermann Hospital-Texas Medical Center, highlighted the potential of GFAP as a useful prehospital test for assessing brain injuries. However, she cautioned that the relatively small sample size and the need for point-of-care testing availability are significant hurdles that must be addressed before widespread clinical adoption.

Looking Ahead

While more extensive trials are needed to validate these findings, this study represents a promising step toward faster, more accurate stroke diagnosis in emergency settings. If adopted into routine EMS practice, GFAP testing could significantly reduce the time to appropriate stroke treatment, ultimately saving lives and preventing long-term disability.

Reference: American Stroke Association International Stroke Conference 2025 - Abstract 47

EFFECTIVE DYSLIPIDEMIA MANAGEMENT MAY HELP PRESERVE KIDNEY FUNCTION IN INDIVIDUALS WITH DIABETES



A retrospective study published in "Frontiers in Endocrinology" suggests that effective dyslipidemia management may play a crucial role in preserving kidney function in individuals with diabetes. The study found that elevated triglyceride levels and reduced high-density lipoprotein (HDL) levels were linked to an increased risk of albuminuria and a decline in estimated glomerular filtration rate (eGFR)—key markers of kidney function.

Dyslipidemia is a common complication in diabetic kidney disease (DKD) and contributes to both disease progression and cardiovascular risks. Researchers emphasize that early lipid management in DKD is essential, as conventional lipid-lowering therapies—such as statins and fibrates—have limitations, particularly in terms of renal safety. Prior studies have already established a link between dyslipidemia, atherosclerotic cardiovascular disease (ASCVD), and DKD progression, underscoring the need for targeted lipid interventions to mitigate kidney damage.

Study Overview and Findings

The study was led by Qian Ming Tu and colleagues from the Department of General Medicine, Shanghai Putuo District Changzheng Town Community Health Service Center, Shanghai, China. The researchers conducted a comprehensive literature review across databases like PubMed, Web of Science, and EMBASE using keywords such as "diabetic kidney disease," "diabetic nephropathy," "diabetes," "dyslipidemia," "kidney," "cardiovascular disease," and "lipid therapy." Their analysis focused on the clinical characteristics of dyslipidemia, its role in lipid-induced renal injury, and recent advancements in lipid-lowering therapies for DKD.

The key findings of the study include

- High triglyceride (TG) levels and low HDL levels were associated with a greater risk of albuminuria and eGFR decline, suggesting that lipid abnormalities contribute directly to kidney damage.
- Abnormal lipid metabolism led to glomerular podocyte and renal tubular epithelial cell damage due to ectopic lipid deposition, which impaired kidney filtration and increased urinary albumin excretion.
- Lipid-lowering therapies helped reduce lipid accumulation, suppressed inflammatory mediators, and mitigated renal fibrosis, thereby offering potential renal protection.
- Fibrates and statins were found to lower albuminuria and slow eGFR decline in early DKD, although their long-term renal impact remains uncertain.
- Pro-protein convertase subtilisin/kexin 9 (PCSK9)-targeted treatments demonstrated fewer renal side effects while being more effective than statins and fibrates in reducing inflammation and improving kidney function.

Clinical Implications and Future Directions

The authors emphasized the critical role of lipid management in diabetic kidney disease, noting that abnormal lipid metabolism contributes to renal impairment. While traditional lipid-lowering therapies like statins and fibrates can reduce inflammation and slow kidney decline, concerns remain about their long-term renal safety. PCSK9-targeted therapies, on the other hand, appear to provide a safer and more effective alternative with better renal outcomes.

Furthermore, the researchers highlighted LDL apheresis and double filtration plasmapheresis as promising treatment options for patients with severe hypercholesterolemia or drug intolerance. Given the variability in lipid profiles among DKD patients, they stressed the need for personalized treatment strategies to optimize renal outcomes and improve disease management.

Reference: Tu, Q. M., Jin, H. M., & Yang, X. H. (2025). Lipid abnormality in diabetic kidney disease and potential treatment advancements. Frontiers in Endocrinology, 16, 1503711. https://doi.org/10.3389/fendo.2025.1503711

FDA DRUG APPROVALS

1. FDA Approves First Rapid-Acting Insulin Biosimilar Product for Treatment of Diabetes

On February 14, 2025, the U.S. Food and Drug Administration (FDA) approved Merilog (insulin-aspart-szjj) as a biosimilar to Novolog (insulin aspart) for improving glycemic control in adults and pediatric patients with diabetes mellitus. This marks a significant milestone as Merilog is the first rapid-acting insulin biosimilar product to receive FDA approval. The product is available in both 3 mL single-patient-use prefilled pens and 10 mL multiple-dose vials.

Merilog joins the two long-acting insulin biosimilar products that the FDA approved in 2021, further expanding treatment options for diabetes management. Biosimilar products offers safe and effective alternatives to existing biologic medications, helping to increase accessibility and potentially lower costs to patients.

The FDA has now approved three biosimilar insulin products to treat diabetes," said Dr. Peter Stein, director of the Office of New Drugs in the FDA's Center for Drug Evaluation and Research. "Today's approval highlights our continued efforts to improve the efficiency of the biosimilar approval process to help support a competitive marketplace and increase options for costly treatments, like insulin. Increasing access to safe, effective, and high-quality medications at potentially lower cost remains a continued priority for the FDA.

Biological products, including insulin, are used to treat various serious illnesses and chronic conditions. Biosimilars are highly similar to FDA-approved biologic products and have no clinically meaningful differences in safety, purity, and potency. To date, the FDA has approved 65 biosimilar products for various health conditions.

Diabetes affects over 38 million people in the U.S., and approximately 8.4 million Americans rely on insulin therapy to manage their condition. Insulin helps regulate blood sugar levels, preventing complications associated with diabetes. Merilog, like Novolog, is a rapid-acting insulin that works by lowering mealtime blood sugar spikes. It should be administered 5 to 10 minutes before a meal and injected subcutaneously into the stomach, buttocks, thighs, or upper arms.

While Merilog provides an important new option for diabetes treatment, it also carries potential risks. Serious side effects include: hypoglycemia, Severe allergic reactions, and hypokalemia (low potassium levels in the blood) Other common side effects include injection site reactions, itching, rash, skin thickening (lipodystrophy), weight gain, and swelling in hands and feet.

"For the millions of people who rely on daily injections of insulin for the treatment of diabetes, having a biosimilar option for their rapid-acting insulin injection can truly make a difference, as biosimilar products have the potential to increase access to these life-saving medications," said Dr Sarah Yim, director of the Office of Therapeutic Biologics and Biosimilars at the FDA.

2. FDA Approved First-in-Class Non-Opioid Analgesic to Treat Moderate to Severe Acute Pain in Adults

January 31, 2025

In a significant advancement for pain management, the U.S. Food and Drug Administration (FDA) has approved Journavx (suzetrigine), a first-in-class, non-opioid analgesic designed for the treatment of moderate to severe acute pain in adults. This approval represents a major step forward in addressing acute pain while offering an alternative to traditional opioid-based pain medications, which have long been associated with addiction risks and other serious side effects.

Acute pain is a short-term pain response to tissue injury caused by conditions such as trauma, surgery, or other medical procedures. While opioid medications have traditionally been a mainstay in the treatment of acute pain, their potential for opioid use disorder (OUD), misuse, and abuse has been a longstanding concern. The introduction of Journavx provides a novel approach to pain management, delivering effective relief without the risks associated with opioids.

A New Mechanism of Action: Targeting Pain at Its Source

Journavx represents an entirely new class of pain medications, working through a unique mechanism of action. Unlike opioids, which act on the brain's opioid receptors to dull pain perception, Journavx targets sodium channels in the peripheral nervous system before pain signals even reach the brain. By blocking these specific sodium channels, the drug disrupts the transmission of pain signals at their origin, leading to effective pain relief without the risk of opioid dependence.

FDA's Commitment to Non-Opioid Pain Management

The approval of Journavx aligns with the FDA's broader efforts to expand access to non-opioid treatment options while maintaining a careful balance between patient access and safety. The agency has been actively working to support the development of innovative pain management therapies that reduce reliance on opioids while ensuring that patients suffering from significant pain continue to have access to effective medications. "Developing effective, non-opioid pain treatments is an important step toward reducing opioid dependency while ensuring that patients still have access to necessary pain relief," an FDA spokesperson stated. "Journavx represents a new frontier in pain management, offering patients an alternative to opioids without compromising on efficacy."

The FDA's approval of Journavx was based on two large, randomized, double-blind, placebo- and active-controlled clinical trials that evaluated the drug's efficacy and safety in acute pain conditions. These studies focused on pain relief following two common surgical procedures: Abdominoplasty and Bunionectomy. In both studies, Journavx demonstrated a statistically significant reduction in pain levels compared to placebo, reinforcing its effectiveness as a powerful pain reliever for acute conditions. While Journavx provides an exciting new option for pain relief, it is important to be aware of its potential side effects and contraindications. Clinical trial participants who received Journavx experienced some adverse reactions, including: Itching, Muscle spasms, Elevated blood levels of creatine phosphokinase (a muscle enzyme), and Rash.

Additionally, Journavx is contraindicated for use with strong CYP3A inhibitors, as these medications can interfere with the drug's metabolism, potentially leading to adverse effects. Patients taking Journavx are also advised to avoid consuming grapefruit or grapefruit-containing products, as these can also impact the drug's effectiveness.

The approval of Journavx marks a significant milestone in the ongoing effort to provide effective pain management solutions while minimizing reliance on opioids. As a first-in-class medication, it paves the way for further innovation in non-opioid pain relief, addressing a critical need for safer and more effective pain treatment options.

PRODUCT UPDATES

1. Latest Update on Metformin – 2025 CDSCO Approval for Use in Pregnancy

Exciting news for the management of gestational diabetes mellitus (GDM)! The Central Drugs Standard Control Organization (CDSCO) has approved an important update regarding the use of Metformin Sustained Release tablets (500 mg/1000 mg). This approval now allows Metformin to be considered for use during pregnancy and in the periconceptional phase as an addition or alternative to insulin therapy, when clinically necessary.

This regulatory update marks a significant milestone in gestational diabetes care, providing doctors with more flexibility in managing blood glucose levels in pregnant women. With this change, healthcare professionals can now reduce dependence on insulin therapy where appropriate, offering a more patient-friendly approach to GDM treatment.

The latest prescribing information now states: "If clinically needed, the use of Metformin can be considered during pregnancy and in the periconceptional phase as an addition or an alternative to insulin based on treating physician discretion." By broadening treatment options beyond insulin, the update aims to enhance convenience, affordability, and compliance while maintaining optimal glycemic control during pregnancy.

The approval of Metformin for use in pregnancy is a landmark decision that could significantly impact maternal and fetal health outcomes. The benefits of Metformin in managing diabetes and related conditions have been well established, and now, its use in pregnancy offers several key advantages:

- Metformin is already widely used for treating Type 2 Diabetes, Prediabetes, and Polycystic Ovary Syndrome (PCOS). Its safety and efficacy in these conditions have been extensively studied and documented.
- Gestational Diabetes Management: In several countries, including the UK and the European Union (EU), Metformin is already recommended for GDM treatment, leading to a significant rise in its prescription for pregnant women.
- Safer Alternative to Insulin: Unlike insulin therapy, which may increase maternal weight gain, Metformin is associated with less maternal weight gain during pregnancy, while still maintaining effective blood sugar control.
- No Increased Risk of Congenital Abnormalities: Clinical studies and regulatory reviews have not shown an increased risk of congenital abnormalities associated with Metformin use in pregnancy, making it a safe and effective option when clinically indicated.
- Supported by International Guidelines: The UK's Medicines and Healthcare Products Regulatory Agency (MHRA) has already endorsed Metformin's safety in pregnancy, reinforcing confidence in its use for managing gestational diabetes.

With these advantages, the CDSCO's approval aligns India's diabetes care guidelines with global best practices, ensuring that pregnant women with GDM have access to safe, effective, and well-tolerated treatment options. The approval of Metformin for use in pregnancy and the periconceptional phase marks a major advancement in the management of gestational diabetes in India. By offering an alternative to insulin in select cases, this update enables more personalized and patient-friendly diabetes care.

2. Sotagliflozin Shows Promise in Reducing Cardiovascular Events in High-Risk Patients

A major international clinical trial led by a Mount Sinai researcher has revealed that sotagliflozin, a newly approved medication for type 2 diabetes and chronic kidney disease (CKD) with cardiovascular risk factors, can significantly lower the risk of heart attacks and strokes in these patients.

The study, published on February 14 in The Lancet Diabetes & Endocrinology, is the first to demonstrate that an SGLT inhibitor offers such distinct cardiovascular benefits, potentially expanding its role in preventing life threatening cardiovascular events worldwide.

Sotagliflozin belongs to the class of sodium-glucose cotransporter (SGLT) inhibitors, a group of drugs that have transformed diabetes and cardiovascular care. Unlike most SGLT inhibitors, which primarily block SGLT2, sotagliflozin uniquely inhibits both SGLT1 and SGLT2, resulting in enhanced glucose control and additional cardiovascular benefits.

SGLT2 inhibition – Prevents glucose reabsorption in the kidneys, lowering blood sugar and reducing the risk of kidney disease progression.

SGLT1 inhibition – Delays glucose absorption in the intestines, leading to better post-meal blood sugar control and potential heart benefits.

Because of this dual mechanism of action, sotagliflozin may provide stronger cardiovascular protection compared to traditional SGLT2 inhibitors. The study, which enrolled patients with type 2 diabetes, CKD, and elevated cardiovascular risk, showed that sotagliflozin significantly reduced major adverse cardiovascular events (MACE), including: lower risk of heart attacks, reduced incidence of strokes and improved overall cardiovascular outcomes.

These results provide compelling evidence for the wider adoption of sotagliflozin, not only in diabetes management but also as a key intervention for reducing cardiovascular risks in high-risk populations.

3. Tirzepatide reduces albuminuria among adults with type 2 diabetes in SURPASS trials

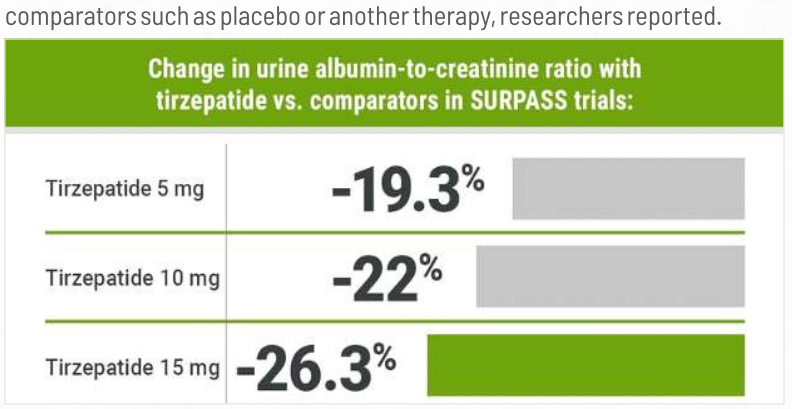
A recent post hoc analysis of the SURPASS clinical trials, published in Diabetes Care, has shown that tirzepatide (Mounjaro, Eli Lilly) leads to a significant reduction in urine albumin-to-creatinine ratio (UACR) among adults with type 2 diabetes. This reduction was even more pronounced in individuals with chronic kidney disease (CKD) at baseline, suggesting potential renal benefits beyond glycemic control.

The study, led by Hiddo J. L. Heerspink, PhD, a professor and clinical pharmacologist at the University Medical Center Groningen in the Netherlands, highlights the therapeutic promise of tirzepatide in slowing kidney function decline and reducing the risk of kidney failure in patients with diabetes.

Key takeaways

- Adults receiving tirzepatide in the SURPASS trials had significant decreases in urine albumin-to-creatinine ratio.
- Those with CKD receiving tirzepatide had larger urine albumin-to-creatinine ratio reductions.

Adults with type 2 diabetes receiving tirzepatide had significantly greater declines in urine albumin-to-creatinine ratio than those receiving comparators such as placebo or another therapy, researchers reported.



"Tirzepatide will likely slow the decline in kidney function and reduce the risk of kidney failure in patients with type 2 diabetes," Heerspink told Healio. "Previous large meta-analyses have demonstrated that therapies reducing urinary albumin-to-creatinine ratio by at least 25% are highly likely to confer clinical benefit. The achieved reductions with tirzepatide, in particular in patients with higher baseline urinary albumin-to-creatinine ratio, indicate that a 25% reduction can be achieved."

Researchers collected data from the five SURPASS trials, which assessed the effects of tirzepatide among people with type 2 diabetes. Tirzepatide was compared with placebo in SURPASS-1 and SURPASS-5, once-weekly semaglutide 1 mg (Ozempic, Novo Nordisk) in SURPASS-2, daily insulin degludec (Tresiba, Novo Nordisk) in SURPASS-3 and titrated insulin glargine (Lantus, Sanofi) in SURPASS-4. Percent change in urine albumin-to-creatinine ratio was collected from baseline to 40 weeks for all trials except SURPASS-4, in which the final measure was collected at 42 weeks.

Tirzepatide Shows Dose-Dependent Albuminuria Reduction

Participants receiving tirzepatide had greater declines in UACR than those in the comparator groups (Tirzepatide: 5 mg – 19.3%, 10 mg – 22%, 15 mg – 26.3%). The most substantial differences in UACR reduction were observed in trials comparing tirzepatide with a placebo.

Reductions in urine albumin-to-creatinine ratio with tirzepatide were larger for adults with CKD. Among adults with a urine albumin-to-creatinine ratio of 30 mg/g or higher at baseline, those receiving tirzepatide 5 mg had a 31.3% greater urine albumin-to-creatinine ratio reduction, the tirzepatide 10 mg group had a 42.2% larger decline and the tirzepatide 15 mg group had a 47.3% greater decrease than adults in the pooled comparator group.

Of adults with an estimated glomerular filtration rate of less than 60 mL/min/1.73 m2, those receiving tirzepatide 5 mg had a 26.6% greater urine albumin-to-creatinine ratio decrease, the 10 mg tirzepatide group had a 23.6% greater decline and adults receiving tirzepatide 15 mg had a 49.2% larger reduction than the comparator group.

Researchers found tirzepatide reduced urine albumin-to-creatinine ratio through direct and indirect means. Reductions in HbA1c and body weight induced by tirzepatide mediated 45.9% of the decline in urine albumin-to-creatinine ratio, with the remaining 54.1% of the decrease being explained by the direct effects of the tirzepatide doses and other variables.

"[The mediation analysis] suggests that other direct effects of tirzepatide on the leakage of albumin through the glomeruli are involved as well," Heerspink said. "This could be direct effects on the glycocalyx/endothelial function or potential anti-inflammatory effects."

Heerspink noted most adults enrolled in the SURPASS trials had preserved kidney function, and additional studies enrolling adults with type 2 diabetes plus CKD with longer follow-ups are needed.

Reference: Ellen M. Apperloo, Katherine R. Tuttle, et. al., Diabetes Care 20 February 2025; 48(3): 430–436.

4. Vonoprazan for PPI-Refractory Functional Dyspepsia among Asian Patients: A Game Changer?

Background & Importance of Study

Functional dyspepsia (FD) is a widespread gastrointestinal disorder, affecting up to 30% of the global adult population. Although not life-threatening, FD symptoms-such as persistent stomach discomfort, bloating, early satiety, and acid reflux-can significantly impact quality of life and increase healthcare costs. International guidelines recommend proton pump inhibitors (PPIs) as the first-line treatment due to their acid-reducing effects. However, a considerable number of patients fail to respond to PPIs, leaving them without effective symptom relief.

Vonoprazan, a potassium-competitive acid blocker (P-CAB), offers a novel treatment approach by providing stronger and more sustained acid suppression than PPIs. Unlike PPIs, vonoprazan is not affected by CYP2C19 polymorphisms, ensuring consistent efficacy across different patient populations. While vonoprazan has proven effective for conditions such as erosive esophagitis and Helicobacter pylori eradication, its role in treating PPI-refractory FD remains underexplored.

To address this gap, a double-blinded, randomized controlled trial was conducted to compare the efficacy of vonoprazan 10 mg and 20 mg in patients with FD who had not responded to standard PPI therapy.

Study Design & Methodology

The study was conducted at Rajavithi Hospital, Bangkok, Thailand, between December 2022 and December 2023. A total of 60 patients were enrolled based on the ROME IV criteria for FD diagnosis. Participants had moderate FD symptoms (Global Overall Symptoms Scale GOSS > 21) and had failed at least four weeks of standard-dose PPI therapy.

Patients were randomly assigned to receive either 10 mg or 20 mg vonoprazan daily for four weeks. A follow-up period of four additional weeks post-treatment assessed the sustainability of symptom relief.

Primary Outcome

- Symptom improvement measured by the Global Overall Symptoms Scale (GOSS).

Secondary Outcomes

- Quality of life improvement assessed using the Nepean Dyspepsia Index.
- Dyspepsia response rate, defined as at least a 50% improvement in GOSS scores.
- Safety profile and adverse event monitor.

Key Findings & Results

1. Rapid and Sustained Symptom Relief

Both 10 mg and 20 mg vonoprazan significantly reduced dyspepsia symptoms, with noticeable improvements as early as week 2. By week 4, symptoms had decreased by over 60%, and this relief was largely maintained during the four-week post-treatment follow-up.

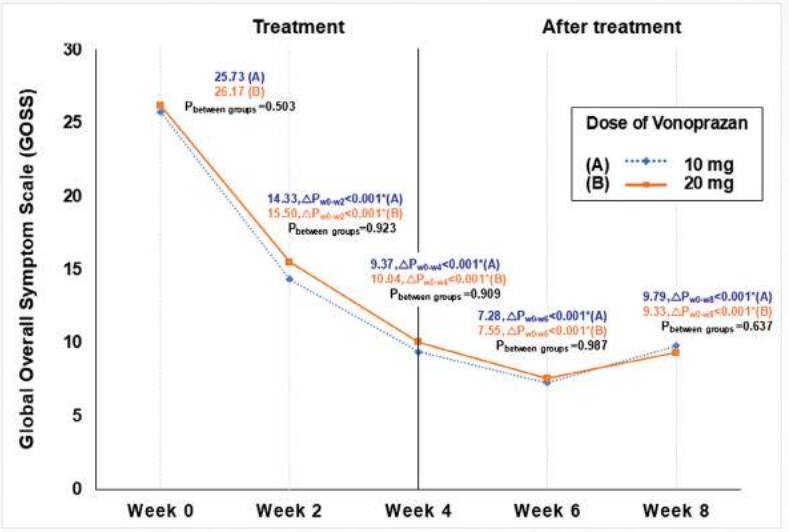


Fig 1. Changes in Global Overall Symptom Scale (GOSS). The graph shows symptom improvement by GOSS scale with vonoprazan 10mg and 20mg.

2. Improved Quality of Life

Patients in both dosage groups reported significant improvements in daily activities, eating habits, and emotional well-being, as measured by the Nepean Dyspepsia Index.

3. High Response Rates

By week 4, approximately 75-80% of patients achieved a clinically significant symptom improvement of ≥50%. These benefits persisted for at least one month after stopping treatment.

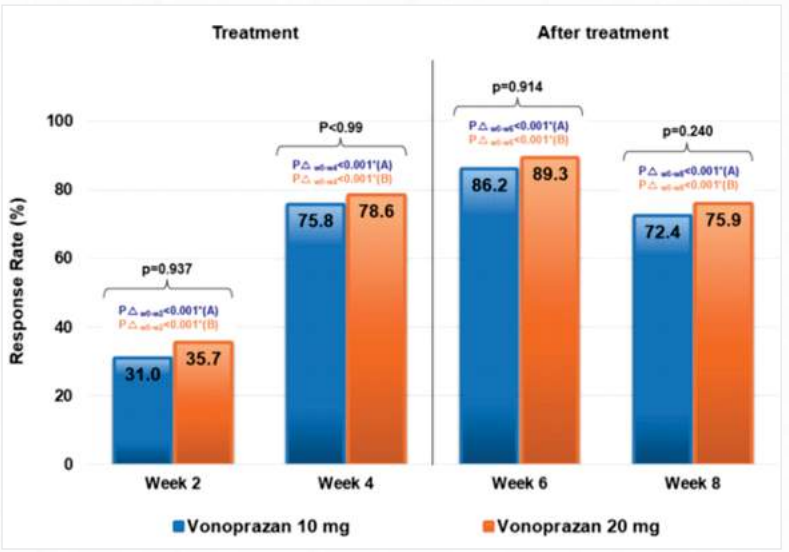


Fig. 2 Dyspepsia Response Rate (defined as greater than 50% improvement in Global Overall Symptom Scale from baseline).

4. No Significant Difference Between 10 mg and 20 mg Doses

Interestingly, both doses provided similar symptom relief, suggesting that 10 mg vonoprazan is just as effective as 20 mg for managing PPI-refractory FD. Clinical Implication: Since 10 mg was just as effective as 20 mg, lower doses may be preferable for initial treatment to minimize drug exposure and costs.

5. Safety & Adverse Events

Vonoprazan was well tolerated, with no serious adverse events reported. The most common mild side effects were:

- Bloating(6.7%)
- Nausea(5%)
- Constipation(3.3%)

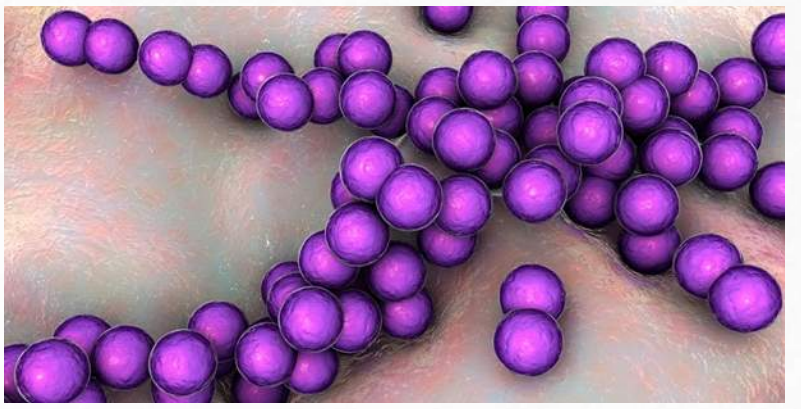
Clinical Impact & Future Implications

- Stronger acid suppression by vonoprazan offers rapid and sustained symptom relief, making it a promising alternative for patients who do not respond to PPIs.
- 10 mg vonoprazan is sufficient for symptom control, providing an effective and cost-efficient option.
- Extended follow-up studies are needed to assess long-term efficacy and safety, particularly regarding acid rebound effects.

Reference: Bunchorntavakul C, Jaigla P. Efficacy of Vonoprazan 10mg and 20mg for Patients With Proton Pump Inhibitor-Refractory Functional Dyspepsia: A Double-Blinded, Randomized Study. JGH Open. 2024 Dec 20;8(12):e70082.

GUT-DERIVED SUGARS: A POTENTIAL GAME-CHANGER FOR WEIGHT MANAGEMENT AND DIABETES

Scientists uncover how gut bacteria's sugar-derived compounds influence metabolism, offering potential for new probiotic therapies.



Background: The Gut's Role in Metabolism

Metabolic disorders like obesity and diabetes continue to rise worldwide, prompting researchers to explore beyond diet and exercise for new regulatory mechanisms. The gut microbiota-a diverse ecosystem of trillions of microorganisms-plays a crucial role in metabolism, immunity, and overall health. Among these microbes, certain bacteria produce exopolysaccharides (EPS), sugar-derived compounds that influence metabolic processes.

Recent studies suggest EPS can modulate immune responses, enhance gut barrier function, and interact with metabolic pathways. However, the precise mechanisms of how microbial EPS impacts metabolic health remain unclear. A groundbreaking study published in Nature Communications sheds new light on this connection by exploring how gut-derived EPS influences blood sugar levels, fat accumulation, and metabolic regulation.

Study Overview: EPS, Gut Microbiota, and Metabolic Health

Researchers investigated the effects of EPS-producing gut bacteria, particularly Streptococcus salivarius, on glucose metabolism and obesity-related markers. This study combined human gut microbiota analysis with controlled mouse experiments to determine how EPS influences host metabolism.

- Key microbial discovery: S. salivarius was identified as a dominant EPS-producing strain in the human gut, producing EPS exclusively from sucrose, not glucose or fructose.
- Human data: Fecal samples from 472 individuals were analyzed, revealing a correlation between higher S. salivarius abundance and improved insulin sensitivity and lower blood glucose levels.
- Mouse experiments: Mice were given EPS supplements and monitored under standard and high-fat diets. Researchers assessed glucose tolerance, insulin sensitivity, gut microbiota composition, and metabolic markers.

Key Findings & Metabolic Benefits of EPS

1. EPS Enhanced Glucose Metabolism

Mice receiving EPS showed significant improvements in glucose tolerance and insulin sensitivity. Germ-free mice colonized with S. salivarius had higher glucagon-like peptide-1(GLP-1) levels, a gut hormone essential for blood sugar regulation.

2. EPS Reduced Fat Mass & Controlled Weight Gain

EPS-fed mice had lower body weight and fat accumulation compared to controls, even under a high-fat diet. Long-term monitoring confirmed sustained metabolic improvements over 16 weeks.

3. EPS Altered Gut Microbiota Composition

Metagenomic sequencing revealed EPS increased the abundance of short-chain fatty acid (SCFA)-producing bacteria, such as Bacteroides and the Bacteroidales S24-7 group. SCFA analysis showed higher acetate and propionate levels, supporting enhanced microbial fermentation and energy metabolism.

4. EPS Reduced Inflammation Linked to Obesity & Diabetes

Inflammatory markers, including pro-inflammatory cytokines, were significantly lower in EPS-treated mice. This suggests that gut-derived EPS may protect against chronic metabolic inflammation, a key driver of insulin resistance.

5. EPS Regulated Appetite & Energy Balance

EPS-fed mice ate less food, despite having similar energy expenditure as controls. Elevated GLP-1 and peptide YY (PYY) levels suggest that EPS may enhance satiety, potentially reducing overeating and promoting weight control.

Clinical Implications: Can Gut Bacteria Prevent Metabolic Disorders?

This study highlights the potential of microbiota-targeted therapies for weight management and diabetes prevention. With increasing evidence that gut bacteria-derived EPS influences metabolism, researchers are now exploring probiotic and prebiotic approaches to enhance metabolic health.

Key Takeaways

- Gut-derived EPS from S. salivarius improves glucose metabolism and reduces fat accumulation.
- SCFA production plays a crucial role in mediating metabolic benefits.
- EPS supplementation may offer a novel probiotic-based strategy for preventing metabolic diseases.

While these findings are promising, further research is needed to evaluate strain-specific effects, dietary interactions, and long-term human applications. Could microbiome-based interventions become a new frontier in metabolic disease management? The potential is exciting, and future studies will determine how gut-derived EPS can be harnessed for therapeutic use.

Reference: Shimizu, H., Miyamoto, J., Hisa, K. et al. Sucrose-preferring gut microbes prevent host obesity by producing exopolysaccharides. Nature Communications (2025). DOI: 10.1038/s41467-025-56470-0

CASE STUDY - 1

Mitral Valve Aneurysms Complicating Aortic Valve Endocarditis: A Case Series

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Background

Mitral valve aneurysms are rare and occur most commonly in association with aortic valve endocarditis. Transoesophageal echocardiography is the most sensitive imaging modality for the diagnosis of this entity and its potential complications, such as leaflet rupture and acute severe mitral regurgitation, which mandate prompt surgical intervention, however, the optimal treatment for MVAs, and in particular, the timing of surgery, is not well defined.

We present a case series of 3 patients with mitral valve aneurysm associated with aortic regurgitation. Out of the three, two cases were infective endocarditis of the aortic valve. We present a case series of 3 patients of AV endocarditis with associated aortic regurgitation (AR), initially managed with antibiotic therapy, but complicated by the occurrence of MVA and MR. We hypothesized that the aneurysm developed through direct extension of infection from the aortic valve or from a prolapsing aortic vegetation. Therefore, they underwent Aortic valve (AV) replacement with MV replacement/repair.

Case Series

CASE -1

A fifty-six-year-old male patient was diagnosed to have culture-negative infective Endocarditis of the aortic valve from outside the hospital while being evaluated for fever. While on domiciliary treatment with a broad-spectrum antibiotic (elsewhere) patient developed acute dyspnea and hence presented to our emergency room with pulmonary oedema. Although the repeated blood cultures were negative, he had leukocytosis, elevated CRP and NT Pro- BNP (549.1pg/ml).

After initial treatment of heart failure, he underwent a TEE Test, which revealed a bicuspid aortic valve with a large vegetation protruding in the left ventricular outflow tract (LVOT) in diastole (Image-1). There was flap dissection of an anterior mitral leaflet with a perforation about 5 mm from the aortamitral junction (Image-2). Color Doppler evaluation showed the regurgitant mitral jet entering the mitral valve aneurysm and filling the left atrium through a rent. Subsequently, after one week of antibiotics patient underwent replacement of the aortic and also mitral valve as the later was beyond repair due to the damage incurred. The patient was discharged from the hospital with normally functioning valves but 2 months later was brought to the ER in an unconscious state after a fall at home and succumbed to death in four days.

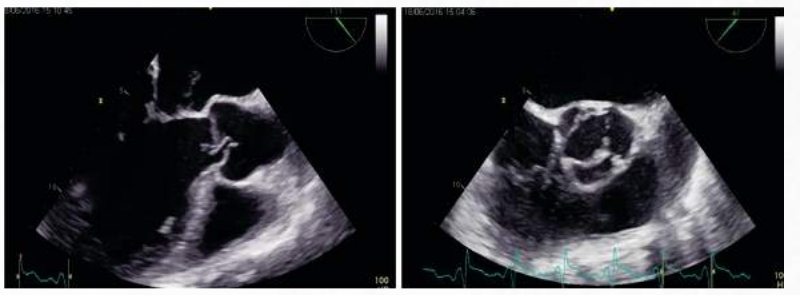

Image 1: Bicuspid aortic valve with vegetation over NCC

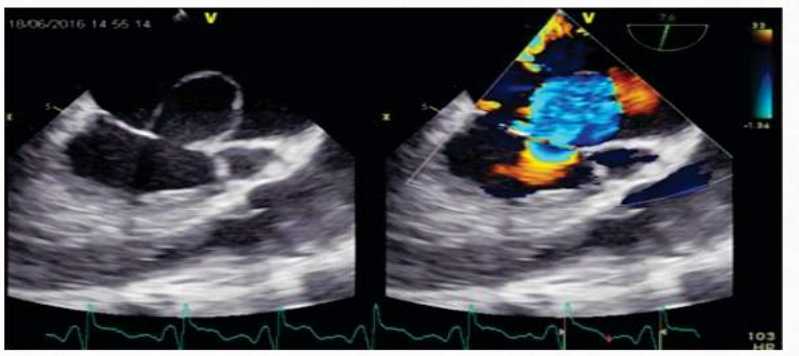

Image 2: Dissection of AML with severe eccentric MR with aneurysm attached to AML

CASE-2

This 33-year-old lady had a lower segment caesarean section, following which febrile illness was treated conservatively. Five months later, she presented with a sudden onset amnesia and was found to have right hemiparesis. Imaging was suggestive of multiple cerebral infarcts. A cardiac evaluation revealed a tri-leaflet aortic valve with multiple vegetations, moderate aortic regurgitation, mild mitral regurgitation, and mild pulmonary arterial hypertension. A culture-negative endocarditis diagnosis was made, and she was advised to take antibiotics thereafter for 6 weeks. Towards the end of the antibiotic course, she developed heart failure requiring admission to another hospital and was found to have worsening aortic regurgitation with large vegetations on aortic leaflets, with moderate mitral valve insufficiency. Her valve replacement was postponed due to the COVID pandemic for about 10 months, and she had one more admission elsewhere for heart failure.

She was admitted for her valve surgery and clinical features suggestive of a volume overload state. Trans thoracic Echo showed vegetations attached to the aortic valve with severe AR, severe MR with suspicious anterior mitral valve aneurysm (Image-3). During the pre-operative work, TEE was done to assess the valvular involvement. This revealed large vegetations attached to all three cusps of the aortic valve (Image-5), which prolapsed to LVOT during diastole with severe AR (Image-4). Mitral valve showed mild thickening with an aneurysm 1 cm x 1 cm attached towards the medial commissure. Severe MR jet spilling the left atrium through the aneurysm (Image-3).

Subsequently, she underwent double valve replacement with a mechanical prosthetic valve and was discharged (Image-6). Six months later, at follow up she was asymptomatic with normally functioning prosthetic valves.

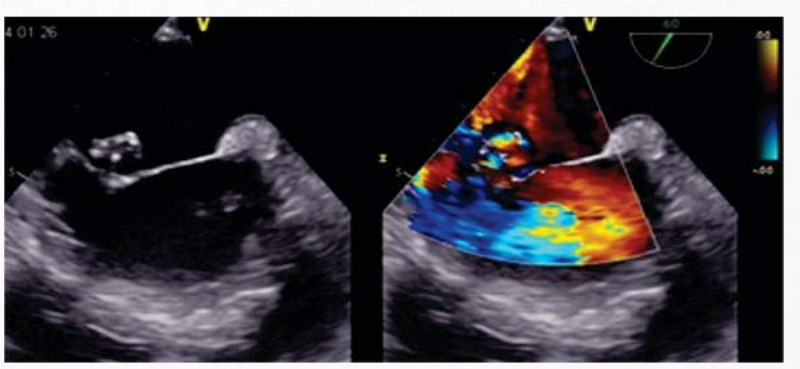

Image 3: Perforation of AML with an aneurysm attached to AML

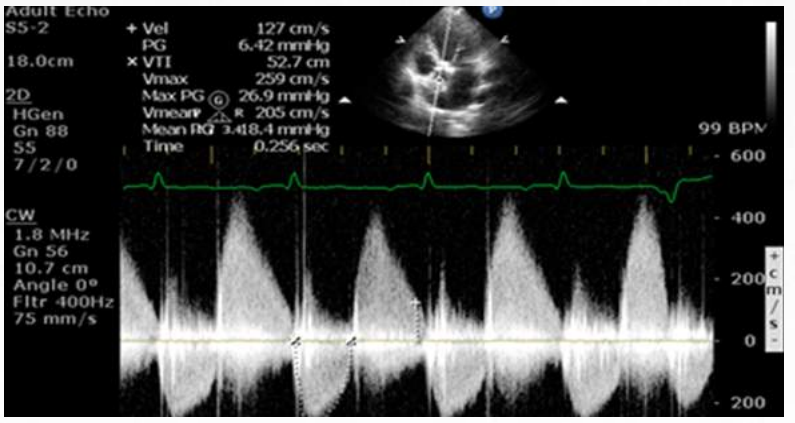

Image 4: Severe AR with triangular JET and PHT 89 MSEC

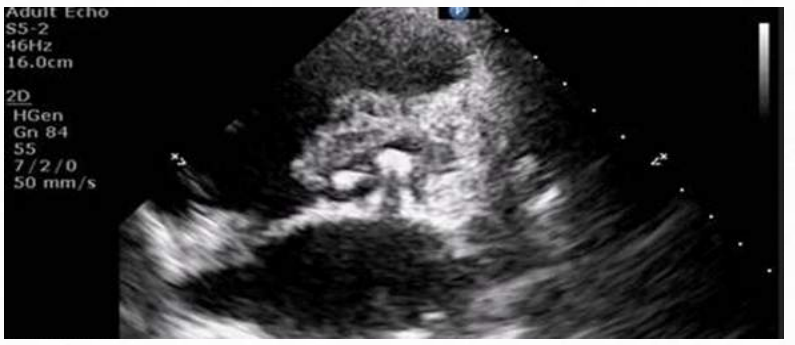

Image 5: Large vegetations attached to all 3 cusps of aortic valve prolapsing into LVOT during diastole

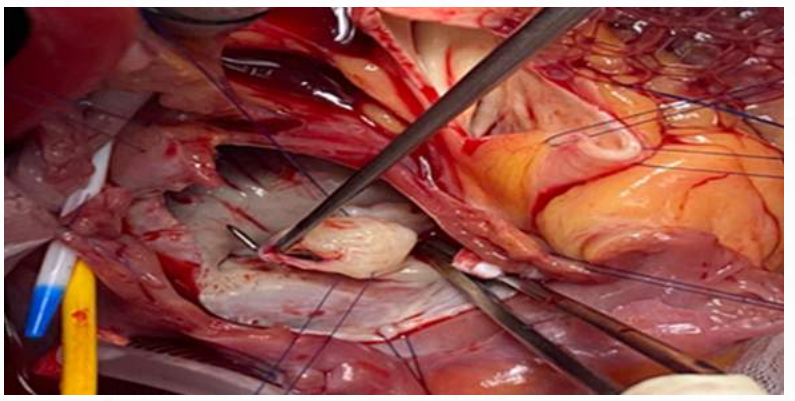

Image 6: Primary Surgery: DVR - AV - #17 SJM Regent MV - #23 TTK Chitra

CASE-3

The third case was a 41-year-old gentleman with multiple issues -Type II Diabetes Mellitus, Systemic Hypertension, Coronary Artery Disease with PCI, Chronic Renal Failure on Renal Replacement Therapy and Post COVID infection. He was found to have Aortic regurgitation during his pre-operative workup for renal transplant. Trans thoracic echo suggestive of a torn right coronary cusp with severe AR (Image-8), (Image-9) and an aneurysm of AML (Image-7) with severe MR. Infective endocarditis was considered as the etiology, but the workup, including blood cultures, was negative.

The patient underwent elective aortic valve replacement (23 mm St Jude regent valve) and AML perforation closure with a fresh pericardial patch. The post-operative period was uneventful.

Image 7: AML aneurysm with perforation; secondary to endocarditis causing severe MR.

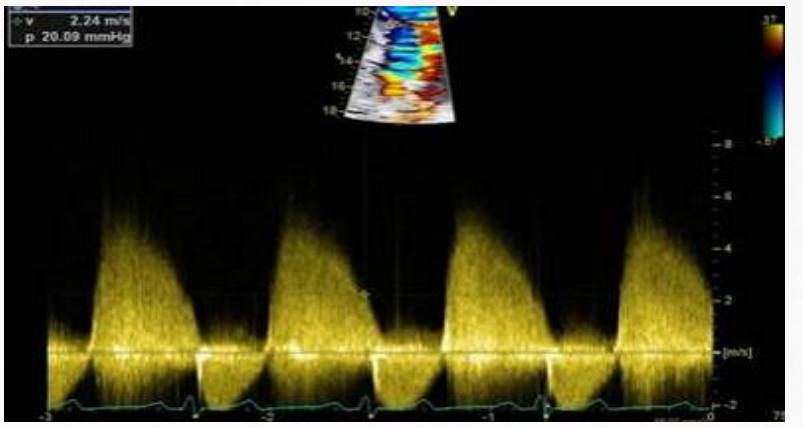

Image 8: AR PHT=210ms

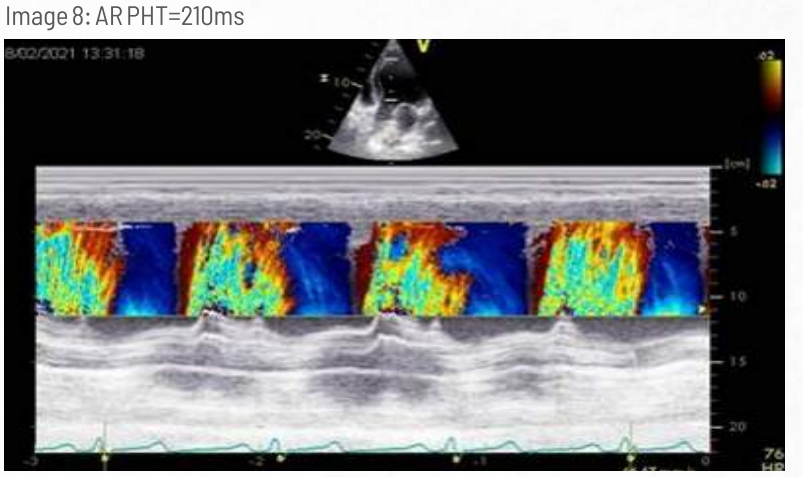

Image 9: Severe AR with diastolic flow in m mode

Discussion

Mitral valve aneurysm (MVA) was first described in 1729 as a saccular structure bulging into the left atrium with systolic expansion and diastolic collapse. MVAs are rare, seen in 0.2%–0.3% of echocardiographic exams. Various causes include connective-tissue disorders, pseudoxanthoma elasticum, and myxomatous degeneration, but infective endocarditis (IE) is the most common. In our series, two of three cases were due to IE. The probable mechanism involves aortic valve destruction producing a regurgitant jet that strikes the anterior mitral leaflet, leading to secondary infection and aneurysm formation. Perforation of these aneurysms causes mitral regurgitation and pulmonary edema from volume overload caused by aortic regurgitation.

In many aortic valve endocarditis cases, infection spreads to the mitral-aortic intervalvular fibrosa. Large aortic vegetations prolapsing into the left ventricular outflow tract during diastole can contact the anterior mitral leaflet, causing secondary infection, abscess, aneurysm, and perforation. Aneurysm rupture occurred in 72% of reported cases; all three aneurysms in our series were ruptured with significant mitral regurgitation. Larger aneurysm size does not necessarily increase rupture risk. Rupture may also increase the risk of peripheral embolization.

Clinical presentation varies, reflecting valvular complications and IE. One patient presented with acute pulmonary edema likely due to sudden volume overload from aneurysm rupture; another had a cerebrovascular accident possibly from embolization; the third case was asymptomatic and incidentally detected. Transthoracic echocardiography (TTE) may identify subtle abnormalities, but TEE provides better resolution and definitive identification. MVA can mimic myxomatous degeneration, mitral valve prolapse, flail leaflet, papillary fibroelastoma, myxomas, and non-endothelial cysts. Color Doppler confirms communication between aneurysm and left ventricle. In our cases, TTE identified aneurysms and causes of mitral regurgitation in two cases. TTE sensitivity for vegetation detection is 60–75%, while TEE sensitivity exceeds 95%. TEE clearly delineates perforation site, aneurysm size, mitral valve anomalies, and regurgitant jet entry site.

Valves exposed to high-pressure flow, like left heart valves, are more susceptible to injury in IE. Early detection and intervention prevent complications such as rupture, embolism, and worsening endocarditis. MVAs can cause severe mitral regurgitation by perforation or mass effect on leaflet coaptation, leading to rapid hemodynamic deterioration. In our series, two patients experienced pulmonary edema and stroke due to aneurysm rupture; one underwent elective surgery.

Most reported IE cases with MVA require surgery, though timing varies. Some suggest early surgery upon aneurysm detection to prevent rupture, mitral regurgitation, and embolization. Others recommend conservative management unless cardiac deterioration occurs. Small abscesses or false aneurysms without other surgical indications may be managed conservatively with antibiotics and close follow-up. Uncontrolled local infection generally indicates early surgery. In complicated aortic valve IE, surgeons should evaluate for extra-valvular involvement, especially the aortic root and mitral-aortic intervalvular fibrosa. Given the extent of abnormalities, mitral valve replacement is often necessary, but repair is preferred when feasible due to lower recurrent IE risk. In our series, one patient underwent mitral valve repair with less severe involvement and no IE, while the others required replacement. Valve repair or replacement should be considered during aortic valve surgery in patients with MVA.

Conclusion

MVAs are infrequent but potentially severe complications of AV endocarditis. They may occur as a consequence, either of direct extension of infection to the MV or of significant AR with an eccentric jet directed toward the AML. Severe MR or embolization are possible consequences of MVAs that may worsen the clinical course and the hemodynamic stability of the patient. Given the uncertainty about the optimal treatment of IE with this specific complication, the correct timing of surgery in MVA should depend on concomitant clinical and infective features.

CASE STUDY - 2

IVUS Guided PCI to Ostial LM

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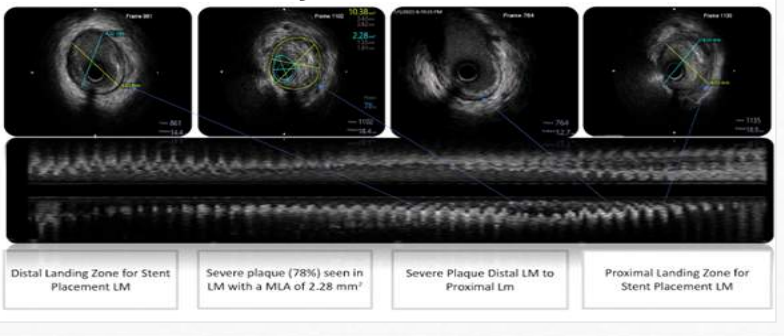
Introduction

Percutaneous Coronary Intervention (PCI) guided by Intravascular Ultrasound (IVUS) has revolutionized the management of complex coronary artery lesions, particularly in the Left Main Coronary Artery (LMCA). IVUS provides detailed visualization of plaque morphology, lumen size, and lesion distribution, enabling accurate stent sizing and placement. This case study illustrates the clinical utility of IVUS-guided PCI in treating ostial LM stenosis, highlighting its role in optimizing procedural outcomes and enhancing patient safety. The case involves a 43-year-old male who presented with Grade 3 angina and was managed by Dr. Vikas Agarwal, Senior Interventional Cardiologist at Surya Super Specialty Hospital, Varanasi.

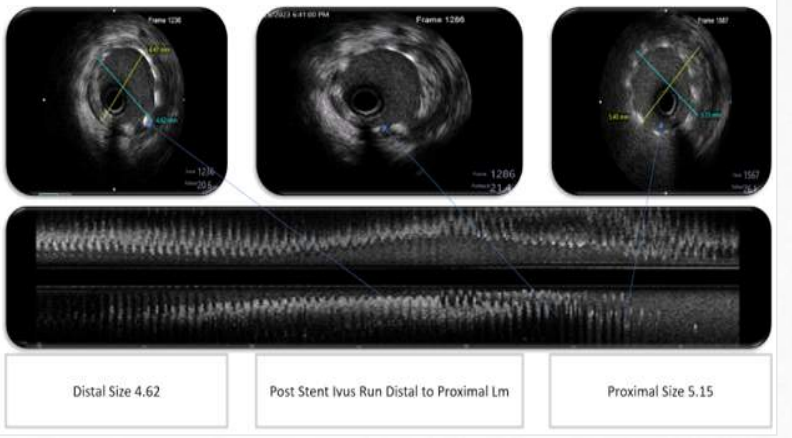
Case Presentation

A 43-year-old male was admitted with Grade 3 angina persisting for six months. He had a medical history of hypertension and dyslipidemia and was working in the Gulf region. An angiogram conducted outside the country initially reported 20% coronary disease (CD) in the ostial LM. However, upon reevaluation in Dr. Agarwal's clinic, the stenosis was assessed to be more than 70%. Despite the severity suggested by the angiogram review, the patient's ECG and 2D Echo were normal. Given the discrepancy between clinical presentation and non-invasive findings, a decision was made to perform a PCI to the LM guided by IVUS to ensure accurate assessment and optimal stent placement.

Pre Stenting Evaluation with IVUS in LM



Post Stenting Evaluation with IVUS in LM



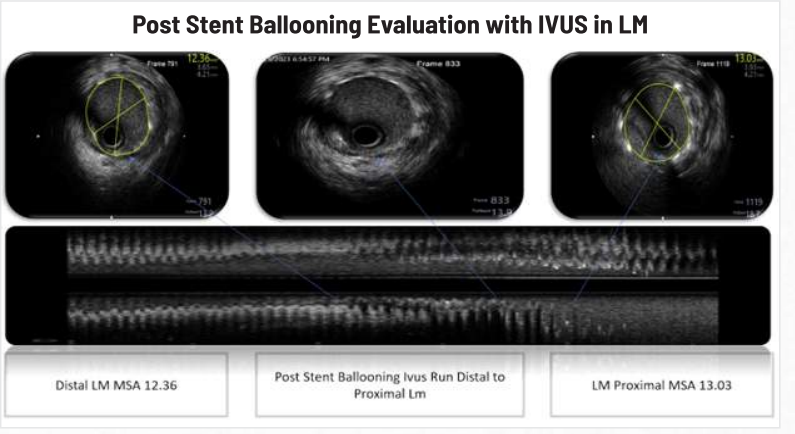
Investigations and Pre-Procedure Findings

Coronary Angiography (CAG) revealed significant stenosis of approximately 80% from the proximal to the shaft of the LM, whereas other coronary arteries were normal. The lesion was engaged using an LCS catheter (3.5/7 XB). IVUS imaging was performed, which showed severe plaque burden (78%) in the LM with a minimal lumen area (MLA) of 2.28 mm^2. This confirmed the need for intervention, and IVUS further helped in determining the distal and proximal landing zones for optimal stent placement.

Procedure Details

A BMW wire was advanced across the LM to the Left Anterior Descending (LAD) artery and parked distally. Pre-dilatation was performed using a 2.50 x 08 NC balloon inflated to 12-14 atm to prepare the lesion site. Subsequently, a 4.00 x 08 mm stent was deployed from the distal to the proximal LM. Post-stent IVUS imaging confirmed adequate stent expansion and apposition, with a distal LM size of 4.62 mm and a proximal LM size of 5.15 mm. The minimum stent area (MSA) was recorded as 12.36 mm^2 distally and 13.03 mm^2 proximally, demonstrating effective plaque compression and lumen gain. Post-stent ballooning was conducted using a 5.00 x 08 mm balloon at 12 atm for further optimization.

Post Stent Ballooning Evaluation with IVUS in LM



Outcome and Follow-Up

Post-procedure IVUS confirmed the successful expansion and apposition of the stent, with significant improvement in lumen area and no evidence of complications. The patient exhibited marked relief from angina symptoms and had an uneventful recovery. The procedure showcased the enhanced diagnostic accuracy and therapeutic precision offered by IVUS-guided PCI, particularly for complex LM lesions.

Discussion

This case highlights the clinical value of IVUS in guiding PCI for ostial LM stenosis. Conventional angiography tends to underestimate the severity of LM lesions, especially at the ostium, due to foreshortening and overlapping branches. IVUS overcomes these limitations by providing precise imaging of lumen dimensions, plaque characteristics, and lesion morphology. This enables accurate stent sizing and positioning, minimizing the risks of stent under-expansion, malapposition, or restenosis. In this case, IVUS facilitated optimal stent deployment with significant plaque compression and improved lumen gain, leading to symptomatic relief and a favourable clinical outcome.

The decision to utilize IVUS was particularly crucial given the disparity between the initial angiogram report from another center (indicating 20% stenosis) and the more severe stenosis observed on reassessment. The case illustrates the importance of IVUS in guiding treatment decisions and ensuring procedural accuracy. Additionally, the imaging insights provided by

IVUS helped in identifying the optimal landing zones and assessing post-stent apposition, which are critical for long-term stent patency and patient outcomes.

This case demonstrates the effectiveness of IVUS-guided PCI in managing complex ostial LM stenosis, ensuring accurate lesion assessment, optimal stent placement, and improved procedural outcomes. The use of IVUS enabled precise imaging of plaque distribution, optimal stent sizing, and effective post-stent evaluation, reducing the likelihood of complications. This case underscores the growing importance of IVUS in contemporary interventional cardiology practice, particularly for challenging LM lesions where angiographic evaluation alone may be insufficient.

Clinical Implications and Take-Home Message

IVUS provides a more reliable assessment of lesion severity, plaque morphology, and lumen size compared to angiography, particularly in LMCA interventions. It enhances procedural precision by guiding optimal stent selection and deployment, thereby reducing adverse outcomes. This case supports the growing advocacy for routine IVUS use in complex coronary interventions, particularly in high-risk LM lesions. The take-home message is clear: **"Why take a chance? Choose imaging."**

CASE STUDY - 3

Alcohol Septal Ablation in a Post-Myectomy Patient: A Case Study

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Abstract

Hypertrophic cardiomyopathy (HCM) is a progressive cardiac disorder characterized by left ventricular hypertrophy and dynamic outflow tract obstruction. Surgical septal myectomy is the standard intervention for symptomatic obstructive HCM; however, some patients may require additional treatment. This case report presents a 31-year-old male with persistent left ventricular outflow tract obstruction (LVOTO) post-myectomy, who underwent alcohol septal ablation (ASA) as a secondary intervention. The study highlights the challenges in managing residual obstruction post-surgery, procedural complexities of ASA after myomectomy, and clinical outcomes.

Introduction HCM is a genetic disorder that causes left ventricular hypertrophy, leading to dynamic LVOTO and diastolic dysfunction. In symptomatic patients, first-line management includes beta-blockers and calcium channel blockers, with septal myectomy recommended for those with persistent obstruction. However, some cases may require further intervention, such as ASA, to alleviate symptoms and reduce obstruction. ASA is an alternative to repeat surgery but carries risks, particularly in post-myectomy patients. This report discusses the challenges, procedural intricacies, and outcomes of ASA in a post-myectomy patient.

Case Presentation

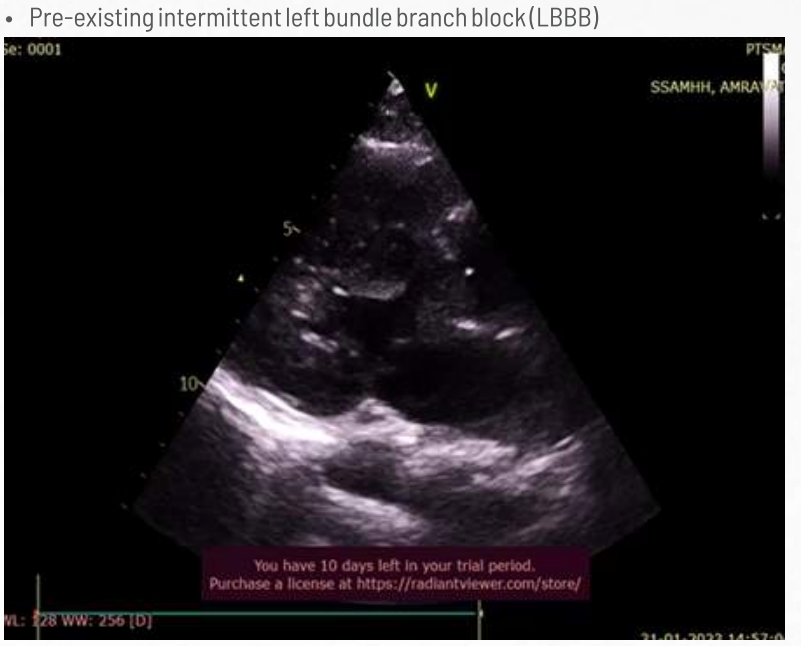
A 31-year-old male vegetable vendor presented with progressively worsening exertional dyspnea over three months. He had a history of obstructive HCM and underwent surgical septal myectomy six months prior. Despite initial symptom relief, he developed significant dyspnea (New York Heart Association (NYHA) Class III) with reduced exercise tolerance. There were no reported syncopal episodes, palpitations, or chest pain. The patient's medical history was otherwise unremarkable, and he was compliant with prescribed medications, including beta-blockers.

Examination, Investigation, and Diagnosis

On physical examination, the patient was hemodynamically stable with no significant hypotension or arrhythmias. A systolic ejection murmur was noted on auscultation.

Echocardiographic Findings

- Residual resting LVOTO: 69 mmHg
- Grade II diastolic dysfunction
- Mild pulmonary arterial hypertension (PAH)
- Pre-existing intermittent left bundle branch block (LBBB)



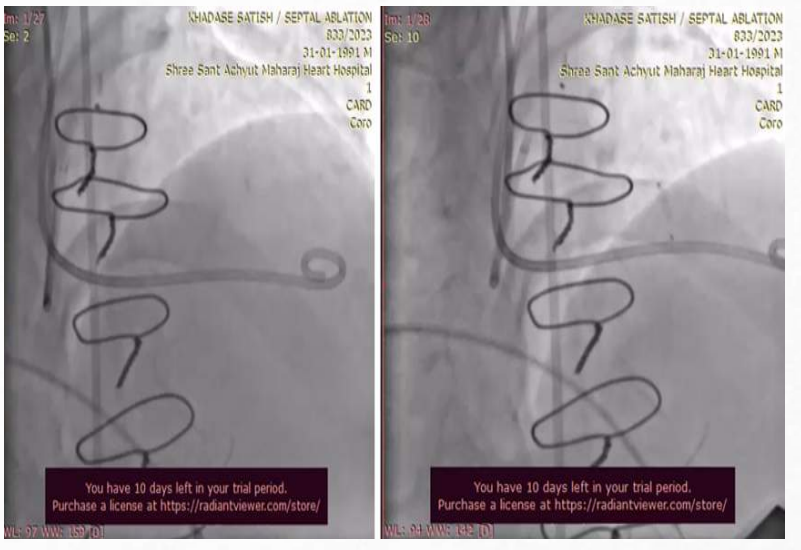
The findings confirmed persistent LVOTO despite prior myectomy, indicating the need for further intervention. Given the patient's progressive symptoms and high surgical risk for repeat myectomy, ASA was considered the most viable option.

Treatment and Management Procedural Plan

The primary goal was to reduce septal thickness and alleviate obstruction using ASA. The potential risks included ventricular septal rupture (VSR) and complete heart block (CHB), necessitating careful procedural planning.

Alcohol Septal Ablation Technique

1. Selective catheterization of the septal perforator artery supplying the hypertrophied segment.
2. Identification of the appropriate septal branch via contrast echocardiography.
3. Inflation of an over-the-wire (OTW) balloon to occlude the target septal artery.



4. Infusion of absolute alcohol to induce localized myocardial infarction, leading to septal remodeling.

Challenges Faced During the Procedure

- Finding the optimal OTW balloon for septal branch occlusion.
- Risk of iatrogenic VSD due to prior surgical intervention.
- Managing pre-existing intermittent LBBB to avoid CHB.

The procedure was performed successfully, achieving effective infarction of the target septal segment without immediate complications.

Follow-Up and Outcome

Post-procedure monitoring showed a significant reduction in LVOTO gradient.

Before ASA

- NYHA Class III
- Peak LVOTO: 69 mmHg

After ASA

- NYHA Class I
- Peak LVOTO: 25 mmHg

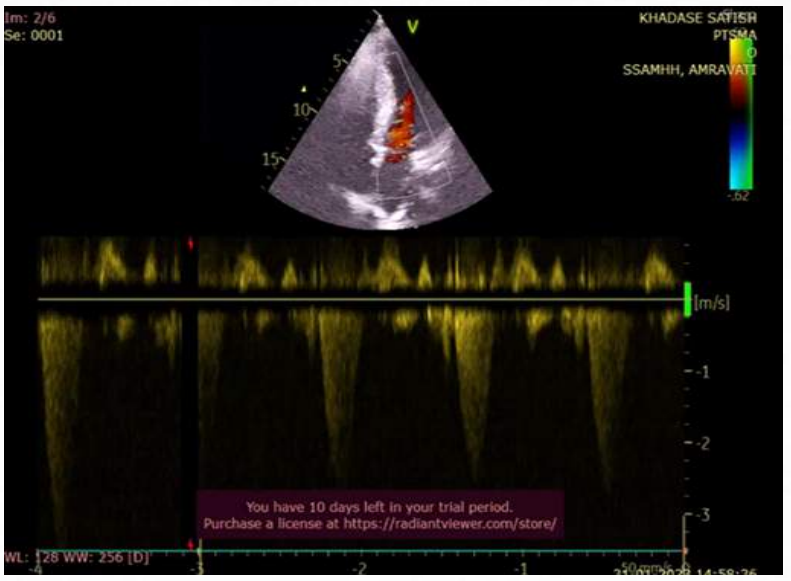


Image: Before Intervention

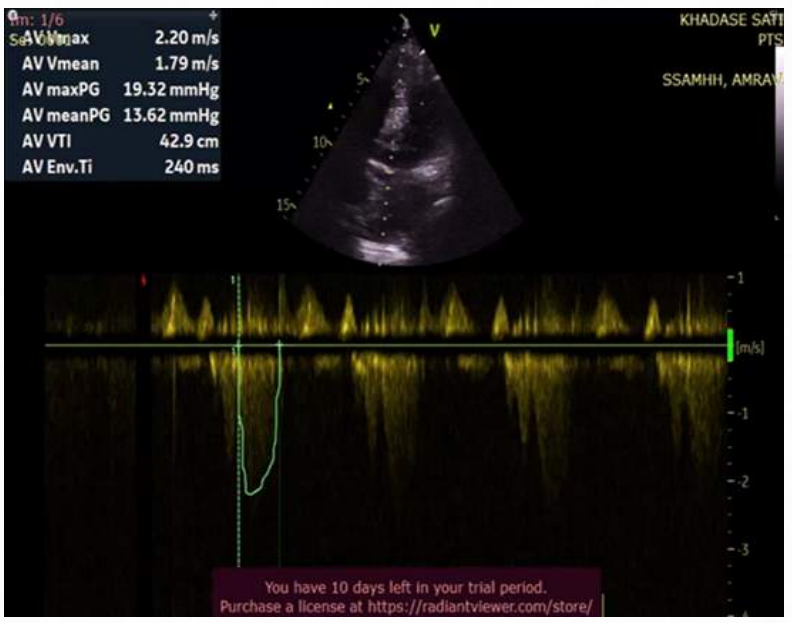


Image: After Intervention

The patient showed marked symptomatic improvement, with increased exercise tolerance and no significant arrhythmic events. Continuous follow-up was planned to monitor for late complications, such as septal perforation or conduction abnormalities.

Discussion

This case illustrates the complexity of managing persistent LVOTO post-myectomy. While repeat surgical intervention remains an option, ASA offers a less invasive alternative with promising outcomes. However, its use in post-myectomy patients presents technical and safety challenges.

Key Considerations in ASA Post-Myectomy

- **Patient Selection:** Identifying suitable candidates with significant residual obstruction and poor surgical candidacy.
- **Procedural Planning:** Use of appropriate imaging modalities (contrast echocardiography) to select the optimal septal branch.
- **Risk Management:** Careful monitoring for complications like VSD and CHB, particularly in patients with pre-existing conduction abnormalities.
- **Outcome Expectations:** While effective in reducing LVOTO, ASA requires long-term follow-up to assess sustained benefits and monitor adverse effects.

Conclusion

This case highlights the role of ASA as an effective alternative for managing persistent LVOTO in post-myectomy patients. Despite procedural complexities, careful patient selection and technique optimization can lead to significant symptomatic relief and improved hemodynamic outcomes. The findings reinforce the importance of individualized treatment strategies in HCM management.

CASE STUDY - 4

Acceptance to Insulin Pump Therapy Increases with Group Installation and Group Education

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Introduction

Insulin pump therapy has been widely recognized as a valuable tool for managing Type 1 Diabetes Mellitus (T1DM). Despite its clinical benefits, acceptance and adherence to insulin pump therapy remain low in non-government-approved settings due to various barriers, including cost, lack of education, and fear of technology. Traditional approaches involving individual patient education and installation have shown limited success in improving patient motivation and acceptance rates.

Peer support and group learning have been established as effective strategies for improving patient outcomes in chronic disease management. Group education allows patients to share experiences, receive peer encouragement, and enhance confidence in managing complex medical devices. This study explores the effectiveness of a group-based insulin pump education and installation program compared to individual installation, with the aim of improving acceptance and patient satisfaction.

Materials and Methods

A 3-hour insulin pump training workshop was organized at the Centre for Diabetes and Endocrine Research (CDER), Regency Health Care, Kanpur, India. The program involved 30 T1DM patients and their next of kin. The workshop included comprehensive education on insulin pump usage, hands-on training, and a question-and-answer session to address patient concerns.

Following the workshop, 12 patients were willing to proceed with insulin pump installation. However, 4 patients postponed the installation due to financial constraints. Eight patients opted for group installation. During the group installation, patients were encouraged to share their experiences and support each other throughout the process.

A follow-up study was conducted to assess the level of satisfaction and motivation among patients who underwent group installation compared to those who had previously undergone individual installation in similar settings. Key parameters evaluated included the number of sessions required for patient acceptance, self-motivation, age, gender, and educational background.

Results

Parameter	Group Installation	Individual Installation
Time for Convincing	1 session	4 to 5 sessions
Self-Motivation	7 out of 8 patients were self-motivated	No patient was self-motivated
Age Range	16 to 50 years	4 to 40 years
Gender	Male – 2, Female – 6	Male – 1, Female – 4
Education Level	Up to post-graduate	Up to post-graduate

The results highlighted significant differences in patient acceptance and motivation between group and individual installations:
Patients who underwent group installation exhibited higher self-motivation, requiring fewer sessions to accept insulin pump therapy. The group setting allowed patients to share experiences and learn from each other, enhancing confidence and comfort with the insulin pump. Peer support played a critical role in improving patient satisfaction and reducing psychological barriers to insulin pump adoption.

Conclusion

Group installation of insulin pumps, coupled with structured peer-supported education, significantly improves patient acceptance and satisfaction compared to individual installation. The peer interaction and shared learning environment strengthened patient confidence and motivation, reducing the

number of sessions required for acceptance. This study highlights the importance of integrating group-based education models in diabetes care to enhance the adoption and effectiveness of insulin pump therapy.

DIABETIC RETINOPATHY: AN OVERLOOKED WARNING SIGN OF CARDIOVASCULAR MORTALITY

Introduction: Beyond Vision Loss-A Systemic Warning

Diabetic retinopathy (DR) has long been recognized as one of the most common complications of diabetes, primarily linked to progressive vision impairment. However, emerging research suggests that DR is more than just an eye disease-it serves as a significant predictor of cardiovascular disease (CVD) mortality.

A newly published study in Scientific Reports sheds light on this crucial connection, revealing that DR is strongly associated with an increased risk of fatal cardiovascular events. The study followed 1,582 adults over a nine-year period, demonstrating that DR is not merely a complication of diabetes but an independent marker of systemic vascular dysfunction. These findings highlight the urgent need to integrate retinal screenings with cardiovascular risk assessments in diabetic patients.

By recognizing DR as an early indicator of broader vascular health deterioration, clinicians may be able to intervene sooner, reducing the risk of severe cardiovascular outcomes. This shift in perspective underscores the importance of comprehensive diabetes management strategies that go beyond blood sugar control to encompass overall vascular health.

Key Findings

1. Significant Increase in Cardiovascular Mortality Risk

The study found that individuals with any stage of DR had an 84% higher risk of cardiovascular-related death compared to those without DR. Notably, patients with proliferative diabetic retinopathy (PDR) the most severe form of the condition faced a fivefold increase in cardiovascular mortality risk.

This striking association suggests that retinal microvascular damage reflects broader vascular dysfunction throughout the body. Even patients with mild DR showed an elevated risk, emphasizing that early-stage DR should not be overlooked. Close monitoring and early intervention could potentially reduce cardiovascular complications in diabetic patients.

2. Diabetic Retinopathy Is an Independent Risk Factor for Cardiovascular Death

Even after adjusting for key cardiovascular risk factors including age, body mass index (BMI), cholesterol levels, smoking status, history of myocardial infarction, and hypertension - the association between DR and cardiovascular mortality remained significant. This confirms that DR is not simply a secondary outcome of shared risk factors but rather an independent predictor of cardiovascular death.

Many standard cardiovascular assessments may fail to fully capture the additional risk posed by DR. This underscores the need to incorporate retinal screening into cardiovascular risk evaluations for patients with diabetes.

3. The Increased Risk Affects Both Men and Women Equally

Both men and women with DR faced similarly elevated risks of CVD mortality, reinforcing the importance of universal screening and risk management strategies for all diabetic patients, regardless of gender. This challenges previous assumptions that cardiovascular risks may differ significantly between sexes and underscores the necessity for gender-neutral approaches in diabetic care.

4. Older Adults with DR Face the Highest Mortality Risk

The study revealed that patients aged 65 and older with DR had a particularly high risk of cardiovascular-related death. The cumulative impact of long-term microvascular damage likely contributes to worsening cardiovascular health over time. Chronic vascular stress from diabetes can lead to endothelial dysfunction, inflammation, and impaired circulation, which significantly elevate the risk of fatal cardiac events in older individuals.

For older diabetic patients with DR, a more aggressive approach to cardiovascular management may be required. Intensified monitoring and early intervention strategies could help mitigate their heightened risk.

5. The Link Between DR and Cardiovascular Death: Potential Mechanisms

The precise mechanisms explaining why DR correlates with increased cardiovascular mortality are still under investigation. However, researchers suggest several key factors:

- Chronic Inflammation: Elevated inflammatory markers in DR patients are linked to higher cardiovascular risk.
- Endothelial Dysfunction: Damage to the small blood vessels in the retina mirrors similar damage occurring in larger systemic arteries, including those supplying the heart and brain.
- Microvascular Abnormalities: The same microvascular issues that contribute to DR may also increase the risk of heart disease, stroke, and kidney disease.
- Vascular Integrity: DR may serve as a visible indicator of widespread vascular dysfunction, signalling damage that extends beyond the eyes.

Understanding these mechanisms could lead to targeted interventions that simultaneously address both retinal and cardiovascular health in diabetic patients.

Clinical Implications: The Need for Integrated Screening and Management

These findings call for a more comprehensive approach to diabetes care, where retinal screening plays a dual role-not just in preventing blindness but also in identifying patients at high risk of cardiovascular mortality.

- Retinal screening should be integrated into routine cardiovascular risk assessments for all diabetic patients.
- Patients with DR should be closely monitored for cardiovascular complications, regardless of their traditional risk profile.
- Education is crucial: Patients should be informed that DR is not just an eye condition-it can indicate broader systemic vascular issues.
- Aggressive management of cardiovascular risk factors (glycemic control, blood pressure, and lipid management) may be especially important in patients with DR.

Looking Ahead: A Shift in Diabetic Care Paradigms

This study reinforces the idea that diabetes management should not be limited to glucose control alone. Retinal health is a direct window into systemic vascular health, and ignoring DR could mean missing an opportunity to prevent life-threatening cardiovascular events.

With advancements in AI-based retinal imaging and telemedicine, integrating retinal screening into cardiovascular evaluations could soon become more accessible and widespread. Future research should focus on whether early intervention based on DR findings can actively reduce cardiovascular mortality rates in diabetic patients.

As the understanding of diabetic retinopathy as a systemic risk marker continues to grow, the question remains: Should retinal screening become a standard tool in cardiovascular risk stratification for diabetes? Given the evidence, the answer may be a resounding yes.

Reference: [Scientific Reports, 2025]

HIGH-SENSITIVITY TROPONINS AS PREDICTORS OF MORTALITY IN MASLD: LONG-TERM STUDY FINDINGS

A new long-term analysis has underscored the prognostic utility of high-sensitivity troponins (hs-troponin T and I) in patients with metabolic dysfunction-associated steatotic liver disease (MASLD) formerly termed non-alcoholic fatty liver disease (NAFLD). The findings, published in Alimentary Pharmacology & Therapeutics, indicate that elevated hs-troponin levels are significantly associated with increased all-cause and cardiovascular-specific mortality, even in individuals without a known history of cardiovascular disease.

The study observed that for every one-standard-deviation increase in hs-troponin T, there was a 29% increase in overall mortality and a 44% rise in cardiovascular-related deaths. Similar trends were noted for hs-troponin I, suggesting a consistent relationship between high-sensitivity cardiac biomarkers and adverse outcomes in this population.

Led by Donghee Kim from the Division of Gastroenterology and Hepatology at Stanford University School of Medicine, the research team emphasized the importance of identifying high-risk phenotypes within the MASLD population. Given the known predictive value of hs-troponin for future cardiovascular events, their objective was to assess its association with all-cause and cause-specific mortality in individuals with MASLD but no prior cardiovascular disease.

To conduct their analysis, the team utilized data from the National Health and Nutrition Examination Survey (NHANES), covering the period from 1999 to 2004, and linked it with mortality data extending through 2019. Cox proportional hazards models were applied to evaluate the relationship between hs-troponin levels and mortality outcomes in this group.

Key findings from the study include

- Over a median follow-up duration of 17.5 years, individuals with MASLD and elevated hs-troponin T levels demonstrated a significantly higher risk of both all-cause and cardiovascular mortality.
- These associations persisted even after adjusting for demographic variables, clinical and metabolic factors, and lifestyle characteristics.
- A one-standard-deviation increase in hs-troponin T was associated with a 29% higher risk of all-cause death (Hazard Ratio [HR]: 1.29).
- The same increment was linked to a 44% increase in cardiovascular mortality (HR: 1.44).
- Similar associations were observed between hs-troponin I levels and cardiovascular mortality across three distinct assay platforms.
- No significant association was found between hs-troponin levels and cancer-related deaths.

The authors suggest that incorporating hs-troponin testing in the clinical assessment of MASLD patients, even those without preexisting cardiovascular disease, may help identify subgroups at elevated risk of mortality, particularly from cardiovascular causes. Early detection of such individuals could facilitate more targeted interventions and potentially improve long-term outcomes.

Reference: Kim, D., Danpanichkul, P., Wijarnpreecha, K., Cholankeril, G., & Ahmed, A. Association of High-Sensitivity Troponins in Metabolic Dysfunction-Associated Steatotic Liver Disease With All-Cause and Cause-Specific Mortality. Alimentary Pharmacology & Therapeutics. https://doi.org/10.1111/apt.70128

FIFTY AND FORWARD: HOW MANAGING FIVE RISK FACTORS CAN ADD A DECADE OF DISEASE-FREE LIFE

A major global study links midlife cardiovascular risk control to longevity and better health outcomes

A recent study published in the New England Journal of Medicine has revealed powerful evidence that managing five key modifiable cardiovascular risk factors by the age of 50 can significantly increase life expectancy and reduce the lifetime risk of cardiovascular disease and all-cause mortality. Conducted by the Global Cardiovascular Risk Consortium (GCVRC), this comprehensive analysis brings a global perspective to the long-term benefits of cardiovascular risk reduction.

Background

If five modifiable risk factors are managed by age 50, this could buy ten extra years of life? Cardiovascular disease is the leading cause of death worldwide, responsible for one in every three global deaths. Five modifiable risk factors are estimated to drive nearly half of this burden.

While prior research has linked increased lifetime cardiovascular risk to a greater number of risk factors, much of it relied on static profiles or regional datasets. This new study fills a crucial gap by quantifying the global impact of modifiable risk factor absence or improvement on long-term CVD outcomes and overall mortality.

About the Study

The Global Cardiovascular Risk Consortium harmonized data from 2,078,948 individuals aged 18 years and older across 133 cohort studies in 39 countries on six continents. Participants were followed for up to 47 years. Those with pre-existing cardiovascular disease were excluded from disease-specific analyses. Risk factors were assessed at age 50, and lifetime risk projections extended to age 90.

The five risk factors assessed were

- Arterial hypertension: Systolic blood pressure ≥130 mm Hg
- Hyperlipidemia: Non-HDL cholesterol ≥130 mg/dL
- Diabetes: Based on diagnosis or medical history
- Smoking: Current use
- Abnormal BMI: <20 (underweight) or ≥25 (overweight/obese)

Outcomes included myocardial infarction, stroke, and death from cardiovascular or unknown causes. Sex-specific Weibull survival models were used to estimate CVD-free and overall life expectancy. Models were adjusted for global mortality patterns using WHO data, and statistical analysis was performed in R.

Key Findings

- Underweight individuals (BMI <20) had a 15% higher lifetime risk of CVD, challenging the notion that only overweight or obesity are detrimental.
- At age 50, individuals with all five risk factors had a lifetime CVD risk of 24% in women and 38% in men, compared to 13% and 21%, respectively, in those with none.
- Women with all five risk factors had an 88% chance of dying before age 90, compared to 53% for those with none. In men, the risk jumped from 68% (no risk factors) to 94% (all five).
- Women without any of the five risk factors at age 50 gained 13.3 additional CVD-free years and 14.5 extra years of life.
- Men free of all risk factors gained 10.6 CVD-free years and 11.8 additional years of life.
- Among individual risk factors, diabetes and smoking had the strongest negative impact on lifespan.
- Not having diabetes added 4.7 years of CVD-free life for women and 4.2 years for men.
- Avoiding smoking added 5–6 extra years of life for both sexes.
- Controlling systolic blood pressure (<130 mm Hg) led to 1.3–1.8 additional CVD-free years.
- Improving BMI to the normal range (20–24.9) resulted in 1.9–2.6 additional years, depending on the region.

Impact of Midlife Modification

Modifying risk factors even between ages 55 and 60 showed measurable benefits:

- Hypertension reversal added 2.4 CVD-free years for women and 1.2 for men.
- Smoking cessation added 2.1 death-free years for women and 2.4 for men.
- Improving four risk factors in this age range led to more than five extra years free from both CVD and premature death.

One key insight: participants who quit smoking after 50 but developed diabetes later lost up to 40% of their mortality-risk reduction, highlighting the importance of sustained, multi-factor management. These results

demonstrate the universal benefits of risk factor management, while also highlighting region-specific priorities in preventive care.

Conclusions

The absence of five common cardiovascular risk factors by age 50 is associated with over a decade of added life, both free from cardiovascular disease and premature death. More importantly, the study illustrates that it's never too late: even modest improvements in midlife deliver tangible benefits. These findings provide a strong, evidence-based rationale for earlier and sustained global investment in cardiovascular risk prevention. They also offer a powerful message to individuals: controlling blood pressure, quitting smoking, managing diabetes, and maintaining a healthy weight can profoundly impact both lifespan and healthspan.

Reference: Global Cardiovascular Risk Consortium. Global Effect of Cardiovascular Risk Factors on Lifetime Estimates, New England Journal of Medicine (2025). DOI: 10.1056/NEJMoa2415879

HEALTHY LIVING

1. Black Coffee and Diabetes: A Simple Habit That Could Lower Your Risk

Could your morning coffee be protecting you from type 2 diabetes? A landmark study from Harvard T. H. Chan School of Public Health, published in The *American Journal of Clinical Nutrition*, suggests that drinking coffee may significantly reduce the risk of developing type 2 diabetes-but only if you skip the sugar and artificial sweeteners.

This new research sheds light on how coffee consumption influences long-term metabolic health and highlights an important message: **what you add to your coffee matters just as much as drinking it.**

The Study: Coffee and Diabetes Risk Over 34 Years

To explore the link between coffee consumption and diabetes risk, researchers conducted an extensive analysis using data from nearly 290,000 people over 34 years across three major health studies.

Every four years, participants were asked to report

- How much coffee they drank (number of cups per day)?
- What they added to their coffee (sugar, artificial sweeteners, cream, or milk)?
- Any diagnosis of type 2 diabetes

Over the course of the study, 13,281 participants developed type 2 diabetes. This allowed researchers to evaluate how coffee intake, along with various additives, influenced diabetes risk over time.

Key Findings: Black Coffee Offers the Most Protection

The results revealed a clear and compelling trend-drinking coffee without sugar or artificial sweeteners was associated with a lower risk of developing type 2 diabetes.

1. Drinking black coffee daily reduces diabetes risk

Participants who drank one cup of black coffee per day experienced a 10% lower risk of developing type 2 diabetes compared to non-coffee drinkers.

For those who consumed multiple cups daily, the protective effect was even stronger, reinforcing the notion that coffee, when consumed correctly, may play a role in metabolic health.

2. Adding milk or cream? No problem!

The study found that adding milk or cream did not reduce the health benefits of coffee. This suggests that dairy additives do not interfere with coffee's potential protective effects against diabetes.

3. Sugar Cancels Out Half the Benefit

However, the protective effect dropped by 50% for participants who added just one teaspoon of sugar to their coffee. Instead of a 10% reduction in diabetes risk, those who added sugar saw only a 5% lower risk per cup.

4. Artificial Sweeteners Are Not a Great Alternative

Switching to artificial sweeteners instead of sugar didn't make much of a difference the risk reduction fell to 7%, indicating that artificial sweeteners may still weaken coffee's health benefits.

5. Non-Dairy Coffee Whiteners Showed No Clear Effect

The study did not find a definitive link between non-dairy coffee whiteners and diabetes risk, likely because too few participants used them to provide statistically significant data.

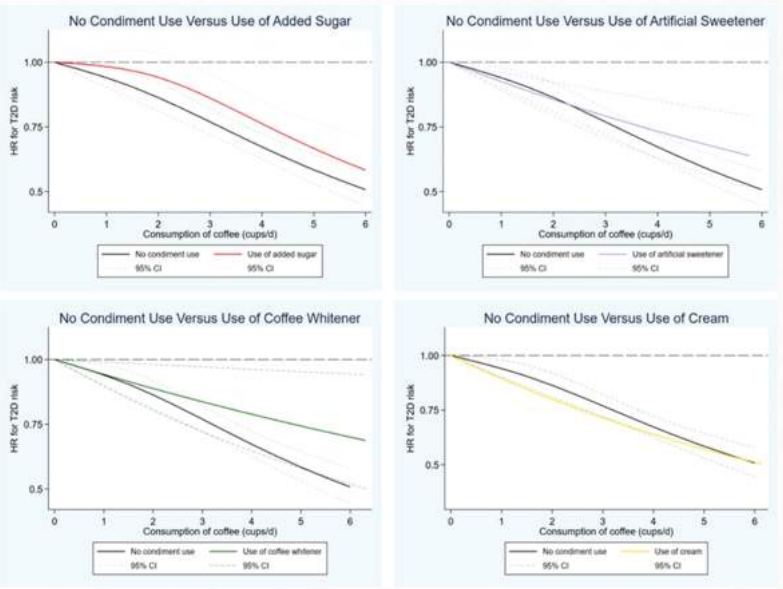

Fig. Association between consumption of coffee and T2D risk

What does this mean for us?

This large-scale, long-term study reinforces the idea that coffee, when consumed wisely, can be part of a diabetes prevention strategy. However, it also highlights a crucial factor how you drink your coffee matters.

By simply choosing to drink black coffee or coffee with milk/cream instead of sugar, individuals may lower their risk of type 2 diabetes, adding to the growing evidence that small dietary changes can lead to significant health benefits over time.

As diabetes rates continue to rise globally, such findings could help shape public health recommendations, encouraging people to rethink their coffee habits for better metabolic health.

Reference: Henn M, et al. Am J Clin Nutr. 2025. doi: 10.1016/j.ajcnut.2025.01.017.

2. Are Plastic Takeout Containers Harming Your Heart? New Research Raises Concerns

Introduction

When ordering takeout, most people worry about calories, fat content, or portion sizes. But have you ever considered the potential health risks of the container your food comes in?

A recent study published in "Ecotoxicology and Environmental Safety" has brought a surprising new concern to light: the plastics commonly used in takeout containers may be exposing consumers to harmful substances that could increase the risk of heart disease.

Plastic is widely used in food packaging because it is cheap, durable, and convenient. However, research has shown that microplastics and plastic-derived chemicals can make their way into our food and drinks. Previous studies have found these particles in bottled water, seafood, table salt, and even tea bags, meaning that people unknowingly consume millions of microscopic plastic particles each year. While earlier research has linked these substances to hormonal imbalances and metabolic disorders, this new study suggests that frequent exposure to plastic takeout containers may also contribute to heart disease, particularly an increased risk of congestive heart failure.

How Do Plastic Takeout Containers Affect Heart Health?

Plastics contain chemicals like bisphenol A (BPA) and phthalates, which are known to interfere with hormonal functions and may contribute to metabolic disorders. What makes takeout containers particularly concerning is that heating food in plastic accelerates the release of harmful substances. This means that consuming hot meals stored in plastic containers could result in even greater exposure to potentially toxic compounds.

To explore this potential connection between plastic exposure and heart disease, researchers conducted a study analyzing the relationship between takeout food consumption, plastic container usage, and cardiovascular health risks. The study examined data from 3,179 individuals, assessing their frequency of takeout consumption, use of disposable plastic containers, and overall heart health.

Key Findings: Frequent Takeout Plastic Use May Increase Heart Disease Risk

The study revealed a notable association between frequent plastic exposure and heart health concerns. Individuals who regularly used plastic takeout containers had a 13% higher likelihood of developing congestive heart failure compared to those with lower plastic exposure. This suggests that plastic-derived chemicals may contribute to cardiovascular damage over time, possibly by affecting blood vessels, increasing inflammation, or disrupting the body's hormonal balance.

Animal studies conducted as part of this research provided further insights. Scientists observed that rats exposed to microplastics experienced significant disruptions in gut bacteria, increased inflammation, and damage to heart muscle cells. These findings indicate that plastic exposure may negatively impact heart health by altering gut microbiota, leading to higher levels of inflammation and oxidative stress in the cardiovascular system.

Experts believe that oxidative stress an imbalance between free radicals and antioxidants may be a key mechanism behind plastic-related heart risks. According to Aidan Charron, a biologist and associate director at EarthDay.org, exposure to plastic materials like lunch containers may contribute to oxidative stress within the cardiovascular system, which could potentially lead to cardiovascular disease. Oxidative stress has been linked to blood vessel damage, heart tissue deterioration, and an increased risk of cardiovascular events such as heart attacks and strokes.

Are These Findings Definitive? Experts Weigh In

While these results highlight potential risks, some researchers urge caution in interpreting the findings. Andrea De Vizcaya-Ruiz, a professor of environmental and occupational health at UC Irvine's Joe C. Wen School of Population & Public Health, explains that the study's conclusions remain speculative and do not necessarily establish plastic exposure as a significant cardiovascular disease risk factor.

One limitation of the study was that it primarily focused on individuals aged 60–70 years old from a single ethnic group, which restricts the ability to generalize the findings to a broader population. To confirm a clear association between plastic exposure and cardiovascular diseases, future studies will need to include a more diverse sample of participants in terms of age and ethnicity. While further research is necessary to fully understand how plastic exposure impacts cardiovascular health, the potential risks raised by this study should not be ignored.

What Does This Mean for Everyday Takeout Consumers?

With plastics being an unavoidable part of modern food packaging, many people may be unknowingly exposing themselves to harmful substances that could impact their heart health over time. While takeout containers offer convenience, their potential role in gut health disruption, inflammation, and cardiovascular stress is a reminder that small, everyday choices regarding food packaging can have long-term health implications.

Reducing exposure to plastic from takeout containers does not require completely eliminating takeout food from your lifestyle. Simple changes can make a significant difference. Avoid heating food in plastic containers, even if they are labeled as microwave-safe, since heat increases the release of harmful chemicals. Instead, transfer food to a ceramic or glass dish as soon as possible. Choosing restaurants that use non-plastic packaging, such as biodegradable or cardboard containers, can also help limit exposure. Additionally, opting for reusable utensils instead of plastic cutlery and avoiding plastic straws are small steps that can reduce overall plastic intake.

The Bigger Picture: A Balanced Approach to Heart Health

While concerns over microplastics and plastic-related chemicals are growing, experts emphasize that plastic exposure is just one factor among many that influence heart health. Amanda Sauceda, a registered dietitian based in California, points out that many people focus on eliminating environmental toxins but overlook more immediate dietary and lifestyle factors that have a greater impact on cardiovascular health. She highlights that most Americans do not consume enough fiber, fruits, or vegetables, which are essential for heart health.

Instead of striving for perfection when it comes to avoiding plastics, a more practical approach is to focus on what is within your control without making life unnecessarily difficult. Since changes in gut microbiota from microplastic exposure have been linked to heart health concerns, incorporating more fiber-rich foods can help support a healthy gut microbiome and strengthen the gut barrier.

The Bottom Line

While more research is needed to confirm the long-term cardiovascular risks of plastic exposure, this study raises valid concerns about the potential health impact of frequent contact with plastic food containers. The findings suggest that frequent use of plastic takeout containers, particularly for hot foods, may contribute to increased exposure to microplastics and chemical additives, both of which have been linked to inflammation and cardiovascular stress.

If takeout food is a regular part of your lifestyle, making small habit changes such as transferring food to non-plastic containers, avoiding microwaving plastic, and prioritizing gut-friendly, fiber-rich foods can help minimize potential risks. As scientists continue to explore the hidden health effects of plastic exposure, being mindful of food packaging choices may be an important step toward protecting long-term heart health and overall well-being.

TOP 10 Emergency Stress Stoppers

Try these tips to reduce stress fast.

1. Count to 10 before you speak or react.
2. Take a few slow, deep breaths until you feel your body relax a bit.
3. Go for a walk, even if it's just to the restroom and back. It can help break the tension and give you a chance to think things through.
4. Try a quick meditation or prayer to get some perspective.
5. If it's not urgent, sleep on it and respond tomorrow. This works well for stressful emails and social media trolls.
6. Walk away from the situation for a while, and handle it later once things have calmed down.
7. Break down big problems into smaller parts. Take one step at a time instead of trying to tackle everything at once.
8. Chill out with music or an inspirational podcast to help you rage less on the road.
9. Take a break to pet a dog, hug a loved one or help someone.
10. Work out or do something active. Exercise is one of the best antidotes for stress.

Get more wellness tips at
heart.org/HealthyForGood

AI in Healthcare: A Revolution or a Risk?

Artificial Intelligence in healthcare is not science fiction, it's happening now. From predicting heart attacks before they occur to guiding robotic surgeries, AI is transforming medicine. But will it replace human expertise? Or is it simply the next step in medical evolution?"

Artificial Intelligence (AI) is no longer a futuristic concept, it is actively transforming healthcare at every level. From improving diagnostics and treatment planning to streamlining hospital operations and patient care, AI is a powerful tool that enhances efficiency and outcomes. AI is reshaping the landscape, supporting doctors, and improving accessibility. However, its adoption also comes with challenges, including data privacy concerns, regulatory hurdles, and the need for human oversight. Let's explore the various ways AI is making an impact, incorporating insights from leading Indian clinicians and industry experts.

AI - A Partner, Not a Replacement

Medicine has always evolved with technology, but AI is unlike anything we've seen before. From predicting heart attacks before they happen to guiding robotic surgeries, AI is redefining how we diagnose and treat diseases. In India, where medical resources are often stretched thin, AI is proving to be a game-changer, helping us reach remote areas, speed up diagnoses, and even reduce costs.

Yet, there is a fear that AI might replace human expertise. But AI will never replace the empathy, intuition, and judgment of a doctor. Instead, it enhances the ability to make informed decisions, reducing human errors and improving patient outcomes.

Where AI is Transforming Indian Healthcare

1. AI in Diagnostics: Seeing Beyond the Human Eye

AI-powered imaging tools can detect cancers, fractures, and neurological disorders faster and more accurately than the human eye.

"The biggest cost in a hospital is manpower, and AI can significantly enhance the efficiency of doctors."

Dr. Devi Shetty,
Chairman of Narayana Health

2. AI in Pathology: A Second Opinion at Lightning Speed

AI in pathology helps analyze tissue samples and detect abnormalities more efficiently. For a pathologist, having an AI tool that double-checks your findings is invaluable it acts like an ever-vigilant second opinion.

"We need to balance the art and science of medicine."

Dr. Randeep Guleria
Former AIIMS Director

3. AI in Cardiology: Predicting Heart Attacks Before They Happen

AI-powered ECG analysis can detect silent heart attacks, those that show no obvious symptoms but can be fatal. AI models predict heart disease risks in diabetics years before symptoms appear, allowing for early intervention.

4. AI in Surgery: The Rise of Robotic Precision

Robotic surgery, powered by AI, enhances precision, reduces complications, and speeds up recovery times. AI-assisted procedures minimize bleeding, reduce post-op pain, and lead to faster recovery.

5. AI in Drug Discovery: Speeding Up the Cure

AI is revolutionizing drug discovery, cutting research time from decades to months. AI-driven research accelerated vaccine development during COVID-19, and it's now helping find new treatments for tuberculosis and cancer. The idea that AI could fast-track a cure for diseases like Alzheimer's is one of the most exciting prospects in medicine today.

The Roadblocks to AI Adoption

Despite its potential, AI in healthcare faces hurdles:

- AI relies on patient data, raising ethical concerns about confidentiality.
- Patients trust human doctors over algorithms—rightfully so.
- AI-based tools need government approvals, slowing down adoption.
- Many healthcare professionals lack AI training, making it hard to integrate into daily practice.

Dr. Shashank Joshi, a leading endocrinologist, emphasized the importance of medical supervision when implementing AI in healthcare:

"AI has clearly made its entry into the healthcare delivery model space, particularly in chronic disease modeling... Not only does it give us the right information, but it also allows us to make corrections under medical supervision on how to improve the outcome, health outcome, and happiness outcome."

AI is Here to Stay – Let's Use it Wisely

"AI is no longer optional, it's essential. The question isn't if AI will revolutionise healthcare, but how we choose to use it. We must embrace it responsibly, ensuring it complements human expertise, not replaces it."

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