

COVID -19: Footprints left behind are way terrific than the tornado itself...!



nature medicine

OPEN Long-term cardiovascular outcomes of COVID-19

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The cardiovascular complications of acute coronavirus disease 2019 (COVID-19) are well described, but the post-acute cardiovascular manifestations of COVID-19 have not yet been comprehensively characterized. Here we used national healthcare databases from the US Department of Veterans Affairs to build a cohort of 153,760 individuals with COVID-19, as well as two sets of control cohorts with 5,637,647 (contemporary controls) and 5,859,411 (historical controls) individuals, to estimate risks and 1-year burdens of a set of pre-specified incident cardiovascular outcomes. We show that, beyond the first 30 d after infection, individuals with COVID-19 are at increased risk of incident cardiovascular disease spanning several categories, including cerebrovascular disorders, dysrhythmias, ischemic and non-ischemic heart disease, pericarditis, myocarditis, heart failure and thromboembolic disease. These risks and burdens were evident even among individuals who were not hospitalized during the acute phase of the infection and increased in a graded fashion according to the care setting during the acute phase (non-hospitalized, hospitalized and admitted to intensive care). Our results provide evidence that the risk and 1-year burden of cardiovascular disease in survivors of acute COVID-19 are substantial. Care pathways of those surviving the acute episode of COVID-19 should include attention to cardiovascular health and disease.

Post-acute sequelae of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)—the virus that causes coronavirus disease 2019 (COVID-19)—can involve the pulmonary and several extrapulmonary organs, including the cardiovascular system. A few studies have investigated cardiovascular outcomes in hospitalized individuals (who represent the minority of people with COVID-19), and all had a short duration of follow-up and a narrow selection of cardiovascular outcomes^{1–3}. A comprehensive assessment of post-acute COVID-19 sequelae across the spectrum of COVID-19 sequelae across the spectrum of care settings of post-acute infection (non-hospitalized, hospitalized and admitted to intensive care) are also lacking. Addressing this knowledge gap will inform post-acute COVID-19 care strategies.

In this study, we used the US Department of Veterans Affairs

respectively. The COVID-19, contemporary control and historical control groups had 159,366, 5,854,288 and 6,082,182 person-years of follow-up, respectively, altogether corresponding to 12,095,836 person-years of the COVID-19, contemporary control and historical control groups before and after weighting are presented in Supplementary Tables 1 and 2, respectively.

Incident cardiovascular diseases in COVID-19 versus contemporary control. Assessment of covariate balance after application of inverse probability weighting suggested that covariates were well balanced (Extended Data Fig. 1a). We estimated the risks of a set of pre-specified cardiovascular outcomes in COVID-19 versus contemporary control; we also estimated the adjusted excess burden of cardiovascular outcomes due to COVID-19 per 1,000 persons at 12 months on the basis of the difference

What you must know?

- Covid-19 also causes complications outside of the lungs including heart and brain
- Thrombotic vascular events such as Stroke and MI
- Studies suggest that significant numbers of covid patients have had stroke

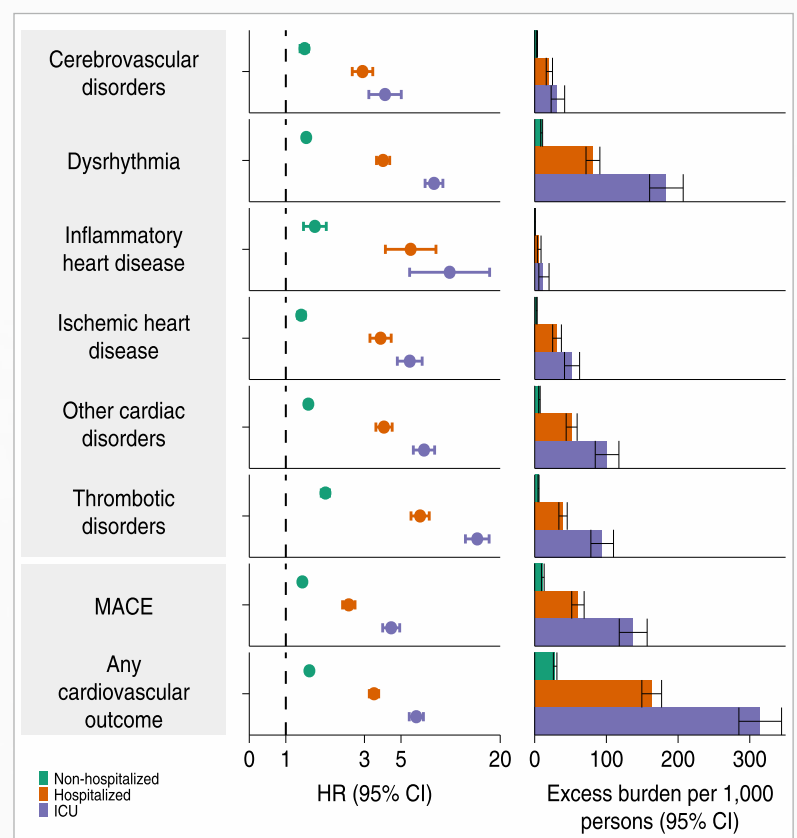
The cardiovascular complications of acute coronavirus disease 2019 (COVID-19) are well described, but the post-acute cardiovascular manifestations of COVID-19 have not yet been comprehensively characterized. While earlier it was believed that Covid caused cardiovascular disease or ailments of the heart or the blood vessels, in the acute phase or soon after the onset of infection, a large study published recently in the journal Nature medicines suggests complications can occur even up to a year after the infection. Such problems are more common in patients who require covid hospitalization.

Based on the analysis of medical records maintained by the US Department of Veterans Affairs, that nation's largest integrated healthcare delivery system, the researchers assessed cardiovascular outcomes in more than 1.5 lakh Covid patients from March 1, 2020, to January 15, 2021, and who survived the first 30 days of the disease.

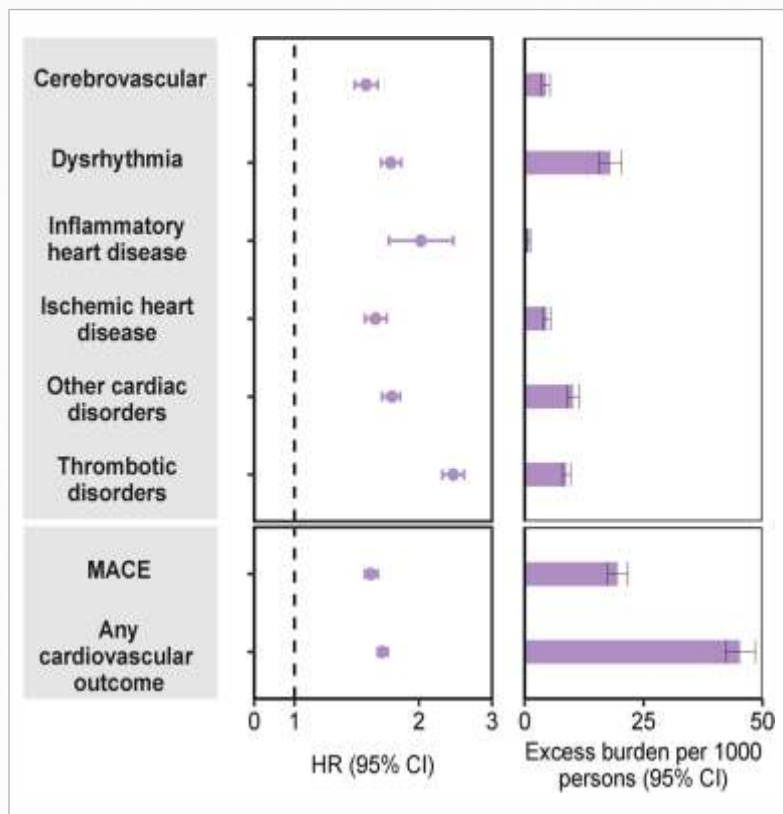
Their outcome was compared with those of two other groups: a control group of more than 5.6 million patients who did not have Covid in the same time frame and a control group of over 5.8 million people who were patients from March 2018 to January 2019, well before the Covid pandemic.

They found that compared with the control groups, Covid patients were **1.7 times** more likely to develop cardiovascular disorders, **1.5 times** more likely to develop stroke, and **1.7 times** more likely to have dysregulated heart rhythm.

Risks and 12-month burdens of incident post-acute COVID-19 composite cardiovascular outcomes compared to the historical control cohort by care setting of the acute infection.



Risks and 12-month burdens of incident post-acute COVID-19 composite cardiovascular outcomes in participants without any history of cardiovascular outcomes prior to COVID-19 exposure compared to the historical control cohort.



some patients find that anticoagulants can be difficult to tolerate because they increase the risk of bleeding problems. For those patients who have non-valvular atrial fibrillation, are at increased risk for stroke, are suitable for short-term anticoagulation therapy (blood thinning medication) but have an appropriate reason not to take anticoagulation therapy, using the Amulet device to close off the left atrial appendage from the bloodstream may be a reasonable option.

In a clinical study of 1,878 patients, about 80% of patients stopped anticoagulation medication after a successful procedure. After 18 months, only 2.8% of patients with the device experienced a stroke or other serious artery blockage issue from a blood clot.

The Amplatzer Amulet Left Atrial Appendage (LAA) Occluder should not be used in patients:

- With a blood clot in their heart
- With an active blood infection
- Where placing the device would impact the working of the heart

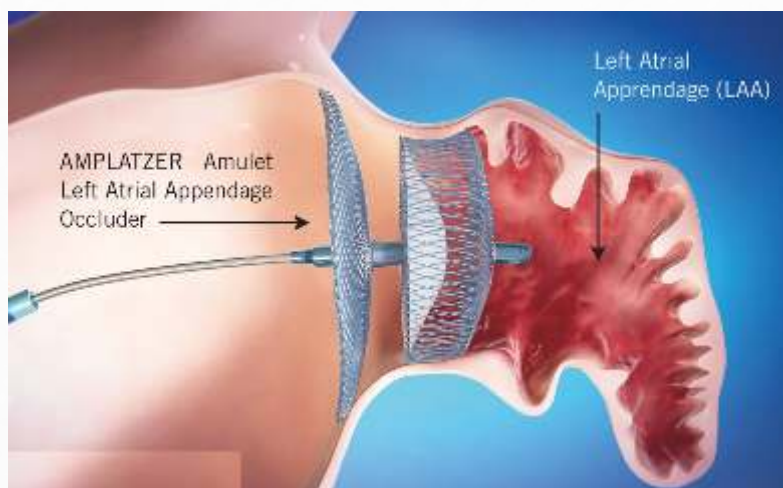
How does it work?

A physician inserts the delivery catheter into a blood vessel (vein) in the groin and advances it to reach the right upper chamber of the heart (right atrium). A small hole is made in the wall between the two upper chambers of the heart so that the catheter can pass through to reach the left atrial appendage. Through the catheter, the physician delivers the Amulet device to the left atrial appendage. When the device is positioned properly in the appendage, it covers the opening of the appendage. Over time, a thin layer of tissue will grow over the surface of the Amulet device. This keeps any blood clots in the left atrial appendage from entering the bloodstream.

Section A: New Medical Devices

1. Amplatzer Amulet Left Atrial Appendage Occluder

The Amplatzer Amulet Left Atrial Appendage Occluder (LAO) is a permanent implant that is placed in the patient’s left atrial appendage (LAA), which is a pouch-like part of the heart. The device is intended to prevent blood clots formed in the LAA from entering the bloodstream and potentially causing a stroke. The device is made of a Nitinol (nickel-titanium) mesh with a polyester fabric cover.



The Amplatzer Amulet Left Atrial Appendage Occluder is used in patients who have nonvalvular atrial fibrillation (atrial fibrillation that is not related to heart valve disease). In atrial fibrillation, the two upper chambers of the heart (right and left atria) no longer contract normally. As a result, the blood flow within the atria can be slower than normal. This change in blood flow may cause blood clots to form, especially in the left atrial appendage. The blood clots that form in the left atrial appendage can break loose, travel through the bloodstream, and block a blood vessel in the brain. If this occurs, the part of the brain that is supplied by that blood vessel can become permanently damaged within minutes. This type of brain damage is known as a stroke.

To reduce the chance that blood clots form, atrial fibrillation patients who are at increased risk for stroke are treated with anticoagulants. Most patients can safely take these medications for years without serious side effects. However,

Implant Procedure:



2. Neuromodulation to Treat Obstructive Sleep Apnea



Obstructive Sleep Apnea (OSA)

- It is a debilitating, often life-threatening sleep disorder
- OSA is extremely common. Prevalence is similar to diabetes or asthma
- Over 100 million people worldwide suffer from OSA, of which only 25% are currently being treated

- Continuous Positive Airway Pressure (CPAP) device is the established therapy
- Loss of tongue muscle tone during sleep obstructs most patients with OSA
- More than 5 million patients own CPAP machines in North America
- Studies have shown that more than 46% do not comply with CPAP

If left untreated, OSA can result in

- High blood pressure
- Stroke
- Heart failure, irregular heartbeats, and heart attacks
- Diabetes
- Depression
- Worsening of ADHD
- Headache
- Poor performance in everyday activities
- Motor vehicle crashes

Innovation

A new implantable medical device is helping over 21 million Americans who suffer from obstructive sleep apnea to find a peaceful night's sleep. Instead of the old Continuous Positive Airway Pressure (C.P.A.P.) device, this neuromodulator is surgically implanted in a minimally invasive procedure that uses a system to sense breathing patterns and deliver mild stimulation to the tongue and throat to keep the patient's airways open.

LivaNova THN Sleep Therapy is an implantable therapy for the treatment of Obstructive Sleep Apnea (OSA), a very serious condition that affects millions of patients worldwide and occurs when the muscles in your airway relax during sleep, causing your airway to narrow or close as you breath in depriving your brain of oxygen.

This sleep apnea implant delivers therapy through neurostimulation technology and was specifically designed to deliver muscle tone to key tongue muscles, effectively controlling upper airway flow and significantly reducing or eliminating sleep apnea. THN Sleep Therapy is indicated for patients with moderate to severe OSA who are unable or unwilling to use continuous positive airway pressure (CPAP) therapy.

Epidemiological studies show a steady rise in the prevalence of obstructive sleep apnea (OSA). Untreated OSA is responsible for numerous chronic health conditions, motor vehicle, and workplace-related accidents leading to substantial economic burden both to the individual and society.

Multiple causes for OSA and a wide range of consequences have made its diagnosis and treatment difficult. Obstructive sleep apnea may be caused by anatomical variation, increased collapsibility of the upper airway, low sleep arousal threshold, and exaggerated response to desaturation.

Lifestyle changes, anatomical corrective surgeries, and oral appliances have been used but patient compliance is poor as it interferes in the daily routine. Neuromodulation is a promising functional modifying option that addresses the cause of obstructive sleep apnea at multiple levels.

This innovative medical device is controlled by the patient with either a remote or wearable patch and acts like a pacemaker that helps to synchronize the intake of air with the action of the tongue. Positive results from clinical tests of this neuromodulation system boast a high reduction percentage of the marker of sleep apnea severity and oxygen desaturation events from the baseline.

Section B: Patent expirations coming this decade



1. ELIQUIS (Apixaban)

Company: Bristol Myers Squibb & Pfizer

Key patent expirations: 2027 to 2029

Approved indication: ELIQUIS is a factor Xa inhibitor anticoagulant indicated to reduce the risk of stroke and systemic embolism in patients with nonvalvular atrial fibrillation.

Apixaban is an oral, reversible, and selective active site inhibitor of FXa. It does not require antithrombin III for antithrombotic activity. Apixaban inhibits free and clot-bound FXa and prothrombinase activity. Apixaban has no direct effect on platelet aggregation, but indirectly inhibits platelet aggregation induced by thrombin. By inhibiting FXa, apixaban decreases thrombin generation and thrombus development.

2. Trulicity (Dulaglutide)

Company: Eli Lilly

Key patent expirations: 2027 to 2029

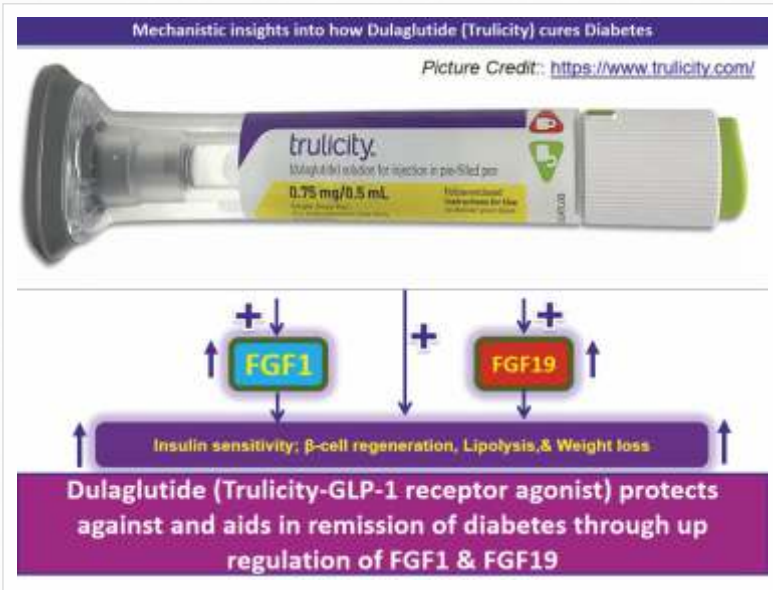
Approved indication: TRULICITY is a glucagon-like peptide-1 (GLP-1) receptor agonist indicated:

- As an adjunct to diet and exercise to improve glycemic control in adults with type 2 diabetes mellitus.
- To reduce the risk of major adverse cardiovascular events in adults with type 2 diabetes mellitus who have established cardiovascular disease or multiple cardiovascular risk factors.

Mechanism of Action:

TRULICITY contains dulaglutide, which is a human GLP-1 receptor agonist with 90% amino acid sequence homology to endogenous human GLP-1 (7-37). Dulaglutide activates the GLP-1 receptor, a membrane-bound cell-surface

receptor coupled to adenylyl cyclase in pancreatic beta cells. Dulaglutide increases intracellular cyclic AMP (cAMP) in beta cells leading to glucose-dependent insulin release. Dulaglutide also decreases glucagon secretion and slows gastric emptying.



Section C: Medication non-adherence

WHO CARES? (It's time to...)

According to the AMA, "A patient is considered adherent if they take 80% of their prescribed medicine(s). If patients take less than 80% of their prescribed medication(s), they are considered non adherent." It is considered that the effectiveness of treatment depends on both efficacies of the medication and patient adherence to the therapeutic regimen. Patient counseling ensures proper use and the best therapeutic action of the medicines.

What happens if patients don't adhere to medication treatment?

- Medicines don't produce desired outcomes if the patient takes them irregularly.
- Disease progression leads to severity.
- Body does not respond to the treatment properly and the disease gets severe over the period.
- Patients have to get hospitalized frequently due to increased severity of the condition.
- Medical treatment increases the financial burden due to disease complexity.
- Due to sufferings, patient can't enjoy Good Quality of Life.

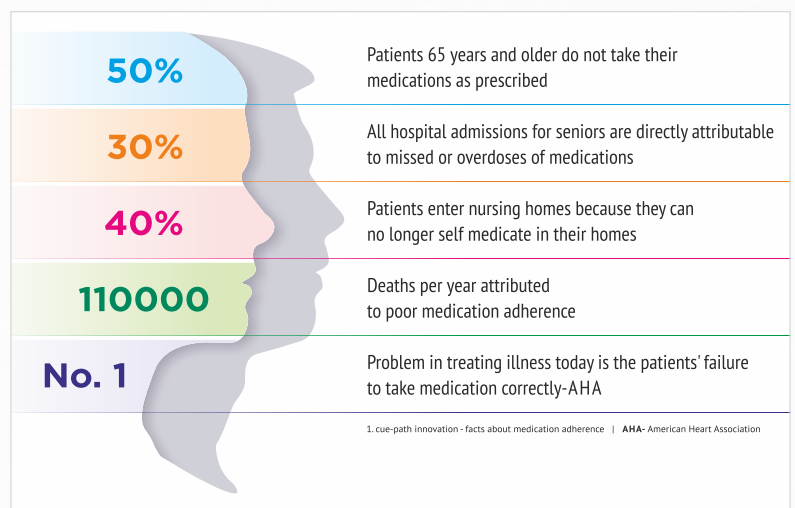
Considering the significant role that cost can play in contributing to non-adherence, health experts should know how to help patients overcome this obstacle. The cost must always be a topic covered by health experts when discussing medication regimens with patients. In addition, health experts must be prepared to provide resources to help patients reduce their medication costs. Such resources can include information on obtaining financial assistance, safely ordering medications by e-delivery, and identifying and using a preferred pharmacy.

The follow-up counseling with the patient involves establishing caring relationships, assessing the patient knowledge of the disease's cons and process of administering medications. The extension of the same includes information regarding its trade name, expected benefits, and action of the drugs on the body in certain cases. Limited health literacy is associated with medication nonadherence (in addition to a slew of other wellness and financial challenges). When patients are unable to grasp critical concepts, such as how to fill a medication, how to take a medication, when to take a medication, how much of a medication to take, and when and how to refill a medication, achieving and then maintaining adherence becomes very difficult, if not impossible.

How low medication adherence affects diabetic patients?

- Medical expense gets increased due to the addition of extra medicines to stabilize health condition.
- Frequent surges in blood sugar level increases the risk of hospitalization.
- Uncontrolled blood sugar level increases the treatment complexity and patient convenience.
- Uncontrolled blood sugar levels invite Diabetes Retinopathy, Diabetes Nephropathy, Diabetes Neuropathy, etc.
- Patient can't enjoy Good Quality of Life due to frequent episodes of uneasiness, fatigue, and dehydration (compromised QOL)

Facts about Medication Non-adherence



Section D: Case Studies

Case Study: 1

High-Risk Individuals for Development of Type 2 Diabetes

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DM Endo, Ghaziabad



Clinical Case - A 41-year-old man's F/PP blood glucose values, 304/487 mg/dl, came out in a free diabetes camp. He was very surprised to see this because he was completely healthy. Let us discuss some clinically relevant facts related to this person before treating him.

Query 1 - Can someone remain asymptomatic after having diabetes? If so, who should be screened for diabetes and when?

Suggestions about 50% of type 2 diabetics are asymptomatic. For this reason, due to being in unnoticed hyperglycemia for a long time, many times they can be diagnosed only after damage to the target organ. In this condition, they may replace the initial symptoms of hyperglycemia (such as polyuria, polydipsia, polyphagia, generalized weakness, and lethargy) with worsening symptoms caused by damage to these target organs.

Keep in mind that once these target organs are damaged, it is not possible to cure them completely. That's why a healthy population, and especially high-risk individuals, should have a routine screening of blood glucose from time to time. The real contribution of diabetes detection camps is in identifying these individuals.

Screening for diabetes

Those high-risk individuals who must have this screening done:

- **Obesity** - Keep in mind, obesity is the most important factor that increases the risk of type 2 diabetes. Compared to other ethnic populations of the world, the increased risk of diabetes due to weight gain is highest among us Indians. That is why, in a world where the cutoff of BMI is considered to be 25 kg/m² to be called obesity, its side effects start from 23 kg/m² in Indians.

Therefore, every Indian must get screened for diabetes, especially those people who also have the following symptoms together.

First-degree relative with diabetes - i.e. if their mother, father, brother, sister, son, or daughter has diabetes

- **Hypertension:** if BP is more than 140/90 mmHg or taking its medicine
- **Dyslipidemia:** if HDL cholesterol is less than 35 mg/dL or triglyceride is greater than 250 mg/dL
- Symptoms related to insulin resistance such as acanthosis nigricans in the nape of the neck
- **Polycystic ovary syndrome:** because this disorder is also related to insulin resistance

Physical activity - as this also increases insulin resistance

- Prediabetes - if fasting plasma glucose is greater than 100 mg/dL (impaired fasting glucose - IFG), if postprandial plasma glucose is greater than 140 mg/dL (impaired glucose tolerance - IGT) or HbA1C greater than 5.7%
- GDM - If a woman has had GDM in any pregnancy

Although these tests are proposed in normal individuals after the age of 45, due to the high probability of diabetes in Indians, at whatever age these symptoms are being found, then this screening should be done.

If glucose levels are found to be normal in the first screening, then they should be repeated every 3 years. Prediabetes, that is, the pre-diabetes stage, has a high probability of developing diabetes, as these tests should be repeated every year.

Ref: <http://medicalconceptsinihindi.in/post/Clinical-case-1,1---High-risk-individuals-for-development-of-type-2-diabetes>

Thank you Dr. Pankaj Agarwal for being the dedicated, thoughtful, and compassionate doctor that you are! You always go above and beyond & work tirelessly towards a healthy outcome. We, at Aprica Healthcare, feel so blessed for your valuable efforts and commitment to supporting the patients' health benefits by providing critical care.

Case Study: 2

A 43-Year-Old Man With a History of Smoking and Current Pressure in the Middle of the Chest and Dyspnea

History:

A man presents with pressure in the middle of the chest and dyspnea. He is 5 feet 10 inches and weighs 166.5 lb (BMI, 23.9). The patient reports a history of smoking of fewer than 10 years, noting that he quit after college, and explains that his father has cardiovascular disease (CVD). Palpation detects a diffusely thickened Achilles tendon. Although the patient is currently taking lipid-lowering medication, laboratory analysis is remarkable for low-density lipoprotein cholesterol (LDL-C) level of 294 mg/dL.

Examination:

Based on the patient's presentation, as well as his personal and family history, familial ligand defective apolipoprotein B-100 (FLDB) is a possible cause of the syndrome seen in this case. This syndrome is caused by an abnormality at the binding site of apolipoprotein B-100, which impedes its role as a ligand for the receptor. Such patients often present with cutaneous manifestations and an increased risk for premature coronary artery disease (CAD).

Still, because the patient has elevated LDL-C, chronic illnesses such as hypothyroidism, as well as liver or renal impairment, must be ruled out of the differential diagnosis. Hypothyroidism may be asymptomatic, but classic symptoms are nonspecific and include cold intolerance, puffiness, decreased sweating, and coarse skin. Myxedema coma is a severe form of hypothyroidism that results in altered mental status, hypothermia, bradycardia, hypercapnia, and hyponatremia; it commonly occurs in individuals whose disease has not yet been diagnosed or treated. In addition, a history of chronic symptoms-months of fatigue, weight loss, anorexia, nocturia, sleep disturbance, and pruritus -suggests chronic kidney disease, which is unlikely in this case. Acute liver failure can affect young people, but the patient's history is not consistent with this presentation (ie, alcohol use or a family history of liver disease).

Investigation:

To further investigate whether this patient has FLDB, genetic testing should be performed. In this case, the results of the patient's genetic testing do not come back with an identifiable mutation.

Although LDL receptor analysis can be used to identify the specific LDL receptor defect, this is an expensive approach that can only be performed at selected research laboratories. The results do not influence treatment decisions. LDL receptor or apolipoprotein B-100 studies, however, can help distinguish familial defective apolipoprotein B-100 from familial hypercholesterolemia, though these results would also not change the management.

Biopsy of xanthomas and xanthelasmas can be helpful when the diagnosis is unclear. Xanthelasmas and xanthomas in the setting of familial hypercholesterolemia will contain accumulated cholesterol, whereas eruptive xanthomas in patients with hypertriglyceridemia will contain triglycerides.

Lipoprotein electrophoresis is expensive and is unnecessary in this workup approach. Diagnosis of familial hypercholesterolemia (FH) can be confirmed via pathogenic genetic testing. Genetic diagnosis of FH may involve testing for known pathogenic variants in the genes (LDL receptor [LDLR], APOB, and PCSK9) or whole-gene sequencing. Genetic testing may also offer insight into cardiac risk and diagnosis, allowing for risk stratification and informing treatment decisions. Critically, however, a diagnosis of FH cannot be excluded if a mutation is not identified; many patients with a definitive clinical diagnosis of FH do not have a causative mutation, like the patient in the current case.

FLDB causes a syndrome nearly indistinguishable from heterozygous FH. But a key consideration, in this case, is the fact that the patient is already on statin therapy and was still not able to achieve target LDL-C levels. Although genetic testing did not identify a causative gene, it can be surmised from the clinical picture, together with the patient's history, that the condition in question is heterozygous autosomal recessive hypercholesterolemia. FH is an autosomal dominant disorder that leads to significantly elevated LDL-C levels from birth and results in early-onset CAD. Extensor tendon xanthomas (primarily Achilles, subpatellar, and hand extensor tendons) with significantly high LDL-C levels are specific for FH, though a family history of CAD and elevated LDL-C levels are often the only evidence available.

It also appears that this patient has a severe form of the disease. The International Atherosclerosis Society defines severe disease based on LDL-C level and the presence of known clinical risk factors for atherosclerotic CVD (ASCVD). These risk factors are age >40 years without treatment, male sex, smoking, lipoprotein(a) level >50 mg/dL (75 nmol/L), history of early CAD in first-degree relatives, BMI >30, and history of diabetes or chronic kidney disease. Patients with FH with clinical ASCVD or evidence of advanced subclinical ASCVD are also considered to have severe FH.

The most common causes of FH are pathogenic variants of the LDLR gene, which are responsible for 85%-90% of genetically confirmed FH. Early diagnosis in childhood and initiation of therapy is thought to reduce mortality and morbidity. With many causes of hypercholesterolemia and early-onset CAD clouding the differential diagnosis, the condition remains underrecognized; only an estimated 10% of the 1.3 million Americans living with FH have received a diagnosis. Consequently, FH is usually diagnosed in adults after a cardiac event.

Dysbetalipoproteinemia (type III hyperlipidaemia) is a rare condition in which patients typically have elevated total cholesterol (300-600 mg/dL) and triglyceride levels (> 400 mg/dL, but maybe > 1000 mg/dL). It is unlikely in this case because these patients usually have a metabolic disorder, such as diabetes, obesity, or hypothyroidism.

Homozygous autosomal recessive hypercholesterolemia is another molecular defect that causes severely elevated LDL-C. It is a rare form of FH. Seeing as this patient only has one parent with a relevant disease history, it would appear he has heterozygous FH.

Treatment:

Cholesterol-lowering treatments are indicated for patients with FH regardless of genetic test results. Early initiation of intensive LDL-C-lowering treatment is critical to reducing ASCVD morbidity and mortality. FH can usually be sufficiently treated with lipid-lowering therapies, including statins, ezetimibe, bile acid sequestrants, niacin, and PCSK9 inhibitors. However, in patients, 30-75 years of age with an LDL-C level ≥ 100 mg/dL (≥ 2.6 mmol/L) on a maximally tolerated statin and ezetimibe therapy, the addition of a PCSK9 inhibitor may be considered. An LDL-C threshold of 70 mg/dL (1.8 mmol/L) is recommended before the addition of nonstatins to statin therapy. Niacin may also be beneficial for additional LDL-C lowering in some patients with FH who are unable to achieve LDL-C goals despite multidrug treatment regimens.

Summary:

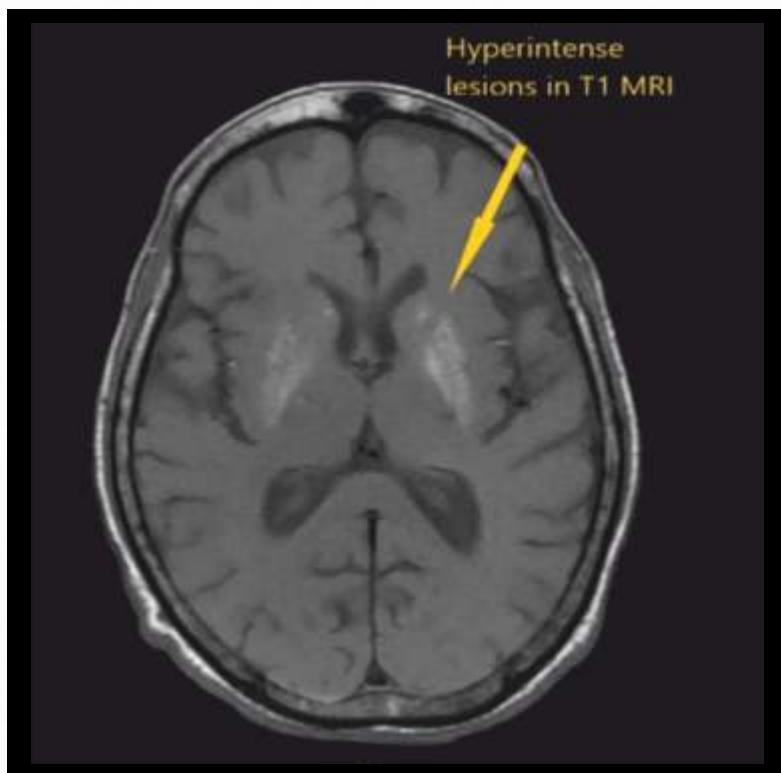
For more severe cases (homozygous FH or severe heterozygous FH with inadequate response to cholesterol-lowering therapies) in which patients cannot achieve LDL-C targets, lipoprotein apheresis may be an option. Selected patients with FH and ASCVD who meet the current US Food and Drug Administration criteria of LDL-C > 100 mg/dL (2.6 mmol/L) after maximally tolerable therapy are candidates for the Dextran Sulfate Low-Density Lipoprotein Adsorption system (LA-15; Kaneka, Osaka, Japan), the only apheresis system available in the United States, for second-line therapy (as either monotherapy or in conjunction with other methods). Moderate exercise and diet modifications are suggested for all patients with FH.

<https://reference.medscape.com/viewarticle/963430>

Case Study: 3

A Case of Chorea: A Rare and Unusual Complication of Hyperglycemia

Case presentation: A 55-year-old female patient presented to the emergency department with complaints of acute onset generalized involuntary choreiform movements for the last five days. It started as bruxism and progressed to involve bilateral upper limbs and left lower limb and was associated with difficulty in speaking. It was noted that the movements resolved while the patient was sleeping. It was not associated with loss of consciousness, bladder or bowel incontinence, or weakness of any body part.



The patient had no history of fever, headache, vomiting, seizures, rash, drug intake, falls, and head injury and has been diagnosed with diabetes for 14 years on irregular treatment with insulin. There was no history of similar illnesses in the family. On examination, the patient was conscious, oriented, with a Glasgow Coma Scale (GCS) score of E4V5M6, blood pressure of 110/70 mmHg, respiratory rate of 20 cycles/min, SpO2 of 96% on room air, and pulse rate of 81 beats/min. The patient's bilateral pupils were reactive and of normal size and the patient had normal vesicular breath sounds. The abdomen was soft and

nontender. Cardiovascular system examination revealed normal heart sounds. Regarding the central nervous system, choreiform movements in bilateral upper limbs and left lower limbs were observed, and the power in all four limbs was 5/5. The tone was normal, and the bilateral plantar were flexor. Cranial nerve examination was normal. Cerebellar signs were absent.

Investigations revealed mild anemia, and other blood tests were within normal limits. Non-contrast computed tomography of the head revealed a tiny calcified granuloma in the right parietal lobe. Magnetic resonance imaging of the brain suggested a hyperintense lesion in the bilateral basal ganglia on T1, indicating a metabolic insult.

Random blood sugar level was 358 mg/dL (19.87 mmol/L) with negative urine ketones and normal arterial blood gas analysis (pH-7.354; pCO2-37.1mmHg; and HCO3-20.9 mmol/L). The patient's glycated hemoglobin (HbA1c) was 10.4%; thus, we made the diagnosis of NKH chorea.

Treatment:

In the emergency department, isotonic saline (0.9% NaCl) at the rate of 10-20 ml/kg and insulin was administered to control blood sugar levels; and haloperidol (5 mg) was intravenously injected to control the involuntary movements of the patient. The patient was discharged with clonazepam (10 mg per tablet) along with insulin (subcutaneous). The patient is now asymptomatic with regular follow-up in the neurology outpatient department.

Discussion:

Chorea, athetosis, and ballism are the involuntary movements of the choreiform spectrum. NKH chorea encompasses a triad of chorea, hyperglycemia, and basal ganglia hyperintensity and is a rare complication of diabetes mellitus.

The underlying pathogenesis of chorea in NKH chorea is attributable to hyperglycemia-induced basal ganglia dysfunction. Hyperglycemia leads to the stimulation of the anaerobic pathway in the brain, leading to Krebs cycle inhibition. The metabolic demand of the brain is fulfilled by converting gamma-aminobutyric acid (GABA) to succinic acid, resulting in metabolic acidosis. In ketotic hyperglycemia, GABA is resynthesized; however, in NKH, both GABA and acetate are severely depleted, resulting in basal ganglia dysfunction. Chorea is also observed in patients with hypoglycemia and rapid correction of hyperglycemia.

One radiological feature of NKH chorea is basal ganglia hyperintensity on T1-weighted MRI. A similar finding was observed in patients with hepatic encephalopathy, hypoglycemic coma, and post-cardiac arrest encephalopathy. Most patients with nonketotic hyperglycemia respond well to the improvement of blood sugar levels; thus, strict blood sugar control is the mainstay of treatment. The other drugs that can treat chorea are dopamine antagonists such as risperidone, haloperidol, and GABA agonists such as clonazepam. NKH is a reversible cause of chorea, which should be timely identified and corrected. Moreover, hyperglycemia is a risk factor for cerebrovascular accidents and can lead to cerebrovascular insufficiency leading to striatum dysfunction, which manifests as chorea.

Conclusions:

NKH chorea is a rare complication of uncontrolled diabetes mellitus and is more commonly seen in elderly females. It is one of the reversible metabolic causes of chorea; timely recognition and appropriate treatment of this condition will improve the patient's quality of life.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8589335/>

Section E: Healthy Living

Why Meditation?

Meditation can wipe away the day's stress, bringing with it inner peace.

It can be difficult at times to keep up with the fast-paced life of modern society. Meditation can provide a sense of calm, peace & balance that can benefit both emotional well-being & overall health.

The emotional benefits of meditation can include:

- Gaining a new perspective on stressful situations
- Building skills to manage your stress
- Increasing self-awareness
- Focusing on the present
- Reducing negative emotions
- Increasing imagination and creativity
- Increasing patience and tolerance

There are only 24 hours in a day, and 7 days in a week - often it seems like not enough time to get everything done that we need to. What about time for ourselves? What about the time we all need to relax our minds and rejuvenate our souls?

There are several ways to maintain mindfulness when in transit between all of life's demands. Let's face it - we're already glued to our smartphones and computer screens. Why not put them to work for us to help carve out that much-needed time.

Meditation allows the mind to relax. When the mind relaxes, the body comes with it. It's quite natural.

Types of meditation

Meditation is an umbrella term for the many ways to a relaxed state of being. There are many types of meditation and relaxation techniques that have meditation components. All share the same goal of achieving inner peace.

Ways to meditate can include:

- **Guided meditation:** Sometimes called guided imagery or visualization, with this method of meditation you form mental images of places or situations you find relaxing.

You try to use as many senses as possible, such as smells, sights, sounds, and textures. You may be led through this process by a guide or teacher.

- **Mantra meditation:** In this type of meditation, you silently repeat a calming word, thought, or phrase to prevent distracting thoughts.
- **Mindfulness meditation:** This type of meditation is based on being mindful or having an increased awareness and acceptance of living in the present moment.

In mindfulness meditation, you broaden your conscious awareness. You focus on what you experience during meditation, such as the flow of your breath. You can observe your thoughts and emotions, but let them pass without judgment.

- **Qi gong:** This practice generally combines meditation, relaxation, physical movement, and breathing exercises to restore and maintain balance. Qi gong (CHEE-gung) is part of traditional Chinese medicine.
- **Tai chi:** This is a form of gentle Chinese martial arts. In tai chi (TIE-CHEE), you perform a self-paced series of postures or movements in a slow, graceful manner while practicing deep breathing.



- **Transcendental Meditation®:** Transcendental Meditation is a simple, natural technique. In Transcendental Meditation, you silently repeat a personally assigned mantra, such as a word, sound, or phrase, in a specific way.

This form of meditation may allow your body to settle into a state of profound rest and relaxation and your mind to achieve a state of inner peace, without needing to use concentration or effort.

- **Yoga:** You perform a series of postures and controlled breathing exercises to promote a more flexible body and a calm mind. As you move through poses that require balance and concentration, you're encouraged to focus less on your busy day and more on the moment.

Elements of meditation

Different types of meditation may include different features to help you meditate. These may vary depending on whose guidance you follow or who's teaching a class. Some of the most common features in meditation include:

- **Focused attention:** Focusing your attention is generally one of the most important elements of meditation.

Focusing your attention is what helps free your mind from the many distractions that cause stress and worry. You can focus your attention on such things as a specific object, an image, a mantra, or even your breathing.

- **Relaxed breathing:** This technique involves deep, even-paced breathing using the diaphragm muscle to expand your lungs. The purpose is to slow your breathing, take in more oxygen, and reduce the use of the shoulder, neck, and upper chest muscles while breathing so that you breathe more efficiently.
- **A quiet setting:** If you're a beginner, practicing meditation may be easier if you're in a quiet spot with few distractions, including no television, radios, or cellphones.

As you get more skilled at meditation, you may be able to do it anywhere, especially in high-stress situations where you benefit the most from meditation, such as a traffic jam, a stressful work meeting, or a long line at the grocery store.

- **A comfortable position:** You can practice meditation whether you're sitting, lying down, walking, or in other positions or activities. Just try to be comfortable so that you can get the most out of your meditation. Aim to keep good posture during meditation.
- **Open attitude:** Let thoughts pass through your mind without judgment.

Building your meditation skills

Don't judge your meditation skills, which may only increase your stress. Meditation takes practice.

Keep in mind, for instance, that it's common for your mind to wander during meditation, no matter how long you've been practicing meditation. If you're meditating to calm your mind and your attention wanders, slowly return to the object, sensation, or movement you're focusing on.

Experiment, and you'll likely find out what types of meditation work best for you and what you enjoy doing. Adapt meditation to your needs at the moment. Remember, there's no right way or wrong way to meditate. What matters is that meditation helps to reduce the stress thus patient feels better overall.

**To know yourself is to be confident.
To be confident is to fearlessly express your potential.**



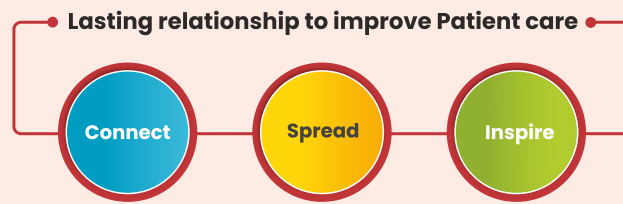
In this Digital World, are you ready to transform for tomorrow?

Our world today is undeniably digital. New technologies – from social media and its implementation is evolving every moment. Digital awareness has become one of the most important skills of the 21st century. And we've every reason to believe that this won't change for some time-perhaps even forever. The speed at which technology is currently progressing forces us to regularly learn new digital skills and techniques. However, an awareness of the digital world can provide much more than just a sense of keeping up with it.

We, at APRICA HEALTHCARE, believe that technological advancement has the potential to bring the prevalence of Global Endemic Diabetes down to a significant level. Thus, to transform the overall look and feel of tomorrow, Aprica has launched a digital application named "APRICA CONNECT" having the aim of building and expanding the awareness of healthcare professionals.

What is APRICA CONNECT?

Aprica Connect is an IOS & android application that creates an awareness video of a doctor in a few minutes. The same can be uploaded on social platforms like Facebook, Instagram, etc. It will help the doctor to communicate his video message to his/her patients/relatives on specific days of the year.



KEY HIGHLIGHTS

5000⁺

Doctor Videos have been created using the APRICA CONNECT application.

9 million⁺

Patients benefited from this initiative so far.

On each Important Health Days, APRICA will shoot a personalized video for you!



Heart day



Stroke day



Diabetes day



Kidney day



Hypertension day



Yoga day



Doctors' day

Share your videos on:

