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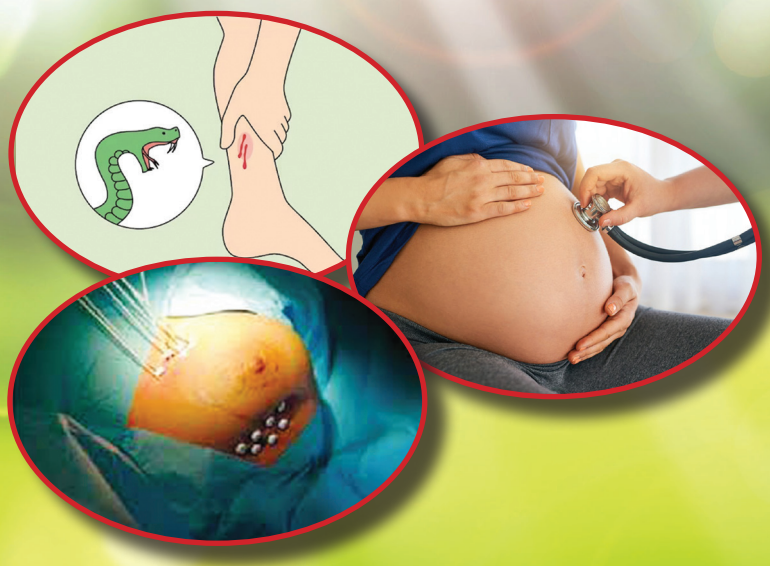

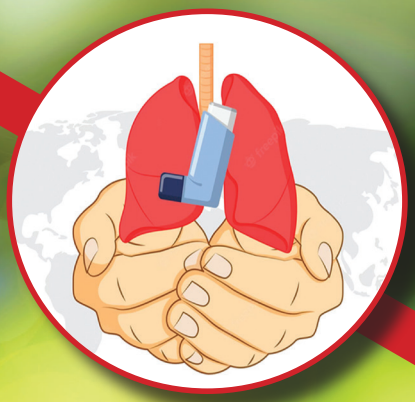

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Email:
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Admin. Office
Blockdale Media LLP
518, Crystal Paradise, Dattaji Salvi Marg, Off Veera Desai Road, Near Janki Centre, Andheri (West), Mumbai-400053. Maharashtra, INDIA.
Tel: 022-46067132 /9820210790 /9867393320
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Impact of Climate Changes on Allergic Diseases

Dr. Manish Maladkar [1]

Abstract

Climate change is a serious global health concern. Longer allergy seasons and worsening air quality are the results of rising temperatures brought on by climate change. Extreme weather events increased exposure to pollen and other allergens, all contributing to worsening allergy and asthma symptoms with a rising prevalence of allergic disorders. Allergic disorders are conditions induced by the immune system's hypersensitivity to normally harmless chemicals known as allergens. Allergic diseases include Allergic Rhinitis (AR), allergic asthma, urticaria, atopic dermatitis, contact allergies, and food allergies. The prevalence of allergic illnesses is rising globally, which is quite concerning. AR is the most common of all atopic diseases, afflicting 10%–30% of adults and up to 40% of children all over the world. The increased prevalence of allergic airway disease worldwide can be partially attributed to those global environmental changes. Climate change and air pollution pose adverse impacts on respiratory allergies. The chronic and recurring nature of AR, which results in poor quality of life and work/school loss despite the fact that it is not a life-threatening condition, poses a serious healthcare challenge.

Keywords: Allergic Rhinitis, Asthma, Climate change, Air pollution

Conflict of Interest: Aristo Pharmaceuticals Private Limited, India

Introduction

In 2005 the first World Allergy Day was celebrated. After much deliberation, it was concluded that additional time was needed to accomplish all of the goals of World Allergy Day, and in 2011 World Allergy Awareness Week was created.

World Allergy Week, a global initiative of the World Allergy Organisation (WAO), is observed this year from June 18 to June 24 to increase public awareness of allergic disorders and other related medical issues. There is also a focus on advocating for the provision of training and resources about diagnosis, management, and ways that certain allergies can be prevented. The theme for World Allergy Week 2023 is 'Climate Change Worsens Allergies. Be Ready.' This year the focus is on managing allergic diseases amidst environmental changes.

Need for Clean Air: Climate Change is Cited as the Cause of Recent Increases in Allergy and Asthma Prevalence

In recent years, it has become increasingly clear how climate change is affecting the environment, biosphere, and biodiversity. Carbon dioxide (CO_2) and other greenhouse gases have become more prevalent in the atmosphere due to human activity. With an increased CO_2 concentration, plant growth is affected in various ways, leading to prolonged pollination periods. Longer warm seasons result in longer pollen seasons and, therefore, longer allergy seasons.[1] The steady increase in global temperatures, resulting from the combustion of fossil fuels and the accumulation of greenhouse gases (GHGs), continues to destabilize all linked to the rising frequency of respiratory allergic diseases and bronchial asthma.[2]

[1] President-Medical & Regulatory Affairs, Dept. of Scientific, Aristo Pharmaceuticals Private Limited, India

Corresponding author: Dr. Manish Maladkar, President-Medical & Regulatory Affairs, Dept. of Scientific, Aristo Pharmaceuticals Private Limited, India. Email: scientific@aristopharma.co.in

The number of airborne pollutants in the environment has increased as a result of climate change. It impacts the air we breathe by increasing the risk that air pollution, including ozone and particle pollution, will worsen. As temperatures increase, warmer air helps to form ground-level ozone, sometimes called smog, which is a powerful air pollutant. Ozone irritates the lungs which may trigger an asthma attack. Asthma and allergy symptoms can be worsened by mold growth, increasing storms, precipitation, flooding, temperatures, and humidity.[3] In addition to having a considerable negative impact on human health and well-being, air pollution and climate change can also cause or aggravate chronic respiratory disorders including asthma and allergic rhinitis.[4]

Burden of Allergic Rhinitis

Allergic rhinitis is a global health problem. It is the sixth most prevalent chronic disease in the world with approximately 1 million people affected each year including up to 40% of the student population.[5] In India, allergic rhinitis has increasingly become more common during the past 20 years. The prevalence of the disease among adults ranges from 20% to 30%. According to an Indian study, allergic rhinitis was prevalent in children between the ages of 6-7 and 13–14, with a frequency of 11.3% and 24.4%, respectively.[6] People of all ages suffer from AR, a common allergic condition that is usually untreated. Because it is often perceived as just a nuisance, many patients do not seek medical treatment, and others self-medicate with over-the-counter products.[7]

Triggers for Allergic Rhinitis

Currently, more than 25% of India's overall population has some kind of allergy sensitivity. The most common triggers include dust mites, insects, animal dander, pollen grains, pollution, and food allergens such as milk, egg, soy, wheat, nut, or fish, prawn, almonds, Baker's yeast, mushroom, ripe mango, rajma, cinnamon, beans, and areca nut. [8,9]

Physical and Mental Symptoms of Allergic Rhinitis

Allergic rhinitis is triggered by various allergens which cause cardinal symptoms such as sneezing, itching, runny nose, and nasal congestion (Table. 1) which is considered as one of the bothersome symptoms causing sleep disturbances. [10,11]

Allergic Rhinitis and Comorbidities: More Than Just a Runny Nose

For both children and adults, AR is more than just sneezing and nose itching. Importantly, AR should be taken into account in the context of systemic allergy illness as it is rarely encountered in isolation. The presence of AR has been associated with numerous comorbid disorders, including asthma, chronic otitis media, rhinosinusitis, oropharyngeal lymphoid hypertrophy, secondary obstructive sleep apnea, and disordered sleep (Figure 1). Poorly controlled AR can trigger exacerbations of these comorbidities because they often share pathophysiologic (inflammatory) pathways in common with AR. Moreover, if left untreated, AR symptoms themselves can worsen, leading to a spiral of worsening comorbidities.[11]

Table 1: Physical and Mental Symptoms of Allergic Rhinitis.

Physical (%)		Mental (%)	
Stuffed –up nose	78%	Feels tired	80%
Runny nose	62%	Feels miserable	65%
Postnasal drip	61%	Feels irritable	64%
Red itching eyes	53%	Depression	36%
Watering eyes	51%	Embarrassment	23%
Repeated sneezing	51%		
Headache	51%		
Nasal itching	46%		
Facial pain	43%		
Ear pain	30%		

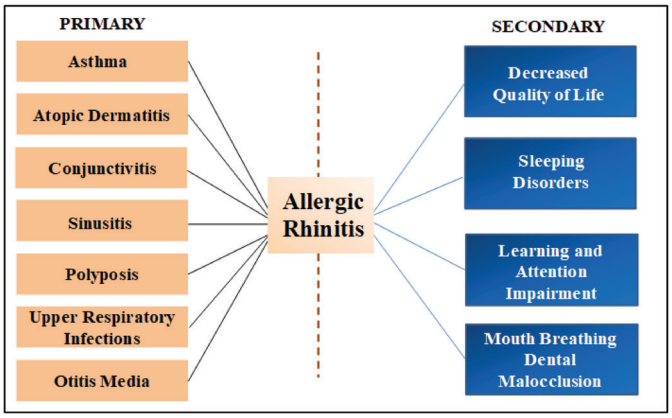

Figure 1. Co-morbidities of Allergic Rhinitis

Double-Trouble: Allergic Rhinitis and Asthma

The increased frequency of allergies and asthma in India has become a significant public health concern, with symptoms ranging from mild rhinitis to severe asthma and even life-threatening anaphylaxis. Patients with AR are three times more likely to develop asthma. The CARAS study, an Indian survey reported the co-morbidity of AR in asthma patients with a high incidence of 65.24%.[12]

Social and Psychological Impact of Allergic Rhinitis

When left uncontrolled, AR becomes the dominant

factor in patients' lives, affecting social life, school, sleep, work, and even mental health. In a study group, 79.5% acknowledged that they felt ashamed to communicate with others due to their annoying symptoms which in turn led to difficulty in mingling with peers leading to social disjunction. Complications of this disease are numerous and can have a significant impact, both physically and psychosocially.[5]

Interventions to Modify Air Pollution and Climate Change [4]

While actions of individual citizens can mitigate air pollution only to a small extent, larger lifestyle changes at the population level mainly result from policy interventions.

Lifestyle Adjustments

Various lifestyle adjustments can mitigate air pollution and climate change and indirectly decrease the onset and progression of respiratory diseases.

- At a local level, greenhouse-gas emissions can be reduced by shifting from private motorized transport to more sustainable modalities, such as public transport, cycling, and walking.
- The transition from fossil fuels to renewable energy sources and the industry's commitment to a full phase-out of coal power are crucial steps on the road to a more ecologically friendly economy.
- Limiting the time spent outdoors during the pollen season (for pollen-allergic patients) and during high-traffic hours or warm days is a reasonable approach.
- Reduce exposures to allergens and air pollutants by staying indoors in air-conditioned environments during air quality alerts and high pollen days.
- If using an air conditioner, be sure to change the filter regularly.
- Wash exposed skin and clothes when returning from outdoors, as pollen can travel on skin and clothes.
- Prevent molds by avoiding damp indoor environments.

Investigations

The key to diagnosing allergic rhinitis is to conduct a comprehensive history, physical and clinical examination.[13] In a patient with suspected AR, the physical examination includes visual assessment for outward signs such as mouth breathing, frequent sniffling or throat clearing, allergic salute or nasal crease. Clinical examination involves anterior rhinoscopy and nasal endoscopy for abnormal secretions, or structural abnormalities. Other assessments include examination of ears, sinus, oropharynx, chest, and skin.

Allergy testing is essential for confirming allergens that trigger rhinitis. Skin-prick testing is considered a reliable method for identifying specific allergic triggers of rhinitis. The use of allergen-specific IgE tests (Blood tests) offers an in vitro measurement of a patient's specific IgE levels against certain allergens and is a reasonable substitute for skin prick testing.

Differentiating Indicators Between the Common Cold and Allergic Rhinitis

AR is a condition affecting the nose. Due to several common symptoms, including sneezing and a runny nose, it is usually mistaken for the common cold. The main difference between the common cold and AR is the duration of symptoms. If the symptom lasts for more than 2 weeks, regardless of the time of the year it should be an indication of a cause other than common cold infection. In addition, the presence of fever, malaise, and sore throat are more indicative of a common cold. In AR patients, the mucus is clear and watery whereas in common cold, mucus is thick yellow or green. The cause of allergic rhinitis is not a virus, in contrast to the common cold. [14]

Non-Allergic Rhinitis [15]

Although the illness is not due to allergies, non-allergic rhinitis is characterized by recurrent or chronic symptoms that are similar to those of allergic rhinitis. Examples of rhinitis include infectious rhinitis (the common cold), vasomotor rhinitis, hormonal rhinitis, specific types of occupational rhinitis, gustatory and drug-induced rhinitis, non-allergic rhinitis with eosinophilia syndrome (NARES). Cigarette smoke, strong odors, and fumes, including perfume, hair spray, other cosmetics, laundry detergents, cleaning products, pool chlorine, car exhaust, and other air pollution are allergens that can cause vasomotor rhinitis. Cooking spices, alcoholic beverages (especially beer and wine), aspirin, and several medications are additional irritants.

Unmet Needs in AR

Many patients are dissatisfied with their treatment because the symptoms are inadequately controlled, they do not want a lengthy treatment for a condition they perceive as non-threatening, and/or they experience unacceptable side effects.[16]

Need for "Tailored" Therapy for Allergic Rhinitis

Allergic Rhinitis therapy should be tailored based on the severity of the disease, co-morbidities, treatment availability and affordability, and the patient's

preference.[16] Treatment requires a stepwise approach that includes allergen avoidance, pharmacotherapy, and possibly immunotherapy.[8] Relieving symptoms and preventing disease progression and its complications are the primary therapeutic objectives for allergic rhinitis.[14]

Current pharmacologic options include oral and intranasal antihistamines, intranasal corticosteroids, oral and intranasal decongestants, oral and intranasal anticholinergics, and leukotriene receptor antagonists. The cornerstones of therapy are second-generation oral antihistamines and intranasal corticosteroids; practice guidelines recommend using intranasal corticosteroids as first-line therapy for moderate to severe allergic rhinitis.[17] Optimal management of rhinitis may improve the symptoms of co-existing asthma especially if it is mild asthma. Combination therapy is indicated in patients with moderate-severe or persistent symptoms of AR. It provides better control over the daytime and night-time symptoms of AR. Also, improves QOL and patient compliance.[18]

Conclusion

Air pollution and climate change have a significant impact on human health and well-being and contribute to the onset and aggravation of allergic rhinitis and asthma among other chronic respiratory diseases. Given the explosive global rise in urbanization, industrial production, aviation, road traffic, etc, the preservation of good air quality will become increasingly challenging. Implementing mitigation strategies to reduce greenhouse gas emissions is critical to prevent further warming of the planet and protect public health. Lifestyle changes, including changes in transportation habits and the use of renewable energy, can help decrease global emissions.

"Don't Stress. As long as you have breath, you're blessed"
- Rumi

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Scientists Target Human Stomach Cells for Diabetes Therapy

Stem cells from the human stomach can be converted into cells that secrete insulin in response to rising blood sugar levels, offering a promising approach to treating diabetes, according to a preclinical study from researchers at Weill Cornell Medicine.

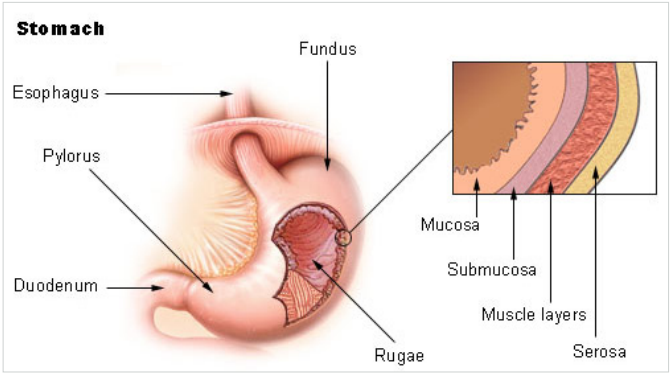
In the study, which appeared April 27 in Nature Cell Biology, the researchers showed that they could take stem cells obtained from human stomach tissue and reprogram them directly -- with strikingly high efficiency -- into cells that closely resemble pancreatic insulin-secreting cells known as beta cells. Transplants of small groups of these cells reversed disease signs in a mouse model of diabetes.

"This is a proof-of-concept study that gives us a solid foundation for developing a treatment, based on patients' own cells, for type 1 diabetes and severe type 2 diabetes," said study senior author Dr. Joe Zhou, a professor of regenerative medicine and a member of the Hartman Institute for Therapeutic Organ Regeneration at Weill Cornell Medicine.

Insulin is a hormone that regulates blood glucose levels -- without it, blood glucose becomes too high, causing diabetes and its many complications. An estimated 1.6 million Americans have type 1 diabetes, which results from an autoimmune attack that destroys beta cells in the pancreas. At least several million other Americans lack sufficient beta cells due to severe type 2 diabetes. Current treatments in such cases include manual and wearable-pump injections of insulin, which have multiple drawbacks including pain, potentially inefficient glucose control, and the necessity of wearing cumbersome equipment.

Biomedical researchers aim to replace beta-cell function in a more natural way, with transplants of human cells that work as beta cells do: automatically sensing blood sugar levels and secreting insulin as needed. Ideally, such transplants would use patients' own cells, to avoid the problem of transplant rejection.

Dr. Zhou has been working toward this goal for more than 15 years. In early experiments as a postdoctoral researcher, he discovered that ordinary pancreatic cells could be turned into insulin-producing beta-like cells by forcing the activation of three transcription factors - or proteins that control gene expression - resulting in the subsequent activation of genes required for the development of normal beta cells. In a 2016 study, again in mice, he and his team showed that certain stem cells in the stomach, called gastric stem cells, are also highly sensitive to this three-factor activation method.



"The stomach makes its own hormone-secreting cells, and stomach cells and pancreatic cells are adjacent in the embryonic stage of development, so in that sense it isn't completely surprising that gastric stem cells can be so readily transformed into beta-like insulin-secreting cells," Dr. Zhou said.

Attempts to reproduce these results using human gastric stem cells, which can be removed from patients relatively easily in an outpatient procedure called endoscopy, were slowed by various technical hurdles. However, in the new study, led by first author Dr.Xiaofeng Huang, an instructor of molecular biology in medicine at Weill Cornell Medicine, the researchers at last achieved success.

After turning human gastric stem cells into beta-like cells, the team grew the cells in small clusters called organoids and found that these organ-like pieces of tissue quickly became sensitive to glucose, responding with secretions of insulin. When transplanted into diabetic mice, the beta-like organoids functioned largely as real pancreatic beta cells would, secreting insulin in response to rises in blood glucose, and thereby keeping blood glucose levels steady. The transplants also kept working for as long as the researchers monitored them six months suggesting good durability.

Dr. Zhou said that he and his lab still need to optimize their method in various ways before it can be considered for clinical use. Necessary improvements include methods to increase the scale of beta-cell production for transplants to humans, and

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modifications of the beta-like cells to make them less vulnerable to the type of immune attack that initially wipes out beta cells in type 1 diabetes patients.

Ultimately, the researchers hope to develop a technique enabling the relatively easy harvesting of gastric stem cells from patients, followed by the transplant, weeks later, of insulin-secreting organoids that regulate blood sugar levels without the need for further medication.

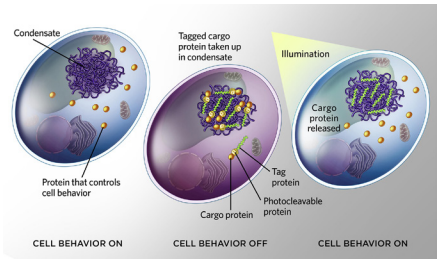
Protein-based Nano-computer Evolves to Influence Cell Behavior

The first protein-based nano-computing agent that functions as a circuit has been created by Penn State researchers. The milestone puts them one step closer to developing next-generation cell-based therapies to treat diseases like diabetes and cancer.

Traditional synthetic biology approaches for cell-based therapies, such as ones that destroy cancer cells or encourage tissue regeneration after injury, rely on the expression or suppression of proteins that produce a desired action within a cell. This approach can take time (for proteins to be expressed and degrade) and cost cellular energy in the process. A team of Penn State College of Medicine and Huck Institutes of the Life Sciences researchers are taking a different approach.

"We're engineering proteins that directly produce a desired action," said Nikolay Dokholyan, G. Thomas Passananti Professor and vice chair for research in the Department of Pharmacology. "Our protein-based devices or nano-computing agents respond directly to stimuli (inputs) and then produce a desired action (outputs)."

In a study published in Science Advances today (May 26) Dokholyan and bioinformatics and genomics doctoral student Jiaxing



Chen describe their approach to creating their nano-computing agent. They engineered a target protein by integrating two sensor domains, or areas that respond to stimuli. In this case, the target protein responds to light and a drug called rapamycin by adjusting its orientation, or position in space.

To test their design, the team introduced their engineered protein into live cells in culture. By exposing the cultured cells to the stimuli, they used equipment to measure changes in cellular orientation after cells were exposed to the sensor domains' stimuli.

Previously, their nano-computing agent required two inputs to produce one output. Now, Chen says there are two possible outputs and the output depends on which order the inputs are received. If rapamycin is detected first, followed by light, the cell will adopt one angle of cell orientation, but if the stimuli are received in a reverse order, then the cell adopts a different orientation angle. Chen says this experimental proof-of-concept opens the door for the development of more complex nano-computing agents.

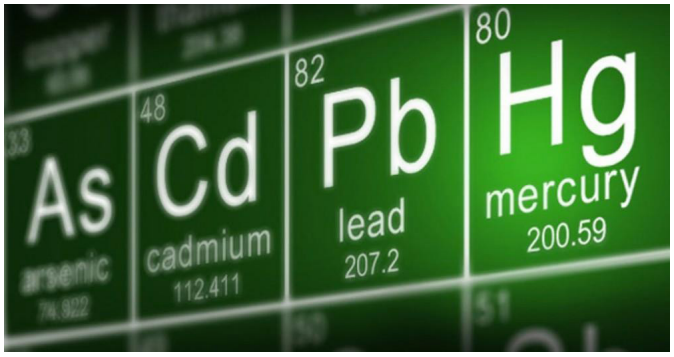
"Theoretically, the more inputs you embed into a nano-computing agent, the more potential outcomes that could result from different combinations," Chen said. "Potential inputs could include physical or chemical stimuli and outputs could include changes in cellular behaviors, such as cell direction, migration, modifying gene expression and immune cell cytotoxicity against cancer cells."

The team plans to further develop their nano-computing agents and experiment with different applications of the technology. Dokholyan, a researcher with Penn State Cancer Institute and Penn State Neuroscience Institute, said their concept could someday form the basis of the next-generation cell-based therapies for various diseases, such as autoimmune diseases, viral infections, diabetes, nerve injury and cancer.

Yashavantha Vishweshwaraiah, Richard Mailman and Erdem Tabdanov of Penn State College of Medicine also contributed to this research. The authors declare no conflicts of interest.

Chronic Exposure to Lead, Cadmium, and Arsenic Increases Risk of Cardiovascular Disease

Chronic exposure to low levels of lead, cadmium and arsenic through commonly used household items, air, water, soil and food is associated with an increased risk of cardiovascular disease, according to a new American Heart Association scientific statement published today in the Journal of the American Heart Association, an open access, peer-reviewed journal of the American Heart Association.



This scientific statement reviews evidence linking chronic exposure to low or moderate levels of three contaminant metals -- lead, cadmium and arsenic to cardiovascular diseases including coronary artery disease, stroke and peripheral artery disease. It highlights clinical and public health implications. Traditional risk factors for cardiovascular disease do not currently include environmental toxicants. The field of environmental cardiology identifies exposure to pollutants including contaminant metals as modifiable risks for cardiovascular disease.

"Large population studies indicate that even low-level exposure to contaminant metals is near-universal and contributes to the burden of cardiovascular disease, especially heart attacks, stroke, disease of the arteries to the legs and premature death from cardiac causes," said Gervasio A. Lamas, M.D., FAHA, chair of the statement writing group and chairman of medicine and chief of the Columbia University Division of Cardiology at Mount Sinai Medical Center in Miami Beach, Florida.

"These metals interfere with essential biological functions and affect most populations on a global scale," said vice chair of the statement writing group Ana Navas-Acien, M.D., Ph.D., a professor of environmental health sciences at Columbia University's Mailman School of Public Health and the director of the Columbia University Northern Plains Superfund Research Program in New York City. "After exposure, lead and cadmium accumulate in the body and remain in bones and organs for decades. In the U.S. alone, one large study suggested that more than 450,000 deaths annually could be attributed to lead exposure."

What are the cardiovascular risks of contaminant metals?

The scientific statement outlines global epidemiologic research confirming that lead, cadmium and arsenic are associated with premature death, due in large part to increased cardiovascular disease risk. The global research includes:

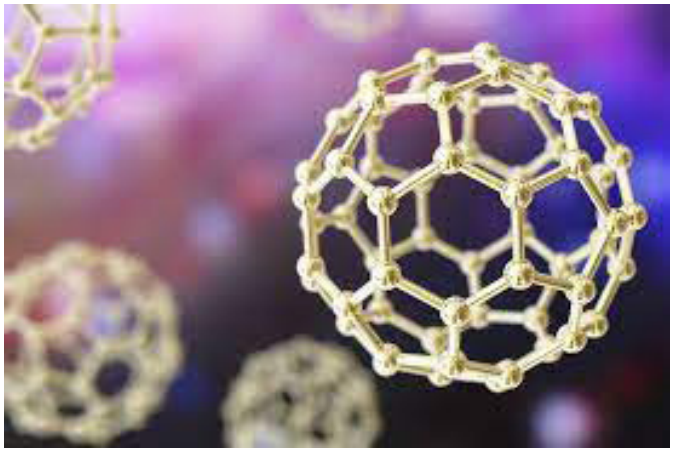
- A 2021 American Heart Association scientific statement recognized exposure to toxic metals as a non-conventional risk factor for peripheral artery disease.
- A 2018 review published in the British Medical Journal assessed 37 studies representing nearly 350,000 people from more than a dozen countries. The review reported that higher urine levels of arsenic and blood levels of lead and cadmium were associated with 15%-85% higher risk for stroke and heart disease.
- One study in China found that higher levels of lead in the blood were associated with carotid plaque in people with Type 2 diabetes. Another found that cadmium and arsenic were associated with a higher rate of heart disease and ischemic stroke.
- In Spain, a general population study found that cadmium in urine was associated with increased rates of newly diagnosed cardiovascular disease.

Single-particle Profiling to Study Nano-sized Particles

Researchers at Karolinska Institutet have created a new method of studying the smallest bioparticles in the body. The study, which is published in Nature Biotechnology, has considerable scientific potential, such as in the development of more effective vaccines.

Circulating around the body are nanoparticles that affect it in one way or another. For example, there are lipoproteins that maintain cell metabolism, pathogenic viruses that cause many diseases, and lipid nanoparticles that are used to carry drugs, like recent lipid nanoparticle-based mRNA vaccines.

However, such particles are too small to be studied easily. To enable this, the researchers in this study have



developed a new method that they call single-particle profiling (SPP).

"We're presenting a new method that gives unprecedented information about nano-sized particles," says the study's last author assistant professor ErdincSezgin at SciLifeLab and the Department of Women's and Children's Health, Karolinska Institutet.

The method makes it possible to measure the content and properties of thousands of particles between 5 and 200 nanometres in size.

"Our method can be used to study bioparticles in health and disease." says Dr Sezgin. "Moreover, it will also be an invaluable tool in creating better and more effective nanocarriers."

One of the researchers' goals was to create a simple, inexpensive method accessible to all researchers.

"We established a method based on commercially available microscopes and made our data-analysis tool and all our data freely available," says Dr Sezgin.

Taurine, Key to Longer and Healthier Life

A deficiency of taurine a nutrient produced in the body and found in many foods is a driver of aging in animals, according to a new study led by Columbia researchers and involving dozens of aging researchers around the world.

The same study also found that taurine supplements can slow down the aging process in worms, mice, and monkeys and can even extend the healthy lifespans of middle-aged mice by up to 12%.

"For the last 25 years, scientists have been trying to find factors that not only let us live longer, but also increase healthspan, the time we remain healthy in our old age," says the study's leader, Vijay Yadav, PhD, assistant professor of genetics & development at Columbia University Vagelos College of Physicians and Surgeons.

"This study suggests that taurine could be an elixir of life within us that helps us live longer and healthier lives."

Anti-aging molecules within us

Over the past two decades, efforts to identify interventions that improve health in old age have intensified as people are living longer and scientists have learned that the aging process can be manipulated.

Many studies have found that various molecules carried through the bloodstream are associated with aging. Less certain is whether these molecules actively direct the aging process or are just passengers going along for the ride. If a molecule is a driver of aging, then restoring its youthful levels would delay aging and increase healthspan, the years we spend in good health.

Taurine first came into Yadav's view during his previous research into osteoporosis that uncovered taurine's role in building bone. Around the same time, other researchers were finding that taurine levels correlated with immune function, obesity, and nervous system functions.

"We realized that if taurine is regulating all these processes that decline with age, maybe taurine levels in the bloodstream affect overall health and lifespan," Yadav says.

Taurine declines with age, supplementation increases lifespan in mice

First, Yadav's team looked at levels of taurine in the bloodstream of mice, monkeys, and people and found that the taurine abundance decreases substantially with age. In people, taurine levels in 60-year-old individuals were only about one-third of those found in 5-year-olds.

"That's when we started to ask if taurine deficiency is a driver of the aging process, and we set up a large experiment with mice," Yadav says.

The researchers started with close to 250 14-month-old female and male mice (about 45 years old in people terms). Every day, the researcher fed half of them a bolus of taurine or a control solution. At the end of the experiment, Yadav and his team found that taurine increased average lifespan by 12% in female mice and 10% in males. For the mice, that meant three to four extra months, equivalent to about seven or eight human years.

At a cellular level, taurine improved many functions that usually decline with age: The supplement decreased the number of "zombie cells" (old cells that should die but instead linger and release harmful substances), increased survival after telomerase deficiency, increased the number of stem cells present in some tissues (which can help tissues heal after injury), improved the performance of mitochondria, reduced DNA damage, and improved the cells' ability to sense nutrients.

Similar health effects of taurine supplements were seen in middle-aged rhesus monkeys, which were given daily taurine supplements for six months. Taurine prevented weight gain, reduced fasting blood glucose and markers of liver damage, increased bone density in the spine and legs, and improved the health of their immune systems.

Doctors' Views on Doctors' Day

Doctors have always played an indispensable role in our lives, tirelessly working to solve all kinds of healthcare issues and striving for better healthcare of our citizens. They empower us to understand our bodies better and guide us toward optimal well-being. On this occasion of Doctors' Day, we, at The Indian Practitioner, would like to convey a crucial message to our esteemed doctors: you are an integral part of our society, and your well-being holds equal importance to that of any other individual. Let us collectively acknowledge the significance of self-care and ensure that our doctors prioritize their own health, just as they dedicate themselves to the welfare of others.

Seeking their valuable insights on National Doctors' Day, The Indian Practitioner requested doctors to share their message:

a) to their fellow doctors
and
b) how to make medical treatment more accessible and affordable, ensuring that the vast majority of Indians, including the middle class and those below the middleclass, are not deprived of quality healthcare.

Dr. G. Anil Krishna, Chairman & Managing Director of Medicover Hospitals (India)

"Let us continue to play our significant part in ensuring wellness and safeguarding the health of the people around us. Let us do it with more passion and commitment, and as thanksgiving to the society and the humanity that helped us become what we are today.Wish you good luck and more opportunities to serve mankind."

"As a country, we face a serious paradox where a majority of our population still lives in rural India, while the healthcare facilities are pathetically limited to cities, that too only a handful of major cities.

With poor infrastructure perpetually plaguing the healthcare and skewed spread of facilities, let us accept that quality and critical healthcare continues to be unaffordable in India. This automatically makes it less accessible and least available to all. At this juncture, I feel it is imperative for government to augment the healthcare facilities evenly across the country. In the long run, if quality competition is visible between the government and the private sectors, the patients will stand to gain on the cost front.

More stress on affordable medical education: A major problem we face is the exorbitant cost of medical education that automatically, though indirectly can burden the cost of quality healthcare. With more medical colleges coming up, this problem can be addressed, to an extent, again in the long run.

Healthcare personnel shortage has to be addressed: A deficit of quality manpower means spending more to get skilled ones from the existing ones. This operational cost is obviously transferred to the end-user as in the industry.

Increase healthcare spend per GDP: This is crucial in terms of the fact that more spendingtranslates to more infra and more scalability. Anything more can bring down the cost.

Awareness of medical insurance: When less than one percent of the population has insurance coverage, the burden of healthcare expenditure can be sharply felt. This segment has to be addressed effectively and we need more players to enter and bring offerings and cost advantage. Also, spread awareness in this aspect"

Dr. Aftab Ahmed, Senior Consultant Physician,Apollo Hospitals, Secunderabad.

"As a doctor, I know firsthand the challenges and rewards of this noble profession. On this Doctors' Day, I want to express my gratitude and admiration for all my fellow physicians who are dedicated to helping others. Our work is not easy, but it is fulfilling and meaningful. We provide hope and healing to our patients, and we make a positive impact on their lives. Let us continue to support and inspire each other."

"India's constitution mandates universal access to healthcare services but our health care system is underfunded, and there are significant shortages of staff and supplies at government facilities. This has resulted in many people seeking care from private providers, which is not always affordable to everyone. The government needs to provide better health insurance, clean water, and check pollution in order

to make basic medical facilities available to everyone, everywhere. Additionally, affordable medicine, free health camps, and free medicines for the poor are welcome. It is also crucial to improve medical facilities in rural areas. To make quality healthcare more accessible and affordable to all, both the government and private sector need to work towards addressing the existing gaps in India's healthcare system."

Dr. Preethika Shetty, Consultant Obstetrician & Gynaecologist, Motherhood Hospitals, Kharadi

"We, doctors are the ones who perform our duties at their best, but we also ensure that we are not only doctors but a friend, a guide, and a shoulder to lean on in difficult times for our patients because we not only believe in treating the patient physically but provide compassion and comfort in their difficult times. As a doctor, our responsibility is to make sure our patients get the right amount of care. It is our duty which lies in providing holistic care for the patients we are catering to. Also, as a doctor, we need to take care of our health both physical and mental through exercise, yoga, meditation, a good sleep routine, staying away from any sort of addiction, and stress management, and at the same time balancing work and family life."

Dr. Duru Shah is Director, Gynaecworld – The Centre for Women's Health and Fertility

"Never lose your cool in difficult times.Empower young girls and women and you will still see the change you want to see in everything around you.You may not always win not because you are not capable, so don't lose heart, instead have faith in your abilities and pursue your passion."

"Health Insurance and staying healthy with a better lifestyle are the solutions to tackle doctor's fees to hospital and diagnostic costs to medicines."

Dr. J Anish Anand, Consultant Internal Medicine, Apollo Hospitals, Jubilee Hills

"We as doctors need to change with time. It's a noble profession but doctors have to learn and improve the art of communication and also look after their health and family life. Stress is a major factor affecting doctors today. They are sandwitched between patient expectations and sometimes administration. Doctors need to adapt to stress and maintain a healthy work-life balance. Also, since the patient-doctor relationship has changed and as an element of suspicion is there, public doctors need to always approach patients in a safe manner to avoid any unnecessary problems with patients which are mostly due to a lack of proper communication and due to a lack of spending time explaining and understanding patient problems."

"Making health insurance compulsory with a basic reasonable limit for all in mohalla clinics with enough medicines like what is happening in Delhi to be set up everywhere. Medicines should be made affordable and subsidized.

Treatment by government schemes like Arogya Sree in private hospitals should be encouraged and cover all diseases, so that no patient is deprived of healthcare. All this is easily possible and needs strong political will with guidance from intellectuals. Unfortunately, health is no more affordable for even the middle class now.

Lastly traditional medicine systems like Ayurveda, yoga should be encouraged. Lifestyle changes like exercise, eating habits, stress control, hygiene, environmental pollution which are at least 80 percent of the cause of health issues should be used as a preventive medicine tool and the public educated on a regular basis."

Dr. Duru Shah, a Revered Individual in the Field of Obstetrics and Gynaecology

Dr. Duru Shah, a revered individual in the field of Obstetrics and Gynaecology, has been dedicating her life to healthcare and the well-being of women. Throughout her extensive career spanning several decades, Dr. Shah's contributions and achievements have left an unforgettable mark on the medical community.

Even as a child, Dr. Shah displayed exceptional discipline and responsibility, harboring a deep passion for learning. She was a diligent student, always aspiring to be at the top of her class. Alongside her academic pursuits, she found joy in various activities such as sports, particularly gymnastics, and engaging in debates. She even experimentedwith poetry writing and had an insatiable curiosity to expand her knowledge in all areas.

Although born into a business-oriented family, Dr. Shah had a profound desire to become a doctor from a very young age. She was inspired by women doctors whom she often came across, and she made the resolute decision to pursue a career in medicine.She met her life partner, Sushil, during her time as a medical student, and together they formed a bond of love and support that would accompany her throughout her professional endeavors.

Education & Career

Having completed her medical education at Grant Medical College, Dr. Shah excelled academically, earning both an MBBS and MD degree. Her insatiable thirst for knowledge and unwavering commitment to excellence resulted in numerous scholarships and awards throughout her educational journey.

Dr. Shah's residency at Cama Hospital presented her with the challenges of balancing the demanding responsibilities of clinical work and nurturing her growing family. With determination and the unwavering support of her husband and mother, she faced these challenges with grace and resilience.

Fuelled by her passion for advancing the field of Obstetrics and Gynaecology, Dr. Shah embarked on a prestigious lectureship at Grant Medical and engaged in research collaborations with esteemed institutions like the National Institute of Research in Reproductive Health, Mumbai Chapter of the Indian Council of Medical Research (ICMR), at Wadia Hospital. These endeavors laid the groundwork for her groundbreaking contributions to the medical community.

In 1985, Dr. Shah's lifelong dream of becoming an honorary Professor of Obstetrics and Gynaecology at Wadia Maternity Hospital, affiliated with Mumbai University, was realized. Her dedication to research, combined with her extensive knowledge and expertise, solidified her reputation as an esteemed professional in her field.

Work-Life Balance

Transitioning into private practice presented Dr. Shah with new challenges, all while raising her cherished daughters. Her commitment to her patients and her innate ability to balance her personal and professional responsibilities propelled her to establish a thriving practice that became a beacon of hope for countless women seeking quality healthcare.

Dr. Shah's unyielding pursuit of excellence continues to inspire generations of healthcare professionals and serves as a powerful reminder of the transformative influence that one dedicated individual can have on the world.

Promoting Reproductive Healthcare

During her tenure as the President of ISAR (Indian Society for Assisted Reproduction), she demonstrated her commitment to advocating for infertility rights and access to treatment. One of her significant achievements was engaging in a constructive dialogue with the Government of India to address the issue of infertility coverage in insurance policies.

Her relentless efforts yielded fruitful results as the Government of India passed a resolution to include

infertility, along with ten other conditions, under insurance coverage.The impact of Dr. Shah's advocacy reverberated through the insurance sector as two of the leading insurance players in India proactively incorporated infertility coverage into their portfolios.

Her leadership has continued to shape the landscape of reproductive healthcare in India, ensuring that individuals and couples receive the support and coverage they deserve in their journey toward parenthood.

Dr. Shah shared with us an interesting case she came across in her career:

"A young woman, SA, aged 25 and married to a doctor, sought my help around 40 years ago due to infertility issues. Surprisingly, she had never experienced menstruation throughout her life. Despite her physical development as a woman, appearing tall, attractive, and intelligent, an examination revealed no abnormalities except for the presence of breast milk secretion. Since hormone assays and ultrasound were not readily accessible at that time, I recalled recent research on a hormone called "Prolactin," which is produced in the brain and can cause breast milk production.

To explore this possibility, I reached out to my colleagues at the NIRRH (National Institute for Research in Reproductive Health) who were conducting a research project on Prolactin. We managed to test her blood for Prolactin levels through their project, and the results were astonishingly high. The first concern that arose was the potential presence of a brain tumor. While CT scans were unavailable at that time, specialized X-rays were used for brain assessment, leading us to identify a small tumor in her brain.

Fortunately, a newly developed drug called "Bromocriptine" was known to reduce Prolactin levels. We arranged for its import from abroad and initiated her treatment. To our immense joy, she experienced her first-ever menstrual period after approximately eight weeks of medication. Subsequently, her Prolactin levels significantly decreased (measured again in the Research Department), and within another eight weeks, she became pregnant. I had the privilege of delivering a healthy baby boy who has grown up, married, and become a parent.

SA continued her therapy for ten years, during which the brain tumor dissolved, as confirmed by a CT scan, which had become available by then. This remarkable case demonstrates the successful management of infertility related to elevated Prolactin levels caused by a brain tumor, utilizing the medication Bromocriptine."

MSSI, Combating Stigma While Nurturing Compassion and Supportive Environment for MS Patients

Sheela Chitnis is an extraordinary woman who embarked on a remarkable journey filled with unexpected challenges. With dreams of a blissful life, Sheela married Mukund in the year 1969. However, shortly after their marriage, Sheela started noticing perplexing behavior from Mukund. At first, she brushed off his clumsiness and apparent avoidance of household responsibilities as typical male behavior. But her frustration reached its peak when Mukund accidentally dropped their infant due to inexplicable actions.

Little did Sheela know that her husband's behavior was a manifestation of an underlying and rare ailment. In January 1977, Mukund was struck by severe illness, making him immobile and confined to bed. Determined to find answers, Sheela sought medical advice from Dr. N.H. Wadia, a reputed Neurologist. It was during this crucial consultation that this baffling ailment was finally identified as Multiple Sclerosis (MS), a term that was unknown to them at that time.

Driven by determination, Sheela wanted to desperately understand her husband's condition and so she proactively joined the prestigious British Council Library to learn more about MS. Immersed in extensive reading and research, she delved into the depths of MS, acquiring deep knowledge about MS, and started cultivating empathy for her husband's condition.

Sheela's unwavering dedication proved to beincredibly valuable, her learning of the disease fostered a stronger connection with her husband. This newfound knowledge brought them closer and provided the steadfast support required to navigate their difficult journey together.

Multiple Sclerosis (MS), a rare disease, emerges as a condition that disrupts the functioning of the Central Nervous System. Its unpredictable and recurrent nature poses significant challenges for individuals affected by it. Since this disease primarily impacts young individuals, potentially resulting in disability,this explains Mukund's clumsiness and inability to focus. These impairments were a direct consequence of his compromised nervous system, robbing him of control over his own body and making even the simplest daily activities a formidable endeavor.

"Myelin" envelops and safeguards the nerve fibers in the brain and spinal cord (CNS), similar to how insulation protects electrical wires. When any portion of this myelin covering is damaged or destroyed, it disrupts and distorts the nerve signals sent to the brain. This disruption is what gives rise to Multiple Sclerosis.

Multiple Sclerosis is one among many rare diseases in India. It is estimated that there are around 450 different types of rare diseases in India.The lack of awareness and the stigma attached to these diseases have created additional difficulties for patients who are affected by them. The exorbitant cost of therapies has led many patients to opt out of treatment altogether. Renowned experts in the healthcare field emphasize that the success of policy measures addressing rare diseases holds immense significance, as it holds the potential to shape the future of countless patients, like Mukund, who find themselves bewildered and stranded while grappling to comprehend their ailments. It is imperative to provide adequate support and resources to individuals navigating through the perplexities of rare diseases, ensuring that they receive the care and understanding they desperately need.

Sheela then connected with Mrs. RehmutFazelbhoy, a social worker, and Mr. Tobaccowala, the Chairman of Voltas, who also shared a keen interest in establishing services specifically tailored for Multiple Sclerosis in India. Together they started the Organization, with Mukund as the first MS patient.

On July 26 1985 with 3 MS Persons, the Multiple Sclerosis Society of India (MSSI)was formally registered in Mumbai with the State Government as a Charitable Society. MSSI offers a range of comprehensive services to support individuals affected by Multiple Sclerosis (MS):

1. Counseling: MSSI provides counseling services to help individuals and their families cope with the emotional and psychological challenges associated

with MS.

2. Home Physiotherapy / Occupational Therapy / Economic Rehabilitation: MSSI facilitates home-based physiotherapy, occupational therapy, and economic rehabilitation programs, empowering individuals to regain independence and enhance their quality of life.
3. Free treatment at Shushrusha Hospital Dadar & Vikhroli: MSSI ensures that patients in need receive free treatment at renowned medical facilities like Shushrusha Hospital in Dadar and Vikhroli.
4. Medical Reimbursements for Needy Patients: MSSI offers financial support by providing medical reimbursements to patients who require assistance with healthcare expenses.
5. Free Medical Camps/Workshops/Seminars: MSSI organizes regular medical camps, workshops, and seminars to disseminate knowledge, raise awareness, and facilitate learning opportunities for individuals, caregivers, and healthcare professionals.
6. Recreational Programs, Picnics, Programs for Caregivers: MSSI recognizes the importance of recreational activities and organizes programs, picnics, and events to promote social engagement and foster a sense of community among MS patients and their caregivers.
7. Mera Sapna - Fulfilling Wishes of MSPs: MSSI's "Mera Sapna" initiative aims to fulfill the dreams and aspirations of individuals living with MS, helping them achieve their goals and experience moments of joy and fulfillment.
8. Free Mobility Aids: MSSI provides essential mobility aids such as wheelchairs, walkers, and diapers free of cost, enabling individuals with MS to navigate their daily lives with increased comfort and mobility.
9. Monthly Groceries for Needy Families: MSSI extends support to economically disadvantaged MS-affected families by providing monthly groceries, alleviating some of their financial burdens, and ensuring they have access to basic necessities.

MSSI actively promotes awareness about Multiple Sclerosis (MS) through various channels:

1. Media & social media: MSSI utilizes traditional media platforms and social media channels to disseminate information, share personal stories, and raise public awareness about MS.
2. MS Walks / Marathons / Bike Rallies: MSSI organizes MS Walks, marathons, and bike rallies to bring people together, raise funds, and generate awareness about MS within the community.
3. Documentaries on MS: MSSI collaborates with filmmakers and production teams to create insightful documentaries that shed light on the experiences of individuals living with MS. These documentaries serve as powerful educational tools to increase awareness and understanding.
4. Distributing Informative Brochures and Pamphlets: MSSI actively distributes informative brochures and pamphlets containing essential information about MS, its symptoms, treatment options, and available support services. This helps in educating the public and reaching out to those who may be affected by or interested in MS.

To improve public knowledge about MS, reduce stigma, and foster a supportive environment for individuals living with the condition.

MSSI, with its headquarters based in Mumbai, operates multiple branches across prominent cities in India, including Delhi, Kolkata, Bangalore, Hyderabad, Pune, Chennai, and Indore.

Despite being 80 years old, Sheela Chitnis, the Chairperson of MSSI, continues to demonstrate unwavering dedication in her efforts to establish MSSI as a pivotal platform for enhancing public knowledge about MS, combating stigma, and nurturing a compassionate and supportive environment for individuals affected by the condition. Her tireless commitment serves as an inspiration to others and reinforces the organization's mission of making a meaningful impact in the lives of those living with MS.

Multiplesclerosis Society of India

Head Office & Mumbai Chapter. 259, Seeta Sadan,Gr. Flr.,Flat No.2, Opp.Gandhi Market,Sion Road (W), Mumbai-400022

Tel:24037390/7399

E-mail:mssimumbai@gmail.com

Website:www.mssocietyindia.org/ www.msif.org

Creating Better Insight into Asthma Management

Dr. Ravindran Chetambath[1], Dr. Rameesa Shanavas[2]

Abstract

Asthma is a common disease affecting all age groups. Global Initiative for Asthma is preparing and updating asthma management guidelines regularly. This is to make medical practitioners aware of the importance of early diagnosis and optimal management of asthma. The main factor that creates suffering for asthma patients is undertreatment. This may be from the side of the practitioner in the form of delay in diagnosis and failure to use optimal medications. This article focuses on creating awareness among caregivers regarding the selection of optimal management for their asthma patients.

Keywords: World Asthma Day, Optimal management, Targeted therapy, Asthma Care for All

Introduction

World Asthma Day is celebrated across the Globe in May every year. Global Initiative for Asthma (GINA) has chosen "Asthma Care for All" as the theme for the 2023 World Asthma Day. This is for a multi-faceted collaboration for improvement in all aspects of asthma care, for patients and practitioners.

Asthma is a common concern, and according to WHO, more than 260 million people had asthma in 2019, and it caused over 460,000 deaths. The death rate from asthma has nearly doubled since the 1980s.

Multiple factors at play create suffering for an asthma patient. The main factor is undertreatment. This may be from the side of the practitioner in the form of delay in diagnosis and failure to use optimal medications. This may also be from the side of the patients due to poor health-seeking behavior and non-compliance.

The known aggravators of asthma are many and include allergens, air pollution, and other chemicals that can appear in the environment that irritate the lungs. In high enough concentrations, these factors can cause serious asthma attacks in sufferers and can aggravate cases that are otherwise mild.

Asthma Care for All

"Asthma care for all" is intended in providing standard treatment for asthma patients in optimal dosages. We know definitely that asthma is not a curable disease. But it can be well controlled. Most of the patients were not told about what is control and how to maintain control. Patients suffering from asthma get good control if they adhere to the standard treatment. Standard treatment is using the optimal dose of inhaled corticosteroids for a sufficiently long period with 3 monthly follow up to assess control. It is seen that intermittent asthma (Step-1) is taken lightly by the patients and practitioners because symptoms are controlled easily and the patient remains normal till the next episode. We propose that this is the step at which good overall control of airway inflammation can be achieved and asthma relapse can be prevented. Earlier,

[1] Senior Consultant & Chief of Medical Services, Department of Pulmonology, Baby Memorial Hospital, Calicut, Kerala
[2] Resident Trainee, Department of Pulmonology, Baby Memorial Hospital, Calicut, Kerala
Corresponding author: Dr. Ravindran Chetambath, Senior Consultant & Chief of Medical Services, Department of Pulmonology, Baby Memorial Hospital, Calicut, Kerala. Email: crcalicut@gmail.com

Step-1 asthma was treated by as-needed short-acting beta-agonists (SABA). This in effect leads to progression to Step-2, as inflammation was not addressed by SABA. Step-2 asthma is a mild persistent stage where airway remodeling has been initiated which is not completely amenable to anti-inflammatory agents. Hence the best step to initiate inhaled corticosteroid is Step-1. GINA in its 2019 guidelines recommended rescue medication with long-acting beta agonist (LABA) and inhaled corticosteroids (ICS) for Step-1 asthma. This is proposed to control symptoms with LABA and inflammation with ICS. For safety, GINA no longer recommends SABA-only treatment for Step 1 in adults and adolescents. This decision was based on evidence that SABA-only treatment increases the risk of severe exacerbations, and that adding any ICS significantly reduces the risk. GINA now recommends that all adults and adolescents with asthma should receive ICS-containing controller treatment, to reduce the risk of serious exacerbations. The ICS can be delivered by regular daily treatment or, on an as-needed basis.

In the AIRE study [1], 22% of the 2803 adult patients from Western Europe had intermittent asthma and 19% mild persistent asthma based on GINA criteria. Fifty-five percent of intermittent asthma patients claimed to be fully controlled, 36% well controlled, and 9% poorly controlled, compared with 21%, 56%, and 23% respectively in the case of persistent mild asthma patients. Only 30% of persistent mild asthma patients were under daily controller treatment.[2] In another study among children, authors observed that 54% of the children presented with intermittent asthma and 18% with mild persistent asthma, and asthma control was insufficient in 8% and 25% of the children suffering from intermittent and mild persistent asthma, respectively. This study also highlighted parents' underestimation of the severity.

Apart from optimal drug delivery, proper environmental control is needed for each patient. This is achieved by avoiding exposure to triggers. Triggers are indoor as well as outdoor agents. Proper upkeep of living rooms and bedrooms is to be ensured for a patient with asthma or allergy. Cotton dust, paper dust, house dust, and molds are the main indoor allergens, apart from pets.

Outdoor allergens are pollens, fungi, environmental dust, and fumes. Diesel exhaust and occupational agents. During every clinic visit patient should be counseled about how to control his/her environment. In my practice, I have found this to be very useful along with medication for proper control of asthma.

Serious Events

Patients with apparently mild asthma are still at risk of serious adverse events, 30–37% of adults presenting with acute asthma,16% of patients developing near-fatal asthma, and 15–20% of adults dying of asthma; had had symptoms less than weekly in previous 3 months.[3] Regular use of SABA, even for 1–2 weeks, is associated with adverse effects due to b-receptor downregulation, decreased broncho-protection, rebound hyperresponsiveness, and decreased bronchodilator response.[4,5] In the study by Salmeron *et al* [6] of 4087 emergency admissions for acute asthma found 30% of patients could be considered mild asthma cases (less than one symptom per week over the three previous months), and 53% without ICS therapy. Mitchell *et al* [7] defined three populations of asthmatic patients:

1) near-fatal acute asthma,
2) emergency admission for acute asthma, and
3) out-patients

37% of the 197 patients admitted to the emergency department for acute asthma were considered to be suffering from mild asthma.

It is known that about 5% of asthmatics have poorly controlled asthma or severe asthma. This cluster has some factors that may adversely affect proper control. Allergic rhinitis, sinusitis, gastroesophageal reflux disease, occupational factors, and living in an environment exposed to allergens, are all factors affecting good control. Addressing these issues is of prime importance for effective control. For example, a patient suffering from allergic rhinitis if treated for asthma alone will not show much response. Here we have to properly address allergic rhinitis. Proper control of allergic rhinitis will help in controlling asthma easily. These issues are often ignored while treating an asthma patient.

Targeted Therapy

We know that asthma management is now based on targeted therapy looking for specific molecular targets and addressing the same. This is accomplished by anti-IgE antibodies, anti-IL4R, anti-IL5, anti-IL5R, etc. These treatments are effective only in a small percentage of patients. More they are costly drugs and all patients cannot afford to accept this treatment. Early initiation of ICS controls most asthmatics, thus limiting the role of molecular drugs in the majority. The

most important aspect to be considered is permanent low-dose ICS therapy is the reference treatment for intermittent and persistent mild asthma. Effectiveness is to be reassessed at 3 months, and if it is insufficient the patient is no longer considered mildly asthmatic, and treatment has to be stepped up. As mild asthma is the most frequent form of the disease, diagnosis, and management require physicians' particular attention [1].

Conclusion

For better outcomes ICS containing regimen should be initiated as soon as asthma is diagnosed, irrespective of its severity. This is because even mild asthma can have severe exacerbations or mortality risks. Low-dose ICS markedly improves bronchial inflammation and reduces exacerbations. If the initial asthma presentation is with severe symptoms, use a short course of oral steroids to control symptoms and initiate long-term ICS. Better environmental control and treatment of accompanying comorbidities may help to achieve early control and long-term maintenance. Every year World Asthma Day is celebrated to create better awareness of asthma control among patients and their caregivers.

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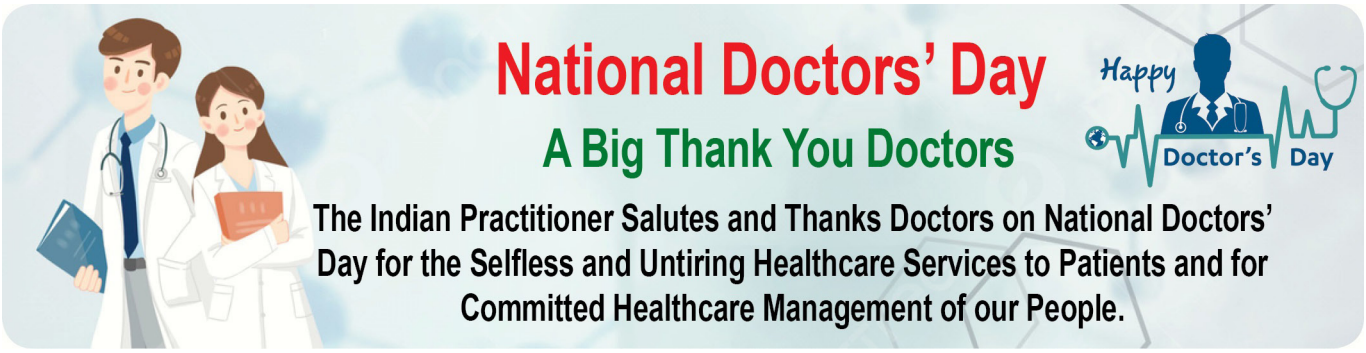

Snake Bite - Current Management Perspective and Brief Review

Dr. Felin Ann Francis[1], Dr. Nivedita Moulick[2], Dr. Harshit Thole[3]

Abstract

A snake bite is an acute life-threatening and time-limiting medical emergency. It is a preventable health hazard often faced by rural populations in tropical and sub-tropical countries with heavy rainfall and humid climate. In India, snake bite is included in a list of neglected tropical diseases. With its triad of high mortality, high disability, and substantial psychological morbidity, snake bite warrants high-priority research.The number of snake bite deaths is greatest in the states of Uttar Pradesh, Andhra Pradesh, and Bihar, and snake bites are more common in rural communities. Currently, treatment quality is highly varied, ranging from good quality in some areas, to very poor quality in other areas.Our article aims to sensitize clinicians regarding different types of snake bite, their clinical features, and the use of anti-snakebite venom (ASV), for better patient management and improved prognosis.

Keywords: **Snakebite, Diagnosis, ASV, Treatment.**

Introduction

Worldwide, snake bites contribute to as many as 1.8 million envenomations and 94,000 deaths every year.[1] In India, there are about 45,900 snake bite deaths every year (annual age-standardized rate of 4.1/100,000).[2]

There are more than 2000 species of snakes in the world. About 300 species are found in India, out of which 52 are venomous. The venomous snakes found in India belong to 3 families- Elapidae, Viperidae, and Hydrophinae (Sea Snakes). The most common Indian Elapids are Najanaja (Indian Cobra), Bungarus caeruleus (Indian Krait), Daboia russalie (Russell's Viper), and Echiscariatus (Saw scaled viper).[3]

Kraits are active during night hours, often biting a person sleeping on the floor bed. Maximum Viper and Cobra bites occur during the day or early darkness while watering the plantation or walking barefoot in grown grass or soybean crops.

Victims are not only misdiagnosed as abdominal colic and vomiting due to indigestion, appendicitis,stroke, head injury, ischemic heart disease, food poisoning, trismus, hysteria, and Guillain barre syndrome (GBS)but also subjected to unnecessary investigations including MRI scans of the brain and lumbar puncture (LP), thus causing undue delay in Anti Snake Venomtherapy (ASV). Delayed administration of ASV or waiting until the victim develops systemic manifestation i.e., a 6-hour results in systemic envenoming and high fatality.[4]

Clinical Features

Clinical presentation of snake bite victim depends upon- the species of snake, the amount of venom

[1]Assistant Professor Department of General Medicine, D Y Patil Medical College, Nerul, Navi Mumbai.
[2] Professor & HOD Department of General Medicine, D Y Patil Medical College, Nerul, Navi Mumbai.
[3]Assistant Professor Department of General Medicine, D Y Patil Medical College, Nerul, Navi Mumbai.
Corresponding Author: Dr. Felin Ann Francis, Assistant Professor Department of General Medicine, D Y Patil MedicalCollege, Nerul, Navi Mumbai. **Email**: felinfrancis18@gmail.com

injected, the season of bite, whether the snake is fed or unfed, the site of the bite, the area covered or uncovered, dry or incomplete bite, multiple bites, the weight of the victim, time elapsed between bite and administration of ASV. Venom concentration and constitution depend on environmental conditions as well as the snake's maturity and darkness of colour of skin.[5,6] Patients attimes present with non-specific symptoms related to anxiety. Common symptoms in these patients are palpitations, sweating, tremulousness, tachycardia, tachypnoea, elevated blood pressure, cold extremities, and paraesthesia (pins and needles pricking sensation of extremities). These patients may have dilated pupils suggestive of sympathetic overactivity. Others may develop vasovagal shock (faintness and collapse with profound slowing of the heart) after the bite or suspected bite.

Patients can present in 4 clinical syndromes or combinations i.e., progressive weakness (neuroparalytic /neurotoxic), bleeding(vasculogenic/ haemotoxic), myotoxic, and painful progressive swelling.

Dry bite-bites by non-venomous snakes are common and bites by venomous species are not always accompanied by injection of venom (dry bites). The percentage of dry bites ranges from 10-80% for various venomous snakes.

Local swelling, bleeding, blistering, and necrosis suggest Cobra bite. Minimum local changes indicate Krait bite. Local bleeding suggests Nilgiri Russel's viper. Pain in the abdomen and hyperperistalsis indicates a Krait bite. Even in the case of a dry bite, symptoms due to anxiety and sympathetic over-activity may be present. As symptoms associated with panic or stress sometimes mimic early envenoming symptoms, clinicians may have difficulty in determining whether envenoming occurred or not.

Neuroparalytic (Progressive weakness; Elapid envenomation) Neuroparalytic snakebite patients present with typical symptoms within 30 min– 6 hours in case of a Cobra bite. Many species, particularly the Krait and the humpnosed pit viper are known for delayed appearance of symptoms which can develop after 6–12 hours;however, ptosis in Krait bite has been recorded as late as 36 hours after hospitalization. Chronological order of appearance of symptoms – furrowing of forehead, Ptosis (drooping of eyelids) occurs first, followed by Diplopia (double vision), Dysarthria (speech difficulty), then Dysphonia (pitch of voice becomes less)followed by Dyspnoea (breathlessness) and Dysphagia (Inability to swallow) occurs. All these symptoms are related to 3rd, 4th, 6th, and lower cranial nerve paralysis. Finally, paralysis of intercostal and skeletal muscles occurs in descending manner-Descending palsy.

To identify impending respiratory failure, bedside lung function tests in adults –

i. Single breath count – number of digits counted in one exhalation - normal >30

ii. Breath holding time – breath held in inspiration – normal > 45 sec

iii. Ability to complete one sentence in one breath.

Cry in a child whether loud or husky can help in identifying impending respiratory failure.

Locked-in syndrome (LIS) is defined as quadriplegia and anarthria with preserved consciousness. Patients retain vertical eye movement, facilitating non-verbal communication. In completeLIS patients cannot communicate in any form. Central LIS is seen commonly due to lesions in the ventral pons [7,8,9]. Peripheral LIS usually occurs in Elapidae bites, especially Krait bites and hence increasing one's suspicion rate is important as they can be referred to a centre with ventilator support.

Occult snakebite: Krait bites victims often present in the early morning with paralysis with no local signs with no bite marks. Snakebite victim gets up in the morning with severe epigastric/umbilical pain with vomiting persisting for 3 – 4 hours and followed by typical neuroparalytic symptoms within the next 4- 6 hours. There is no history of snakebite. Unexplained respiratory distress in children in the presence of ptosis or sudden onset of acute flaccid paralysis in a child (locked-in syndrome) is a highly suspicious symptom in endemic areas, particularly of Krait bite envenomation.

Vasculotoxic / Hematotoxic / Bleeding

Vasculotoxic bites are due to Viper species. They can have local manifestations as well as systemic manifestations.

Local manifestations: These are more prominent in Russel's viper bite followed by Saw scaled viper and least in Pit viper bite. Local manifestations are in the form of: - Local swelling, bleeding, blistering, and necrosis. Pain at the bite site and severe swelling leading to compartment syndrome. Pain on passive movement. The absence of peripheral pulses and hypoesthesia over the fuels of nerve passing through the compartment helps to diagnose compartment syndrome. Tender enlargement of the local draining lymph node.Visible systemic bleeding from the action of haemorrhagese.g.,

gingival bleeding, epistaxis, ecchymotic patches, vomiting, hematemesis, hemoptysis, bleeding per rectum, subconjunctival haemorrhages, continuous bleeding from the bite site, bleeding from pre-existing conditions e.g.,haemorrhoids, bleeding from freshly healed wounds. Acute abdominal tenderness may suggest gastrointestinal or retroperitoneal bleeding. Lateralizing neurological symptoms such as asymmetrical pupils may be indicative of intracranial bleeding. Consumption coagulopathy detectable by 20 minutes whole blood clottingtime (20 WBCT) develops as early as within 30 minutes from the time of bite but may be delayed.

Some species e.g., Russell's viper frequently cause acute Kidney Injury. The patient presents with bilateral renal angle tenderness, albuminuria, hematuria, hemoglobinuria, and myoglobinuria followed by oliguria and anuria with acute kidney injury (AKI)

Manifestations like parotid swelling, conjunctival chemosis, myalgia, thirst and systemic hypotension observed in patients of Daboia russelii bite indicate capillary leak syndrome. It is seen more commonly in males as compared to females. Hemoconcentration, increased HCT, leukocytosis, and pleural effusion are early laboratory and radiological markers of capillary leak syndrome and should alert the clinician to seek urgent interventions in Daboia russelii bite.

Myotoxic

This presentation is common in Sea snakebite. The patient presents with Muscle aches, muscle swelling, and involuntary contractions of muscles. Passage of dark brown urine. Compartment syndrome, cardiac arrhythmias due tohyperkalemia, acute kidney injury due to myoglobinuria, and subtle neuroparalytic signs.

Check the history of snakebite and look for obvious evidence of a bite (fang puncture marks, bleeding, swelling of the bitten part etc.). However, ina krait bite(Neuroparalytic snakebite)no local marks may be seen. It can be noted by magnifying the lens as a pinhead bleeding spot with a surrounding rash.

Examine the bite site and look for fang marks or any signs of local envenomation. Fang mark or their patterns have no role to determine whether the biting species was venomous or non-venomous or the amount of venom injected, the severity of systemic poisoning and the nature of poisoning – Elapidae or Viperidae venom etc. Some species like Krait may leave no bite marks.

Investigations

Bedside 20 WBCT: If the blood is solid i.e., has clotted the patient has passed thecoagulation test and no ASV is required at this stage. 20 WBCT may remain negative (clotting) in patients with evolving venom–induced DIC, therefore, the patient is re-tested every hour for the first three hours and then 6 hourly for 24 hours until either test result is not clotted or clinical evidence of envenomation to ascertain if a dose of ASV is indicated.

In case of neurotoxic envenomation repeat the clotting test after 6 hours. (Expert Consensus).

The first blood drawn from the patient should be typed and cross-matched, as the effects of both venom and ASV can interfere with later cross-matching.

White blood cell count: An early neutrophil leucocytosis isevidence of systemic envenoming from any species.

Treatment

Immobilize the limb in the same way as a fractured limb (Apply a splint extending to the entire length of the limb, immobilizing all of the joints of the limb) in the recovery position. If a victim is expected to reach the hospital in more than 30 minutes but less than 3 hours, 2crepe bandages may be applied by qualified medical personnel only till the patient is shifted to the hospital. The bandage is wrapped over the bitten area as well as the entire limb with the limb placed in a splint. Application of a tourniquet is notrecommended since the risk of arterial compressionand subsequent gangrene with a tight tourniquet is high.[10]

Anti Snake Venom

If ASV is indicated i.e., signs and symptoms of envenomation with or without evidence of any test report. In a patient with a history of bites; known or unknown, if there is spontaneous abnormal bleeding beyond 20 minutes from the time of bite- start ASV, and do NOT wait for 20 WBCT reports.If there are no signs of systemic or severe local envenomation, it is advisable to monitor the patient for 24 hours and repeat a whole blood clotting time before discharge.[10,11]

Administration of Anti Snake Venom

The dose of ASV to be administered to a personis one of the biggest controversies in the management of snake bite envenomation. The regimens and dose of ASV according to accepted guidelines are given below.[10,12,13]

Purely local swelling, even if accompanied by a bite mark from a venomous snake, is not a ground for administering ASV. Swelling, several hours old is also not a ground for giving ASV. However, the

rapid development of swelling indicates bite with envenoming requiring ASV.

In the presence of coagulopathy, Polyvalent ASV freeze-dried (heat stable; to be stored at a cool temperature; shelf life 3-5years) or neat liquid ASV (heat labile; ready to use; requires reliable cold chain (2-8 degrees C and NOT frozen) with a refrigeration shelf life of 2 years but costlier) whichever isavailable may be used before the expiry date. If the integrity of the cold chain is not guaranteed, the use of lyophilized ASV is preferred. Reconstitute ASV supplied in dry powder form by diluting in 10 ml of distilledwater/ normal saline. Mixing is done by swirling and not by vigorous shaking. Caution: Do not use, if the reconstituted solution is opaqueto any extent.

Dose of ASV for Neuroparalytic Snakebite

ASV 10 vials stat as an infusion over 30 minutes followed by 2nd dose of 10 vials after 1 hour if no improvement within 1st hour.

The maximum dose is 20 vials of ASV for neuro toxically envenomed patients.

Vasculotoxic

Low-dose infusion therapy is as effective as high-dose intermittent bolus therapy and also saves scarce ASV doses.

Low Dose infusion therapy: 10 vials for Russel's viper or 6 vials for Saw scaled viper as a stat as an infusion over 30 minutes followed by 2 vials every 6 hours as an infusion in 100 ml of normal saline till clotting time normalizes or for 3 days whichever is earlier. OR

High dose intermittent bolus therapy - 10 vials of polyvalent ASV stat over 30 minutes as an infusion, followed by 6 vials 6 hourly as bolus therapy till clotting time normalizes and/or local swelling subsides. No ASV for Sea snakebite, confirmed Green Pit snakebite even if with signs of envenomation as available ASV do not contain antibodies against them.

If large doses have been administered and the coagulation abnormality persists, give fresh frozen plasma (FFP) or cryoprecipitate (fibrinogen, factor VIII), or give fresh whole blood, if both FFP and cryoprecipitate are not available.

Give prophylactic epinephrine 0.25 mg of 0.1% solution by subcutaneous injection, except in known hypertensive or patients with cardiovascular disease, and draw Epinephrine (adrenaline) in readiness in two syringes before ASV is administered. Observe all patients every 5 min for the first 30 min, then at 15 min for 2 hours for the manifestation of a reaction. At the earliest sign of an adverse reaction suspend treatment. Pregnant women are treated in the same way as other victims. The same dosage of ASV is given.Children also are given the same dose of ASV as adults as snakes inject the same amount of venom into children and adults. However, reduce the amount of fluid in the running bottle to 200 ml to avoid fluid overload.

The range of venom injected is 5 mg-147 mg. The total required dose range is between 10 and 30 vials as each vial neutralizes 6 mg of Russell's Viper venom.

ASV is the most allergic drug known to humankind and about 20% will develop an allergic reaction [10,14]. In our experience as many as 1/3rd of the patientsdevelops a hypersensitivity reaction. These allergic reactions may develop early (within a few minutes to 3 hours) or late (1-12 days). It is important therefore to be aware of this problem and observe the patient closely. Intradermal testing for hypersensitivity reaction before giving ASV is not recommended.

Late Serum Sickness-Type Reactions

This may develop 1-12 days (mean 7 days) after administration of ASV and is characterized by fever, nausea, vomiting, arthralgia, arthritis, itching, diarrhea, myalgia, lymphadenopathy, proteinuria, neuritis, and occasionally encephalopathy. Most respond to oral antihistamines like chlorpheniramine maleate. Those who do not respond to treatment after 2 days should be given a 5-day course of prednisolone (5 mg every 6 hours for adults) [10,15]

Injection Atropine 0.6 mg followed by neostigmine (1.5mg) IV stat (In children Inj. Atropine 0.05 mg/kg followed by Inj. Neostigmine 0.04 mg/kg IV). Repeat neostigmine 0.5 mg (in children 0.01mg/kg) with atropine every 30 minutes for 5 doses. Thereafter, taper dose at 1 hour, 2 hours, 6 hours and 12 hours. A positive response is measured as 50% or more recovery of the ptosis in one hour. If no response after 3rd dose stops the Atropine injection. No Atropine injection in confirmed krait bite.

In case of a clinically confirmed venomous bite, remove the tourniquet only after starting of loading dose of ASV and keep the Atropine Neostigmine injection ready.

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Sickle Cell Disease and Pregnancy

Dr. Reena J. Wani[1], Dr. Mahin Bhatt[2]

Abstract

Sickle cell disease is caused by a mutation in the beta-globin gene, leading to the formation of abnormal haemoglobin and various complications. Managing this condition during pregnancy requires a collaborative approach, involving close follow-up, patient education, and active patient involvement. The process begins with pre-conception genetic counselling and assessing the patient's baseline health. If the disease is uncontrolled or if the patient has kidney disease, hypertension, or frequent vaso-occlusive crises, pregnancy may need to be delayed or alternative reproductive options considered. The use of hydroxyurea during pregnancy is a subject of debate and is determined on a case-by-case basis. High-dose folic acid supplementation is recommended before and during pregnancy. Medications should be carefully reviewed, and any potentially harmful drugs to the fetus should be discontinued. Low-dose aspirin and adequate hydration are used to prevent hypertensive and vaso-occlusive crises, respectively. Severe anaemia may require a blood transfusion, but haemoglobin levels are maintained below 10g/dl to prevent increased blood viscosity. Vaginal delivery can be safely performed with appropriate measures such as hydration, warmth, and nasal oxygen. Cesarean sections are reserved for obstetric indications..

Keywords: Sickle Cell Disease, Pregnancy, Vaso-occlusive crises, Anemia, Hydroxyurea, Delivery

Introduction

Sickle cell disease (SCD) is a group of disorders that despite being common knowledge in the medical field, is often a cause of confusion and concern among clinicians, especially those in primary care with lim-ited awareness of the interaction of this complex condition with other physiologic states and diseases. As we approach World Sickle Cell Day, we must disseminate knowledge and the latest clinical guidelines concerning its management, especially in the already challenging state of pregnancy.

SCD refers to both Sickle Cell Anemia and Sickle Cell Trait. Both are caused by an autosomal recessive in-heritance of a point mutation at the seventh codon of the Beta globin gene (HBB). This leads to glutamate being replaced by the non-polar amino acid, valine. This small biochemical alteration leads to the formation of HbS, a less soluble, crystallizable form of haemoglobin, leading to all the varied manifestations.

Sickle cell anaemia is the virulent version in which patients who are homozygous for the mutated gene, have almost 90% of haemoglobin as HbS. In contrast, individuals with the asymptomatic carrier state, Sickle cell trait, have around 40% HbS, with a minor risk for thromboembolic and renal effects.[1]

Genetics of SCD

SCD arises from a point mutation in the HBB, Beta Globin gene on chromosome 11.

Apart from the inheritance of 1 or 2 mutated alleles, a variety of factors affect the phenotype.

A major contributor is other mutations in the HBB

[1] Professor and Head, Department of Obstetrics and Gynaecology, H. B. T. Medical College and Dr. R. N. Cooper Municipal General Hospital, Mumbai
[2] Research Associate, H. B. T. Medical College, and Dr. R. N. Cooper Municipal General Hospital, Mumbai

Corresponding author: Dr. Reena J. Wani, Professor and Head, Department of Obstetrics and Gy-naecology, H. B. T. Medical College and Dr. R. N. Cooper Municipal General Hospital, Mumbai. Email: reenajwani@gmail.com

gene at other loci. For example, co-inheritance of beta thalassemia trait, HbC, or other rare mutations that render the HbS more or less susceptible to sickling. Such patients have an approximate HbS value >50%.

Other modifier genes like the alpha globin gene, HbF gene, and PLKR genes play a role in the phenotypic variation. As evidenced by the indirect reduction of sickling by alpha thalassemia traits as there is a reduced corpuscular haemoglobin concentration. Conversely, the PLKR variants seen in people of African descent, lead to painful crises even in the ideally asymptomatic Sickle cell trait patients.

Evolutionary Biology of SCD

In 1949, J. B. S. Haldane hypothesized that hemoglobinopathies with their higher prevalence in the tropics were borne of natural selection as a result of the high endemicity of malaria. This was soon confirmed to be true in the latter half of the twentieth century when it was realized that the Sickle cell trait and other mild hemoglobinopathies, protected individuals against malaria, most importantly, P. falciparum.[11]

Restriction endonuclease studies have shown that the Sickle mutation in the HBB gene arose around 5000-7000 years ago in western and central Africa around present-day Cameroon and Angola, with small-er populations in the Middle East and South Asia. P falciparum has plagued these areas for over 100,000 years with a massive explosion in infectivity and pathogenicity around 10,000 years ago.[2]

Thus, leading to the positive selection of the sickle cell trait.

Obstetric Considerations of SCD

Pre-conception counselling and interventions: Discuss the inheritance of Sickle Cell disease with prospective mothers and partners, educating patients about the risk of affected offspring.

Reproductive options for patients with Sickle cell anaemia include: [4][5]

1. Preimplantation genetic testing (PGT) to select unaffected embryos for implantation; which requires conception by in vitro fertilization (IVF).
2. Sperm donation or oocyte donation from a donor without hemoglobinopathy.
3. Adoption.
4. Gestational carriers

Baseline Maternal Risks

Women with SCD are known to have a higher risk of both maternal and fatal complications. Therefore, a thorough pre-conception evaluation of medical fitness is essential to safeguard both mother and child.

1. **Risk of Sickle Crises:** The risk of vaso-occlusive and pain crises is markedly increased with the highest incidence (>90%) in the third trimester and the week after delivery.
2. **Infection:** SCD confers a significant impairment in clearing pathogens, leading to pregnant women being at high risk for pneumonia, sepsis, asymptomatic bacteriuria, and symptomatic UTIs. All must be treated aggressively at the earliest.
3. Hypertensive crises such as pre-eclampsia and eclampsia are significantly higher in its with SCD due to baseline hypertension and sickle nephropathy.
4. Operative delivery rates are higher both due to the occurrence of complications as well as caution on the part of obstetricians, leading to caesareans at the first instance of non-reassuring fetal rhythms.
5. Higher rates of venous and cerebral thromboembolism due to the added effects of pregnancy and sickle-induced increased viscosity. Especially with multifetal gestation.
6. Maternal mortality is higher with most cases related to sudden decompensation following a pulmo-nary embolism or multi-organ failure.

Pre-existing Medication Review and Infection Prevention

SCD patients are usually on various medicines, many of which are unsuitable for the developing fetus. They are also deficient in vitamins and micronutrients as a result of rapid RBC turnover and the risk of iron overload.

1. **Hydroxyurea:** While animal models and consensus lead us to believe that hydroxyurea would have significant fetal adverse effects, most studies have failed to demonstrate significant causality with major complications such as preterm births or congenital anomalies. One study showed an increased occurrence of miscarriage, stillbirth, and low birth weight but not in patients who discontinued hydroxyurea after conception. Therefore, evidence to stop this essential treatment is low and must be evaluated as per individual patient profiles.[13]
2. Hydroxyurea in males has been shown to reduce sperm cents and motility, thus temporary cessation of use is warranted to ensure conception.
3. Prenatal vitamins (without Iron), especially folic acid supplementation should be increased beyond the recommended amounts for pregnancy or SCD.

In African and Asian countries, multiple factors such as malnutrition, infection, and SCD require patients to start with daily 4mg, at least 3 months be-fore conception. According to the European Hematology Association minimum dose in high-resource settings is 1mg.

4. Other drugs like ACE inhibitors, angiotensin receptor blockers, and iron chelation therapy must be stopped. If they are essential, then pregnancy must be deferred till their use can be terminated safe-ly.
5. If not already taken, all patients with SCD should receive Pneumococcal, H. Influenza type B and me-ningococcal vaccines. Live vaccines are contraindicated in pregnancy.

Care During Pregnancy

Studies from several Western African nations with a high prevalence of SCD have shown that the intensive management of pregnancy with strict adherence to pre-natal visits and ultrasound testing has re-duced SCD-related mortality in mothers by almost 90%.[8]

The same principles must be used for general obstetric care of the patient with SCD:

1. **Adequate Hydration:** Hydration is the main preventive measure for SCD-related complications. Mothers with SCD must be encouraged to drink at least 2.3L of water per day, this along with fluids in other foodstuffs will contribute to the ideal intake of 3L/day. [3][5]
2. **Low-dose Aspirin:** Unless contraindicated, should be started after 12 weeks of gestation with daily dosing to prevent Pre-eclampsia.
3. **Folic acid supplementation:** As discussed above, 1-4mg to reduce the effects of high RBC turnover.
4. **Pain management:**
   - Active treatments that reduce pain crises, like Hydroxyurea, can be continued if patients have frequent painful crises. With regular ultrasonography and NST monitoring.[13][14]
   - Rapid diagnosis of the precipitating factor: Dehydration, Infection, Hypoxia
   - Aggressive pain control: Short courses (<48hrs) of NSAIDs for mild pain or opioids for moderate to severe pain, as fetal effects are not well understood.
5. **Transfusion requirements:** If needed, severe anaemia during acute complications and pain crises may be controlled with regular transfusion.[12]
6. **Pregnancy Loss:** Spontaneous pregnancy loss or termination is generally well tolerated. The goals are adequate hydration and reducing blood loss due to baseline anaemia. Surgical termination has been shown to minimize blood loss and is generally safer for patients with SCD than medical management.
7. Prophylactic home-based oxygen therapy in select patients
8. Complications such as preeclampsia, placental abruption, and intrauterine fetal demise can be man-aged as per standard protocols
9. **Venous thromboembolism prevention:** Hospital-isation for any cause other than labour and delivery requires low-molecular-weight heparin (LMWH) prophylaxis. [9]
10. Haemoglobin must be maintained between 9-10g/dL as Hb >10g is associated with hyperviscosity and increased complications.[15]

Intrapartum Management

1. There are no contraindications to vaginal delivery and it can be safely performed with adequate hydration, nasal oxygen, and keeping patients warm. [3][5]
2. Caesarean section may be performed for obstetric indications.
3. Continuous fetal heart rate monitoring is essential in women with SCD.
4. In anaemic patients, increase haemoglobin levels before labour with blood transfusion

Postpartum Care

1. Post-delivery thromboembolism prophylaxis with LMW Heparins is essential for both vaginal and ce-sarean deliveries.[9][10]
2. Mothers taking hydroxyurea may safely breastfeed babies according to some studies.
3. Newborns of mothers taking opioid analgesics should be screened for opioid withdrawal.
4. Cord blood may be used for newborn screening or stem cell harvesting.

Conclusion

Sickle Cell Disease in pregnancy requires multidisciplinary management with a special focus on preventing maternal and fetal complications due to anaemia, hyperviscosity syndrome, and medication use.

All mothers with SCD must be encouraged to maintain adequate hydration, and oxygenation and be screened for bacteriuria or genitourinary infections to prevent pain crises. Haemoglobin should also be

maintained at steady levels not exceeding 10g/dL. Regular antenatal follow-ups with fetal scans and monitoring are essential to prevent or diagnose fetal complications at the earliest. Pregnancy termination or loss should be managed surgically to reduce dehydration, hypoxia, and blood loss and are well tolerated.

Venous thromboembolism prophylaxis is a key component of any hospital admission and should be given following delivery. Low-dose aspirin is also recommended to reduce the risk of hypertensive emergen-cies and microvascular complications.

Oxygen and blood transfusions are reserved for acute emergencies and severe anaemia in labour.

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Conquer Cancer with Brachytherapy

– Dr. Harjot Kaur Bajwa

Brachytherapy, also known as internal radiation therapy, uses sealed radiation sources placed next to or inside the target area to destroy cancer cells. In comparison to typical radiation treatments that are administered externally, it enables a larger dosage of radiation to be delivered locally. This may be more successful in eliminating the cancer cells while causing less harm to the surrounding healthy tissue.

To get a better understanding of this therapy, The Indian Practitioner had an email interaction with Dr. Harjot Kaur Bajwa, Consultant Radiation Oncologist & Brachytherapy, AROI ABS Fellow (UCSF, USA) American Oncology Institute, Hyderabad, whose observations are reproduced here.

The Indian Practitioner (TIP): What is brachytherapy?

Dr. Harjot Kaur Bajwa (Dr.HB): Brachytherapy is an internal radiation modality that destroys cancer cells and shrinkstumors. The radiation often comes from a radioactive source that is placed inside the body or near the tumor in the form of seeds, ribbons, or wires.

TIP: What are the types of brachytherapy?

Dr. HB: Based on the technique, it is classified as:

- Intracavitary brachytherapy involves placing a radioactive source inside the body cavities like cervix, rectum & vagina
- Interstitial brachytherapy involves implanting a radioactive source directly inside the tumor
- Intraluminal brachytherapy involves placing a radioactive source inside tubular organs like theesophagus

Based on the radioactive source properties, it is classified as:

- **High-dose rate (HDR)**: HDR implants release high doses of radiation for 10 to 20 minutes. This is the most common form of brachytherapy delivered across all sites
- **Low-dose rate (LDR)**: LDR implants release low doses of radiation continuously for one to seven days
- **Permanent**: Permanent radioactive implants release radiation continually, and the level of radioactivity quickly decreases over time until they become inactive

TIP: How is brachytherapy different from other forms of radiation?

Dr. HB: Brachytherapy is the most conformal form of radiation among all radiation types. The properties of a brachytherapy source allow the delivery of very high radiation doses to the tumor and very minimal doses to the surrounding normal tissue. Achieving a dose of 200-300 % in the center of the target and a sharp dose fall-off beyond the periphery of the tumor is not achievable by any other radiation modality except brachytherapy

TIP: What are the common cancers that can be treated with brachytherapy?

Dr. HB: Any site in the body that is accessible for brachytherapy source placement can be treated by brachytherapy. Brachytherapy plays a significant role in the treatment of gynecological cancers, prostate cancer, head and neck cancer, breast cancer, sarcomas, esophageal cancer,and skin malignancies.

TIP: What are the advancements in brachytherapy for cervical and uterine cancer?

Dr. HB: The main treatment of advanced Carcinoma Cervix involves both external radiation and brachytherapy. Radiation-induced complications have been reduced to a minimum by the use of advanced brachytherapy techniques (hybrid/ interstitial brachytherapy) and three-dimensional (3D) imaging and sophisticated planning methods. With modern brachytherapy techniques, it is now possible to achieve very high local control even in advanced cervical cancer. The long-term data from the EMBRACE group showed that chemoradiotherapy and MRI-based image-guided adaptive brachytherapy results in effective and stable long-term local control across all stages of locally advanced cervical cancer, with a limited severe morbidity per organ.

For stage I and II uterine cancer, the use of external radiotherapy after surgery is declining as it is associated with high toxicity. The prospective PORTEC II trial compared vaginal brachytherapy and external beam radiotherapy in patients older than 60 years with stage IB/G1–2 or stage IA/G3 disease. The results showed that both modalities were equieffective in terms of overall survival and cancer-specific survival with better quality of life in the brachytherapy arm.

TIP: What is the evidence for brachytherapy in prostate cancer?

Dr. HB: In low-risk and favorable intermediate-risk prostate cancer, brachytherapy can be delivered as monotherapy without the need for surgery or external radiation. It is an outpatient procedure providing treatment in one or two sessions. In unfavorable intermediate-risk and high-risk prostate cancer, the addition of brachytherapy to external radiationimproves local control as compared to external radiation alone. Brachytherapy has comparable survival rates and fewer side effects in terms of impotence and incontinence as compared to surgery for prostate cancer. For recurrent prostate cancer, brachytherapy is the treatment modality of choice as it has the least side effects compared to other radiation techniques.

TIP: How is brachytherapy useful in head and neck cancer?

Dr. HB: : The majority of patients with head and neck cancer have locally advanced disease at diagnosis, and multimodality treatment remains the mainstay of treatment involving surgery, radiotherapy, and chemotherapy. Brachytherapy of the tongue, buccal mucosa, and lip offers excellent cure rates in the early stage. Tumors larger than 2 cm, infiltrative with potential spread to lymph nodes, are treated with a combination of external radiation and brachytherapy boost. As compared to surgery, the function of these organs is preserved, and the cosmetic outcome is excellent.

Post-operative brachytherapy in the adjuvant setting is used in case of positive margins and significantly reduces the chances of local recurrence. Brachytherapy is also the treatment of choice for recurrence after previous radical treatment due to the least toxicity to critical organs.

TIP: What is the role of brachytherapy in breast cancer?

Dr. HB: : Brachytherapy-based accelerated partial breast irradiation (APBI) after breast-conserving surgery (BCS) for low-risk, early-stage breast cancerinvolves fewer days than traditionalradiation treatment. It offers excellent cure rates and cosmetic outcomes without the need for removing the entire breast. Because of this, more women are likely to participate in adjuvant therapy, reducing the risk of recurrence.

TIP: What is the scenario of brachytherapy treatment in India?

Dr. HB: Brachytherapy is a minimally invasive procedure that is performed under anaesthesiaand requires significant skill and expertise. The quality of brachytherapy services may varyacross institutions. Brachytherapy should be performed at a center following strict quality-assurance standards. Brachytherapy is a highly efficient and cost-effective treatment modality that can improve outcomes .in various cancers. Thus, we need to focus on the development of high-quality brachytherapy services across all oncology centers in India.

Note: The observations in this interview are the expert's own and are not endorsed directly or indirectly by The Indian Practitioner.

First Successful Plea of Insanity Defence in History: The Case of James Hadflied

Dr. Ashoka Jahnavi Prasad

Nothing shows better how the practice of psychiatry is constantly modified by social influences and how in turn its social implications modify society's attitude and hence indirectly also that of psychiatrists to the insane, than the history of the medico-legal aspects of insanity. For this reason, Blackstone's Commentaries (1765) on the development of medico-legal doctrines and contemporary practice have an important place in psychiatric history. The next milestone in criminal law as it relates to insanity was the trial for high treason on 26 June 1800 of James Hadfield. He was charged on 15th May at the "Drury-lane theatre" that he "did shoot off and discharge a certain pistol, then and there being loaded with gunpowder and diverse leaden shots slugs and bullet. . . at the person of our said lord, the king, with intent thereby and there¬with maliciously and traitorously to shoot, assassinate, kill and put to death we said lord, the king, against the duty of allegiance of him the said James Hadfield…" [1]

The crime itself - one of the six attempts made on the life of George III -aroused wide interest. In the Attorney-General's words, it was "one of the highest and of the most heinous nature, involving in its probable consequences everything which can affect the peace and happiness of the country." But of much greater and historic significance was the trial that followed and this because Hadfield had the good fortune to be defended by Thomas Erskine in one of the ablest and most lucid pleadings of all time who surveyed the relation of insanity to criminal responsibility and defined the circumstances in which an offender should be adjudged not answerable in law. Erskine maintained that "the knowledge of good and evil" was "too general a criterion" although even in the "McNaughton Rules (1843), which came into existence much later, the judges still held that if 'the party accused had a sufficient degree of reason to know that he was doing an act that was wrong" he was punishable (whereby they merely substituted the knowledge of "right and wrong" in law for that of "good and evil") [1]. He pointed out that Hadfield knew his action to be "evil" - indeed hoped to be put to death for it, and even more paradoxically, that it was directly contrary to his exalted and proven patriotic sentiments. He contended that in the absence of obvious "frenzy or raving madness . . . delusion . . . is the true character of insanity" a direct "relation between the disease and the act" must be established to "deliver a lunatic from responsibility to criminal justice" and the defense must prove "that the act in question was the immediate, unqualified offspring of the disease".

To demarcate the line, beyond which the plea of irresponsibility on the grounds of insanity could not be accepted, Erskine reviewed the trial in 1760 of Lawrence Shirley, the 4th Earl Ferrers, who shot his steward in a fit of rage. Ferrers pleaded insanity but not being allowed counsel in conformity with the practice of the time found himself in the impossible situation of having to establish by his own wits that he was mad. He was found guilty and publicly hanged, the last peer so punished. Erskine agreed with the verdict because the law "cannot allow the protection of insanity to a man who only exhibits violent passions and malignant resentments, acting upon real circumstances".

Hadfield's illness itself, as unfolded by Erskine, has interesting features since he apparently developed a paranoid schizophrenia-like condition following a head injury. Born around 1771 he became a soldier in 1793 and served in Flanders with personal duties to the Duke of York. In 1794 he received severe injuries in battle which he was not expected to survive. That resulted in "the immediate event of insanity . . . from violence to the brain, which permanently affects its structure". In 1796 he was "discharged from the army upon the

Dr. Ashoka Jahnavi Prasad is identified as the most educationally qualified person in the world by The Polymath. He has a dynamic resume with a PhD in history of medicine from Cambridge, LLM from Harvard among other notable qualifications. Dr. Prasad has also worked as a consultant to the World Health Organization (WHO) and helped prepare two of their reports.

ground of insanity" with delusions concerning the imminent end of the world and salvation of a type that recurs throughout the history of psychiatry. Shortly before the deed he was in contact with "one Truelock, a lunatic" who preached "that our Saviour's second advent, and the dissolution of all human things, were at hand" and this precipitated "the insane delusion . . . of his own propitiation and sacrifice for mankind. He imagined . . .that the world was coming to a conclusion . . . he was to sacrifice himself for its salvation . . . and, because he would not be guilty of suicide, though called upon by the imperious voice of Heaven, he wished that by the appearance of crime, his life might be taken away from him by others". [1] Two days before his attempt on the king, he had attempted to destroy his eight-month-old son "for the benefit of mankind", although he "knew perfectly well that he was the husband of the woman and the father of the child; the tears of affection ran down his face at the moment when he was about to accomplish its destruction".[1] Neither had he "an idea...of the destruction of the king; on the contrary, he always maintained his loyalty; lamented that he could not go again to fight his battles". Henry Cline (1750-1827) surgeon at St Thomas's Hospital and Sir Alexander Crichton (called Dr. Creighton in the report of the trial) deposed respectively about the extent of the head wounds, the likelihood of brain damage, and the nature of his insanity.

So convincing was Erskine's pleading that when he ended the Lord Chief Justice in agreement with the Attorney-General and Solicitor-General for the Crown stopped the trial and directed the jury to find Hadfield "Not Guilty; he being under the influence of insanity at the time the act was committed". This verdict led to the judicial difficulty of what was to be done with him; since to release him would have been dangerous to the community as well as himself; but no legal title existed to detain him. Therefore, within one month of the verdict, there was hurriedly passed an Act for the safe custody of insane persons charged with offenses, 39 & 40 George III, c. 94, 1800 "which provided that if "any person, charged with treason, murder, felony" was found to have been "insane at the time of the commission of such offense" and hence acquitted, "the Court shall . . . order such persons to be kept in strict custody, in such place and in such manner as to the. The court shall seem fit until His Majesty's pleasure shall be known. Hadfield was accordingly committed to Bethlem Hospital where he survived until 1849.

However, this Act did not cover a verdict of guilty but insane and this was incorporated in 1840 after the trial of Edward Oxford who was so found for "discharging two pistols at her Majesty" in an Act for making further provision for the confinement and maintenance of insane prisoners, 3 & 4 Victoria, c. 54. This extended the powers of the Royal Warrant granted under the Act of 1800 to offenses less than treason and provided for a Secretary of State's warrant by which insane prisoners could be transferred to an asylum. These Acts were superseded in 1883 by an Act for the Trial of Lunatics, 46 & 47 Victoria, c. 38 by which the jury was required to find not only whether the prisoner was insane at the time of the crime but also whether he had committed it. "Criminal lunatics" (an unsatisfactory term as it included insane offenders not found guilty but for whom the alternate term "state prisoner" did not gain currency) remained in special wards at Bethlem and county asylums until Broadmoor Asylum, the central state institution opened in 1863.

Even before these laws were passed the practice had been to confine insane offenders in madhouses without necessarily bringing them to trial. In 1777, for example, a known lunatic was sent for life to William Perfect's madhouse for matricide; in 1786 Margaret Nicholson who attempted to stab George III with a blunt table knife was committed to Bethlem Hospital by order of the Privy Council after an examination by Drs John and Thomas Monro; and in 1796 Mary Lamb was sent by authority of the Coroner's Court to Roxton House Asylum for murdering her mother while suffering from temporary insanity. [1]

The details of this trial are generally unknown even to forensic psychiatrists. Had it not been for my doctoral research, I would not have known about Erskine's brilliant defense that prevented a major miscarriage of justice.

Lord Erskine's brief is very cogent and would prove most instructive, not just for the medical and legal professions, but also for the healthcare planners. I have myself made a strong case for special hospitals modeled after Broadmoor and Carstairs in India. The few who are declared not guilty by reason of insanity in our country are entitled to and deserve such a facility.

Thomas Erskine's Successful Plea of Insanity: Not Guilty, But Insane [1]

"The law, as it regards this most unfortunate infirmity of the human mind, like the law in all its branches, aims at the utmost degree of precision; but there are some subjects . . . and the present is one of them, upon which it is extremely difficult to be precise. The general principle is clear, but the application is most difficult . . . I agree with the attorney-general, that the law, in neither civil nor criminal cases, will measure the degrees of men's understandings; and that a weak man, however much below the ordinary standard of human intellect, is not only responsible for crimes, but is

bound by his contracts, and may exercise dominion over his property. Sir Joseph Jekyll, in the Duchess of Cleveland's case, took the dear legal distinction, when he said, 'The law will not measure the sizes of men's capacities, so as they be compos mentis'. Lord Coke, in speaking of the expression non-compos mentis, says, 'Many times, as here, the Latin word expresses the true sense, and calleth him, not amens, demens, juriosus lunaticus, fatuus, stultus, or the like, for non-compos mentis is the surest and legal'. He then says, 'Non compos mentis is of four sorts: first idiota, which, from his nativity, by a perpetual infirmity, is non compos mentis; secondly, he that by sickness, grief, or other accident, wholly loses his memory and understanding; third, a lunatic that hath sometimes his understanding, and sometimes not; aliquando gaudet lucidis interval/is; and therefore he is called non-compos mentis so long as he hath not understanding' . . . Lord Hale says, 'There is partial insanity of mind and total insanity. The former is either in respect to things, quod hoc vel illud insanire; some persons, that have a competent use of reason in respect of some subjects, are. yet under particular dementia in respect of some particular discourses, subjects, or applications; or else it is partial in respect of degrees; and this is the condition of very many, especially melancholic persons, who for the most part discover their defect in excessive fears and griefs, and yet are not wholly destitute of the use of reason; and this partial insanity seems not to excuse them in the committing of any offense… it is very difficult to define the invisible line that divides perfect and partial insanity; but it must rest upon circumstances duly to be weighed and considered both by judge and jury, lest on the one side, there be a kind of inhumanity towards the defects of human nature; or, on the other side, too great an indulgence given to great crimes' . . .

The attorney-general, standing undoubtedly upon the most revered authorities of the law, has laid it down, that to protect a man from criminal responsibility, there must be a total deprivation of memory and understanding. . . but the true interpretation of it deserves the utmost attention and consideration of the Court. If a total deprivation of memory . . . meant, that, to protect a man from punishment, he must be in such a state of prostrated intellect, as not to know his name, nor his condition, nor his relation towards others - that if a husband, he should not know he was married; or, if a father, could not remember that he had children; nor know the road to his house, nor his property in it - then no such madness ever existed in the world. It is idiocy alone which places a man in this helpless condition . . . But in all the cases which have filled Westminster hall with the most complicated considerations - the lunatics and other insane persons who have been the subjects of them, have not only had memory, in my sense of the expression - they have not only had the most perfect knowledge and recollection of all the relations that stood in towards others, and of the facts and circumstances of their lives, but have, in general, been remarkable for subtlety and acuteness. Defects in their reasonings have seldom been traceable - the disease consisting in the delusive sources of thought; all their deductions within the scope of the malady being founded upon the immoveable assumption of matters as realities, either without any foundation whatsoever or so distorted and disfigured by fancy, as to be almost nearly the same thing as their creation. It is true, indeed, that in some, perhaps in many cases, the human mind is stormed in its citadel, and laid prostrate under the stroke of frenzy; these unhappy sufferers, however, are not so much considered by physicians as maniacs as to be in a state of delirium from fever . . . Such persons and such persons alone (except idiots) are wholly deprived of their understandings . . . But these cases are not only extremely rare but never can become the subjects of judicial difficulty. There can be but one judgment concerning them. In other cases, the reason is not driven from her seat, but distraction sits down upon it along with her . . . Such patients are victims to delusions of the most alarming description, which so overpower the faculties, and usurp so firmly the place of realities, as not to be dislodged and shaken by the organs of perception and sense . . . Here, too, no judicial difficulties cap presents themselves . . . Another class . . . is, where the delusions are not of that frightful character, but infinitely various, and often extremely circumscribed …and these are the cases which frequently mock the wisdom of the wisest in judicial trials; because such persons often reason with a subtlety which puts in the shade the ordinary conceptions of mankind: their conclusions are just, and frequently profound; but the premises from which they reason, when within the range of the malady, are uniformly false: - not false from any defect of knowledge or judgment; but, because a delusive image, the inseparable companion of real insanity, is thrust upon the subjugated understanding, incapable of resistance, because unconscious of attack.

Delusion, therefore, where there is no frenzy or raving madness, is the true character of insanity; and where it cannot be predicated of a man standing for life or death for a crime, he ought not, in my opinion, to be acquitted . . . I must convince you, not only that the unhappy prisoner was a lunatic, within my own definition of lunacy, but that the act in question was the immediate, unqualified offspring of the disease . . . to deliver a lunatic from responsibility to criminal justice, and above all, in a case of such atrocity as the present, the relation between the disease and the act should be apparent. Where the connexion is doubtful, the judgment should certainly be most indulgent, from the great difficulty of diving into the secret sources of a disordered mind; but still, I think, that, as a doctrine of law, the delusion and the act should be connected…I cannot allow the protection of insanity to a man who only exhibits violent passions, and malignant resentments, acting upon real circumstances;

who is impelled to evil from no morbid delusions; but who proceeds upon the ordinary perceptions of the mind. I cannot consider such a man as falling within the protection which the law gives.

Gentlemen, it has pleased God so to visit the unhappy man before you; to shake his reason in its citadel; to cause him to build up as realities, the most impossible phantoms of the mind, and to be impelled by them as motives irresistible; the whole fabric being nothing but the unhappy vision of his disease - existing nowhere else - has no foundation whatsoever in the very nature of things... But it is said, that whatever delusions may overshadow the mind, every person who has the knowledge of good and evil ought to be responsible for crimes. I think I can presently convince you, that there is something too general in this mode of considering the subject … Let me suppose. . . that he believed the man he had destroyed, to have been a potter's vessel; that it was quite impossible to doubt that fact, although, to all other intents and purposes, he was sane. . . and was utterly unconscious that he had struck at the life of a human being? I only put this case, and many others might be brought as examples to illustrate, that the knowledge of good and evil is too general a description. . .The question, therefore, which you will have to try, is this: whether. . . this unhappy man . . . meditated mischief and violence to his majesty, or whether he came to the theatre (which it is my purpose to establish) under the dominion of the most melancholic insanity that ever degraded and overpowered the faculties of man . . . In every case of treason, or murder . . . the jury must impute to the person whom they condemn by their verdict, the motive which constitutes the crime; and... decide, whether the prisoner, when he did the act, was under the uncontrollable dominion of insanity, and was impelled to it by a morbid delusion; or whether it was the act of a man, who, though occasionally mad . . . was yet not actuated by the disease . . .

The unfortunate person before you were a soldier . . . the first wound he received is most materially connected with the subject we are considering. . . The effects . . . were known by the immediate event of insanity . . . There the disease is, from its very nature incurable. . .. where a man . . .has become insane from violence to the brain, which permanently affects its structure. He imagined that he had constant intercourse with the Almighty Author of all things; that the world was coming to a conclusion; and that, like our blessed Saviour, he was to sacrifice himself for its salvation; and so obstinately did this morbid image continue . . . that . . . he went to the theatre to perform, as he imagined, that blessed sacrifice; and, because he would not be guilty of suicide, though called upon by the imperious voice of Heaven, he wished that by the appearance of crime, his life might be taken away from him by others . . . The. idea which had impressed itself, but in most confused images, upon this unfortunate man, was, that he must be destroyed, but ought not to destroy himself . . .

There is, however, another consideration which I ought distinctly to present to you . . . namely, whether the prisoner's defense can be impeached for artifice or fraud . . . but for such a suspicion there is not even a shadow of foundation . . .

I declare to you, solemnly, that my only aim has been to secure for the prisoner at the bar, whose life and death are in the balance, that he should be judged rigidly by the evidence and the law . . . It is a most important consideration both as. it regards the prisoner and the community of which he is a member. - Gentlemen, I leave it with you."

Reference

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"I want to empower women radiologists and raise awareness about preventive radiology" - Dr. Sunita Dube

Although initially unsure about pursuing a career in medicine, Dr. Dube's father's encouragement and her own innate empathy for others led her to take the challenging path of becoming a doctor. With determination and perseverance, she overcame doubts and obstacles, becoming the first doctor in her family.

Dr. Sunita Dube has always been driven by a deep desire to care for others and make a positive impact on society. From a young age, she felt a strong calling to serve humanity, alleviate suffering, and bring comfort to the sick and ailing.

The path of Dr. Sunita Dube in the field of medicine has been shaped by a profound sense of destiny and purpose. Since her early days, she demonstrated a compassionate and gentle approach to caring for her ailing grandfather, a quality that would later define her dedication to serving the broader community. With unwavering humility and an unwavering commitment, she fully embraced her calling as a healer, leaving a lasting impact on the lives of those she has touched.

Compassion and Dedication

As a doctor, Dr. Dube has dedicated herself to continuous learning and personal growth. Every day, she acquires new skills and experiences, honing her abilities to better serve her patients and the community. Driven by her caring and compassionate nature, she goes above and beyond, not only in her clinical practice but also in her involvement with non-profit organizations like MedScpaeIndia.

Through MedScpaeIndia, Dr. Dube spearheads projects that focus on saving the girl child, sponsoring education for girls, promoting the Fit India movement, and conducting community welfare programs. Her commitment to social causes and her desire to make a difference have earned her admiration and respect.

Long term Vision

Dr. Dube's vision extends beyond her current accomplishments. She envisions establishing a research center and providing training nationwide for life-saving techniques such as CPR. With a strong belief in the importance of radiology in healthcare, she strives to enhance the image of radiologists and raise awareness about preventive radiology. Her goal is to empower women radiologists and establish low-cost schools and hospitals to benefit a wider population.

Throughout her journey, Dr. Dube remains focused on giving her best in everything she does. She approaches her work with sincerity, happiness, and a commitment to organization and discipline. Her profound impact on healthcare, coupled with her compassionate approach, continues to shape the lives of individuals and communities across the nation.

Acclaimed Radiologist

Dr. Sunita Dube is an acclaimed MD radiologist, philanthropist, and healthcare entrepreneur. Dr. Dube's innovative and ground breaking work has earned her accolades from esteemed dignitaries such as Hon. Ex-President Pranab Mukherjee, His Holiness the Dalai Lama, Bharat Ratna Dr. APJ Kalam, and Honourable President Ram Nath Kovind. Her valuable contributions to accessible healthcare, philanthropy,

and innovation have been widely appreciated.

A Case Study

Dr. Dube shared one of her interesting cases with us:

"A 13 year old girl had undergone rare surgery due to intestinal Obstruction at Aryan Hospital. The patient had come with complaints of abdominal pain, and inability to pass stools for 3 - 4 days with recurrent vomiting on 17th October 2012.

Dr. Prajakt Patil surgeon, said, "She had no previous history except for evaluation of some psychiatric symptoms with medications being taken. Abdominal X Rays revealed features of intestinal obstruction. Hence conservative treatment in the form of intravenous fluids and injectable antibiotics was started. She was kept nil by mouth to prevent further vomiting and a nasogastric tube was introduced to drain all gastric contents to prevent distention."

"This failed to provide any relief and the distention persisted after 24 hours. Hence a CT scan was done on 19th October 2012 in the morning. This revealed intestinal obstruction with proximal intestinal, stomach dilated fully, and collapsed distal intestinal loops. Hence an obstruction agent probably a lesion or intestinal pathology was suspected at mid intestinal level. A decision to perform emergency surgery to relieve obstruction was taken." said Dr. Sunita Dube, Director of Aryan Hospital.

"Hence an emergency surgery was performed on 19th October 2012 immediately after the CT scan report and the findings totally amazed us. There was a large ball of hair of 8x6x4 cm in dimensions causing bolus obstruction at 15 cm from the junction of the small and large intestines leading to obstruction at mid-intestine level with proximal massive dilatation. It was large enough to completely occlude the intestine and prevent any peristalsis. It weighed 40 grams.

Psychiatric Disorder

Dr. Sunita explained that about Trichotillomania is a psychiatric disorder with the compulsive urge to pull out (and in some cases, eat) one's own hair leading to noticeable hair loss, distress, and social or functional impairment. The peak age of onset is 9 to 13. It may be triggered by depression or stress. Common areas for hair to be pulled out are the scalp, eyelashes, eyebrows, arms, hands, and pubic hairs.

In trichophagia, people with trichotillomania also ingest the hair that they pull; in extreme (and rare) cases this can lead to a hair ball (trichobezoar Rapunzel) syndrome an extreme form of trichobezoar in which the "tail" of the hairball extends into the intestines, can be fatal if misdiagnosed.

Anxiety depression and obsessive–compulsive disorder is more frequently encountered in people with trichotillomania. Treatment is based on a person's age. Most preschool-age children outgrow it if the condition is managed conservatively. In young adults, establishing the diagnosis and raising awareness of the condition is an important reassurance for the family and patient. Non-pharmacological interventions, including behavior modification programs, may be considered; referrals to psychologists or psychiatrists are a must. When trichotillomania begins in adulthood, it is often associated with other psychiatric disorders and referral to a psychologist or psychiatrist for evaluation or treatment is considered best. The hair pulling may resolve when other conditions are treated.

"Shave or groom. In doing so this shortens the hair and prevents the individual from "twisting and pulling" on post-operative treatment."

Habit Reversal training (HRT) has the highest rate of success in treating trichotillomania. HRT has been shown to be a successful adjunct to medication as a way to treat trichotillomania. With HRT, doctors train the individual to learn to recognize their impulse to pull and also teach them to redirect this impulse."

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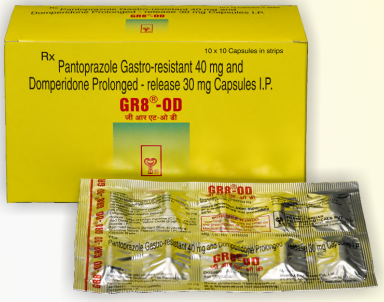

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Vitamin K Helps Protect Against Diabetes

Canadian researchers have identified a new role for vitamin K and gamma-carboxylation in beta cells and their potentially protective role in diabetes, achieving a first in 15 years of basic research.

The discovery by scientists at Université de Montréal and its affiliated Montreal Clinical Research Institute (IRCM) is a welcome advance in the understanding of the mechanisms underlying diabetes, a disease that affects one in 11 people worldwide and has no cure.

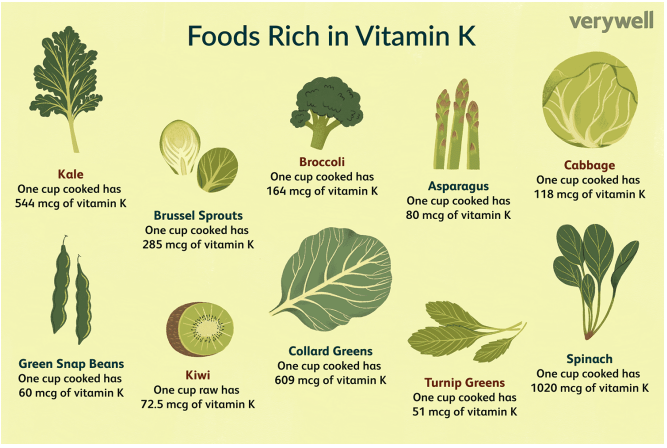
Published May 11 in *Cell Reports*, the study explains, at least in part, how vitamin K helps prevent diabetes, and could lead to new therapeutic applications for type 2 diabetes.

Vitamin K is a micronutrient known for its role in blood clotting, in particular in gamma-carboxylation, an enzymatic reaction essential to the process. It has been suspected for several years that this vitamin, and thus gamma-carboxylation, may have other functions as well.

Several studies suggest a link between a reduced intake of vitamin K and an increased risk of diabetes. However, the biological mechanisms by which vitamin K protects against diabetes remained a mystery until now.

Enzymes in large quantities

In their study, UdeM associate research professor of medicine Mathieu Ferron and his team at the IRCM were first able to determine that the enzymes involved in gamma-carboxylation and therefore in the use of vitamin K were present in large quantities in pancreatic beta cells, the very cells that produce the precious insulin that controls blood sugar levels.



"Diabetes is known to be caused by a reduction in the number of beta cells or by their inability to produce enough insulin, hence our keen interest in this novel finding," said Ferron, a leading researcher in molecular biology. "In order to elucidate the cellular mechanism by which vitamin K maintains beta cell function, it was essential to determine which protein was targeted by gamma-carboxylation in these cells."

"We were able to identify a new gamma-carboxylated protein called ERGP," added Julie Lacombe, who conducted the work in Ferron's laboratory. "Our study shows that this protein plays an important role in maintaining physiological levels of calcium in beta cells in order to prevent a disturbance of insulin secretion. Finally, we show that vitamin K through gamma-carboxylation is essential for ERGP to perform its role."

This is the first time in 15 years that a novel vitamin K-dependent protein has been identified, opening a new field of research in this area.

How Vitamin D_3 Helps Allergic Asthma

A vitamin D_3 deficiency can lead to severe symptoms, for example in people suffering from allergic asthma. This has already been shown in several studies. However, we still do not fully understand how exactly this vitamin influences the cellular inflammatory reaction in the body.

A team of researchers from the Department of Molecular Pneumology at Universitätsklinikum Erlangen has now demonstrated for the first time how taking vitamin D3 can alter the cellular inflammatory reaction in allergic asthma and alleviate asthma symptoms.

Doctoral candidate Janina Grund and the members of the working group led by Prof. Dr. Susetta Finotto from the Department of Molecular Pneumology have investigated the

clinical manifestation of asthma in preschool children and adults in the context of vitamin B3 levels in their blood and taking vitamin D3 supplements.

The team of researchers discovered that children and adults who took vitamin D3 supplements had less pronounced asthma symptoms and presented with less severe asthma, at the same time as requiring fewer steroids for inhalation. In certain cells in the blood of people with higher levels of vitamin D3, scientists discovered greater quantities of the protein blimp-1, which is responsible for controlling the immune response of T helper cells.

In order to gain a better understanding of the mechanism, Janina Grund investigated the effects administering vitamin D3 has on the immune response in mice. Once again, the vitamin led to less severe cases of asthma.

She also found fewer allergy-inducing antibodies (IgE) that are responsible for certain allergic diseases such as hay fever, asthma or eczema. Administering higher doses of vitamin D3 even triggered an anti-inflammatory reaction in the immune system, specifically with the messenger substance IL-10 and cells that create blimp-1.

Interestingly, the working group was able for the first time to prove that the vitamin has an effect on long-lived memory T cells that are key to the long-term immune response in the case of asthma.

The research team demonstrated that taking vitamin D3 supplements has a positive effect for asthma patients, underlining how important it is that they have enough of this vitamin. As it is hard to give specific recommendations for treatment based on this basic research, however, patients should contact their doctor if they have any questions.

A Hypocaloric Diet Attenuates Brain Changes Related to Age-Associated Memory Loss

A study coordinated by the Institute of Neurosciences of the UAB (INc-UAB) analyzes in old rats the effects of a calorie-restricted diet on the hippocampus, a brain structure that is critical in learning and memory processes. The results corroborate that there is a cognitive improvement derived from diet, linked to a reduction in the levels of inflammation and neuronal loss in the hippocampus.

Advances in the scientific, technological, and health sectors have led to an increase in life expectancy in our society and consequently, to a greater incidence of neurodegenerative diseases associated with age. This improvement in life expectancy therefore also requires research into strategies that can delay brain aging.

In this regard, it has been described that some of the brain alterations observed during aging, which may include an increase in oxidative stress and neuroinflammation, alterations in gene expression, a reduction in neurogenesis, and a dysregulation of mechanisms involved in synaptic plasticity, are related to the cognitive dysfunction that manifests naturally as we age. These processes, which depend on both genetic and environmental factors, are particularly important in the hippocampus.

Calorie-restricted diets have been shown to extend life expectancy and improve cognitive status, both in humans and in animal models, but many of the cellular processes associated with these benefits are still unknown. In this study, coordinated by Professor Gemma Guillazo from the INc-UAB and

the Department of Psychobiology and Methodology, and Professor Carlos Barcia from the INc-UAB and the Department of Biochemistry and Molecular Biology, researchers confirm the ability to memorize and learn in rats on calorie-restricted diets compared to rats fed a constant supply of food, and analyzed the effects on the hippocampus.

The results show that the group that followed a hypocaloric diet had better results in the spatial object recognition test, a memory test that allows you to evaluate, among others, the functioning of the hippocampus. In addition, the data obtained suggest that this improvement is linked to a reduction in both age-related neuronal loss and inflammatory activity in this structure.

"This article evidences the effects of the hypocaloric

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diet in the preservation of hippocampal functions and in the reduction of neuroinflammation associated with aging, and supports interventions at this level to improve the quality of life of elderly people," explains Dr.Guillazo.

The study highlights the potential of changes in habits, such as dietary modifications, to promote healthy aging of the brain and prevent age-related cognitive deficits.

Pungent Ginger Stimulates Immune System

Ginger has a reputation for stimulating the immune system. New results from the Leibniz Institute for Food Systems Biology at the Technical University of Munich now support this thesis. In laboratory tests, small amounts of a pungent ginger constituent put white blood cells on heightened alert. The study also shows that this process involves a type of receptor that plays a role in the perception of painful heat stimuli and the sensation of spiciness in food.

Whether as a medicinal plant or foodstuff, ginger is also becoming increasingly popular in Germany. According to the German Federal Statistical Office, the annual import volume of the fruity-hot root has almost quadrupled over the last ten years to around 31,600 tons. However, even though ginger consumption has increased, the question arises as to whether normal consumption levels are sufficient to achieve health effects. And if so, which compounds and molecular mechanisms play a role in this?

Ginger compound enters the blood

To help clarify these questions, a team led by Veronika Somoza, director of the Leibniz Institute in Freising, Germany, conducted extensive research. The starting point was a result of an earlier pilot study, in which first author Gaby Andersen from the Leibniz-LSB@

TUM also played a key role. As the study shows, significant amounts of pungent ginger compounds enter the blood about 30 to 60 minutes after consuming one liter of ginger tea. By far the highest levels were achieved by [6]-gingerol, with plasma concentrations of approximately 7 to 17 micrograms per liter.

The pungent compound is known to exert its "taste" effect via the so-called TRPV1 receptor, an ion channel located on the surface of nerve cells that responds to painful heat stimuli as well as to pungent compounds from chili and ginger. Since some studies suggest that white blood cells also possess this receptor, the research team tested whether [6]-gingerol influences the activity of these immune cells.

A pungent compound stimulates white blood cells

In the first step, the team succeeded in detecting the receptor on neutrophil granulocytes. These cells make up about two-thirds of white blood cells and serve to combat invading bacteria. Further laboratory experiments by the research group also showed that even a very low concentration of almost 15 micrograms of [6]-gingerol per liter is sufficient to put the cells on heightened alert. Thus, compared to control cells, the stimulated cells reacted about 30 percent more strongly to a peptide that simulates a bacterial infection. Addition of a TRPV1 receptor-specific inhibitor reversed the effect induced by [6]-gingerol.

"Thus, at least in experiments, very low [6]-gingerol concentrations are sufficient to affect the activity of immune cells via the TRPV1 receptor. In blood, these concentrations could theoretically be achieved by consuming about one liter of ginger tea," says Gaby Andersen. "So, our results support the assumption that the intake of common amounts of ginger may be sufficient to modulate cellular responses of the immune system. Nevertheless, there are still many unanswered questions at the molecular, epidemiological and medical levels that need to be addressed with the help of modern food and health research," concludes Veronika Somoza.

Biologic Therapy Can Ease Nerve Pain from Chemo and Diabetes

Autologous conditioned serum (ACS) -- a biologic therapy that famous athletes swear by to treat arthritis and sports injuries -- also shows benefits or the kind of neurological pain caused by chemotherapy or diabetes.

In a study using rodents, Duke Health researchers found that a spinal injection of the conditioned serum eased limb pain for far longer than typical analgesics. They also showed that this long-lasting pain relief results from a process outside the anti-inflammatory effects previously ascribed to ACS -- an insight that could enhance and expand the therapy's use.

The findings are published online in the journal Brain Behavior and Immunity.

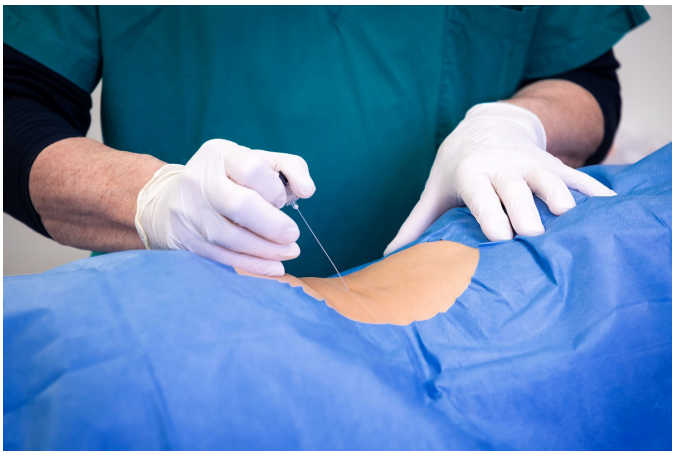
"This treatment just seemed to be more effective and longer lasting than other biologic therapies," said lead author Thomas Buchheit, M.D., associate professor in Duke's Department of Anesthesiology and director of the Duke Regenerative Pain Therapies Program.

ACS is produced from a person's own blood, which is then processed in a centrifuge to remove the blood cells and concentrate the anti-inflammatory proteins. While not FDA approved, the therapy is offered at Duke as well as a handful of other centers in the United States, and for years has been extolled by athletes who undergo injections for cartilage injuries.

Buchheit and co-senior author Ru-Rong Ji, Ph.D., began to collaborate to better understand the long-lasting drivers of pain relief with ACS. Ji is a professor in the departments of Anesthesiology, Neurobiology , and Cell Biology at Duke, and has expertise in the molecular and cellular mechanisms underlying pain; he is also director of the Center for Translational Pain Medicine.

The research team additionally tapped the expertise of co-senior author Tony Jun Huang, Ph.D., professor of Mechanical Engineering & Material Science, who focuses on the micro-particles in fluids for biomedical diagnostics and therapeutics.

The Duke team used human, rat, and mouse ACS fluid to test its effectiveness as a therapy for neuropathy. The serums were injected in both mice and rats after the animals had undergone a regimen of the chemotherapy drug paclitaxel, which is used to treat breast, ovarian, and lung cancers. The most common side effect of paclitaxel is numbness and tingling in the hands and feet.



Not only did the therapy alleviate the animals' nerve pain, but its effect lasted several weeks – well beyond the hours or days provided by normal pain medicines.

"That prompted us to examine what was driving this long-lasting effect, because it could not be explained by the typical anti-inflammatory properties that we associate with ACS," Buchheit said.

Specifically, the benefits of ACS have largely been attributed to the abundance of growth proteins and anti-inflammatory cytokines isolated in the serum. Cytokines are signaling proteins that help regulate inflammation. But these proteins would only produce short-lived results, not the long-term benefits seen in the study and experienced in real-world clinical situations.

Instead, the Duke researchers found that exosomes appear to be the component that gives ACS its durability. These tiny vesicles contain a host of molecules that fight inflammation, including micro-RNAs, and they become highly activated through the conditioning and incubation process of ACS.

"Our finding is that exosomes small packages of information that cells such as immune cells share are responsible for the long-term pain-relieving effects of ACS," Ji said. "By describing this newly identified mechanism for how ACS provides extended pain relief, we can explore a number of additional therapeutic uses. We are greatly interested in continuing our work to investigate exosome profiles in ACS to further define the mechanisms behind this pain relief therapy."

At-home Yoga Reduces Anxiety,Improves Short-term Memory

Mullen, an associate professor in the Department of Kinesiology and Community Health at the University of Illinois Urbana-Champaign, collaborated with fellow Beckman Institute for Advanced Science and Technology researchers Madhura Phansikar, Neha Gothe, and Rosalba Hernandez to design a virtual eight-week moderate-intensity yoga program geared specifically toward full-time working adults experiencing symptoms of stress.

The trial, which appeared in the Journal of Behavioral Medicine, led participants through three self-paced remote workouts each week, assessed levels of stress and anxiety in addition to executive functioning. The results showed overall decreases in stress and anxiety.

"There is some literature that has directly compared yoga to aerobic exercise, and we've known for quite a long time that aerobic exercise has benefits for the brain," Mullen said. "Our research investigates complex movements — not just riding a bicycle or walking in a straight line, but multi-planar movements that require navigating one's space a little differently and being conscious of movement, technique, and breathing."

Enter the sun salutation, a progression of yoga poses which emulates the rising and setting of the sun.

Self-paced instructional videos guided participants through sun salutations in the comfort of their own homes. Gradually, participants were encouraged to become more self-sufficient by completing the exercises independently.

"Our philosophy is to improve everyone's confidence about the exercise in which they're engaging," Mullen said. "We start slow and incrementally progress."

Researchers wanted to know if learning new chains of yoga sequences could improve working memory, similar to the brain benefits of learning a new dance.

"Having to move through multiple active postures, as opposed to static holds, should theoretically improve attentional abilities or inhibition control," Mullen said. "Going through the flow could potentially improve spatial memory."

The benefits to executive functioning observed in the study are reinforced by the literature, according to the researchers.

The study also aimed to investigate individuals' adherence to a virtual exercise program. While the study was initially designed for remote execution, its coincidental timing with the onset of the COVID-19 pandemic provided additional insight.

"The reductions in anxiety and improvements in short-term working memory suggest that it is possible to practice moderate-intensity yoga at home and still reap the benefits of reducing stress and anxiety without compromising safety," Mullen said. "[The study] really became about promoting resilience in dark times."

Another encouraging outcome was participants' overwhelmingly positive response.

"When participants are willing to recommend the program to friends and family, that's great," Mullen said. "To me, that suggests we were successful and that everyone involved had a good time."

Mullen's lab will continue to test mind-body interventions and promote adherence to exercise by developing more technologies to gamify activities like yoga, kickboxing, and other movements that are more cognitively challenging than standard aerobic exercise. Their interventions are influenced by Mullen's personal experience with flow-based training in spinning poi and martial arts like Filipino Kali and Brazilian Jiu Jitsu.

Playing Pickleball is Potentially Good for Heart

Pickleball isn't just fun and easy to play – it's also potentially heart healthy. Playing pickleball helped a small group of adults aged 65 years and older reach their recommend weekly dose of moderate to vigorous physical activity, according to a pilot study by North Carolina State University researchers.

"We know it's an enjoyable activity, but what we didn't know was: Are older adult participants getting enough moderate to high intensity activity to reach the level critical for cardiovascular health?" asked the study's lead author Jonathan Casper, associate

professor of parks, recreation and tourism management at NC State. "This pilot study provides objective data to support that pickleball participation is an activity that promotes older adults' physical activity and helps participants meet CDC and U.S. Department of Health and Human Services recommendations."

In the study, published in *Recreational Sports Journal*, researchers tracked the physical activity of 33 adults aged 65 years and older who played pickleball at least two times per week. They tracked participants' steps and intensity of physical activity during a two-week period using Fitbits.

Participants averaged 3,477 more steps on days they played pickleball, and they also spent more time engaged in "very active" and "fairly active" physical activity. They found participants averaged more than 68 minutes of moderate to vigorous physical activity per pickleball session. In addition, participants averaged 86.77 minutes in three increased heart rate zones per session.

"There are three important factors for successful healthy aging," Casper said. "No. 1 is physical health, and staying not just physically active, but engaging in physical activity where your heart rate is raised, which is called moderate to vigorous physical activity. There is also a social component, which is maintaining and creating social connections, and psychological health, or a feeling of well-being and life satisfaction."

With regard to physical activity, the CDC and U.S. Department of Health and Human Services recommend older adults should get between 150 and 300 minutes of moderate-intensity activity or 75 and 150 minutes of vigorous-intensity activity during the week. In this study, pickleball was the reason that most participants met the physical activity guideline, Casper said.

"We were able to isolate their pickleball activity versus everyday activity, and our key finding was that pickleball was the sole reason most participants were able to meet CDC standards," Casper said. "Pickleball participation was what helped them reach that threshold."

In future studies, researchers are planning to compare pickleball with other sports older adults play to understand differences in physical activity, social-psychological benefits and injury risk.

The study, "Physical Activity Associated with Older Adult Pickleball," was published in *Recreational Sports Journal.* Co-authors included Jason N. Bocarro and Nicholas R. Drake. Funding was provided by the NC State University Non-laboratory Scholarship/Research Program.

Repeated Low-level Red Light Prevents Myopia Among Children

A repeated low-level, red-light (RLRL) intervention is effective for preventing myopia among children with premyopia, according to a study published online April 26 in *JAMA Network Open.*

Xiangui He, Ph.D., from the Shanghai Eye Hospital, and colleagues conducted a 12-month school-based randomized clinical trial involving children in grades 1 to 4 with premyopia to examine the efficacy and safety of an RLRL intervention for preventing incident myopia. Children in the intervention group received RLRL therapy twice per day, five days per week, while those in the control group continued usual activities (139 children in each group).

The researchers found that the 12-month incidence of myopia was 40.8 and 61.3 percent in the intervention and control groups, respectively, representing a 33.4 percent reduction in incidence. Children in the intervention group who did not have treatment interruption secondary to the COVID-19 pandemic had an incidence of 28.1 percent, representing a 54.1 percent reduction in incidence. Significant reductions in myopic shifts in terms of axial length and cycloplegic spherical equivalence refraction were seen with the RLRL intervention (mean, 0.30 versus 0.47 mm; and −0.35 versus −0.76 D, respectively). On optical coherence tomography scans, there was no visual acuity or structural damage noted in the intervention group.

"Our findings have public health significance, especially for myopia prevention in countries with a high incidence of myopia," the authors write. "More studies are needed to understand the long-term efficacy and safety, optimal intervention dose, and potential underlying mechanisms of the RLRL intervention."

Keep abreast of upcoming medical events through this feature.
Events covered include conferences, workshops, seminars and exhibitions.

Date & Venue	Title	Contact
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18th July 2023 Melbourne, Australia	**International Conference on Tissue Science and Regenerative Medicine**	Organiser: IARF **Jeff Jones** Email: info@iarfconference.com Website: https://internationalconferencealerts.com/eventdetails.php?id=1955251
22nd July 2023 Noida, India	**Conference on Medical Ethics and Professionalism**	Organizer: ITAR **Sonali Gupta (India)** Email: info@itar.in Website: https://internationalconferencealerts.com/eventdetails.php?id=2069676
15th August 2023, Singapore	**International Conference on Prosthodontics and Orthodontics**	Organizer: Sairap **Sanjay Dsouza** Email: team@sairap.org Website: https://sairap.org/conf/index.php?id=1868760
07th -08th August, 2023 Singapore City, Singapore	**5th World Congress on Advancements in Tuberculosis and Lung Diseases**	Organizer-Conference Series LLC Ltd General : 0044-2033180199 Toll Free Number : 0800-014-8923 Email: tuberculosis@europeconferences.com
18th September 2023, Singapore	**Conference on Tissue Science and Regenerative Medicine**	Organizer: ISER **George Mathew (Abroad)** Email: info@iser.org.in Website: https://iser.org.in/conf/index.php?id=2032270
25th September 2023 Singapore,	**Conference on Plastic and Aesthetic Surgery**	Research Leagues **Kiera Jones** Email: team@researchleagues.com Website: https://researchleagues.com/event/index.php?id=2107670
28th September 2023 Taipei City, Taiwan	**International Conference on Plastic and Aesthetic Surgery**	Oraganizer: IIRST **Alex Stewart** Email: info@iirst.com Website: https://www.iirst.com/event/index.php?id=2019036

28th September 2023 Taipei City, Taiwan	**International Conference on Sports Science and Medicine**	Organizer: SCIENCENET **Sreejesh A K** Email: conference@sciencenet.co Website: https://sciencenet.co/event/index.php?id=2051635
11th October 2023 Nagoya, Japan	**International Conference on Healthcare Management and Medical Ethics**	Organized By: Science Leagues **Emma Davis** Email: info@scienceleagues.com Website: https://scienceleagues.com/events/index.php?id=2049103
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30th October 2023 Omsk, Russia	**International Conference on Lipid Science and Molecular Medicine**	Organizer: ITAR **Sonali Gupta** Email: info@itar.in Website: https://internationalconferencealerts.com/eventdetails.php?id=1893987

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The information provided through articles should add additional knowledge and be of interest to the practising doctor.

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   The article should include a structured abstract of 200-300 words.

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1. Title Page/First Page File/Covering letter

The title page of the manuscript should include the following:

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