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Editorial

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"Wijerama House", No. 6, Wijerama Mawatha, Colombo 07, Telephone: +94 112 693 324, Email: office@slma.lk

CONTENTS

SLMA President

Prof. Samath D. Dharmaratne
MBBS (Colombo)
MSc (Community Medicine)
MD (Community Medicine)
President
Sri Lanka Medical Association

President's Message

Dear SLMA Members,

Sri Lanka Medical Association is working hard to address the current shortages of drugs and equipment in the Health Sector in Sri Lanka

The Sri Lanka Medical Association (SLMA) is working closely with the Ministry of Health (MoH) to address the shortages of essential medicines and equipment facing the health sector. This has involved the support of its members living in and outside Sri Lanka. The 'SLMA Relief Fund' was set up to meet the emerging crisis, and to be a central mechanism to coordinate the donors and the health sector (recipients) to provide urgent requirements. SLMA is acting as the link between the two groups, the donors and the recipients directly, through its members and their friends, relatives, colleagues and contacts. The SLMA, being the umbrella organisation to all the colleges linked to medicine, the task has been complemented by the collaborations built through the Intercollegiate Committee chaired by the President of the SLMA.

Through the networks established by the SLMA, its members and their collaborators, possible shortages of essential medicines and related items prevalent in government hospitals are conveyed directly to the SLMA and the SLMA in turn, channels the funds, medicines and equipment that people are willing to donate quickly and with transparency to

the required institutions directly. Pledges of support have already been received from Canada, the United States of America, the United Kingdom and Australia.

The country is in dire financial straits now. Donations are coming to the country through various methods and channels. Donations that are sent to the Ministry of Health (MoH) or through the MoH are included in the Medical Supplies Division (MSD) records. The donations that are received outside the MoH, are not recorded in this system and therefore are not included in the database of the MoH. This have caused and will cause duplication and unnecessary ordering of pharmaceutical products through the MoH and by donors whilst other essentials might be marginalized. We are in the process of developing a database to include these donations, that we receive, what other colleges receive outside the MoH, in order to address this limitation as seen presently in the MoH database. The SLMA expects this process to reduce duplication and expect that this will help prevent avoidable morbidity and mortality in the country.

Sri Lanka's state health system is not only free but is also the very backbone of the people's health. We call upon everyone to support it so that it does not collapse from the current crisis. The SLMA urges the authorities to prioritize health and to allocate the last rupee or dollar left to the health sector. We at the SLMA, believe that the health system is the most important determinant between life and death of the people of Sri Lanka and urge all to help to make quite sure that it does not collapse from this current crisis affecting the country.

Professor Samath D. Dharmaratne
President - SLMA

SRI LANKAN CRISIS DEEPENS

The unprecedented political and economic crisis since independence has left Sri Lanka in a precarious situation. Sri Lanka is now classified as a bankrupt country, the first in the Asia Pacific region for the past 50 years. The month-long peaceful island wide protests turned into a black Monday on the 9th of May 2022.

The peaceful protesters at 'Mainagogama' opposite the Temple Trees and 'Gotagogama' in front the Presidential secretariat were brutally attacked by hundreds of people who emerged from Temple Trees, the official residence of the then PM. These attacks took place in the presence of a very large contingent of well-armed policemen.

This unprovoked attack on the protesters was followed by widespread violence against ministers and other ruling party members of parliament, brutally killing one parliamentarian. Violent mobs continued damaging, looting and destroying personal properties of ruling party members. Who exactly was behind this meticulously organized mayhem, is under investigation. A President that came into power pledging law and order and security of every Sri Lankan citizen could not even protect his own ruling party members. We unreservedly condemn these senseless acts of violence, whatever the provocation.

Can any of these incidents be justified? No. We do not believe this should be the case in this civilized country with a Buddhist heritage of 2500 years. Buddha preached nonviolence. Hatred will only instigate more violence and hatred, creating disharmony among the society and anarchy in the country. 'Na hi verena verani, sammantidha kudacanam, averena ca sammanti, esa dhammo sanantano1' Dhammapada Verse 5, Kalayakkhini Vatthu Hatred is, indeed, never appeased by hatred in this world. It is appeased only by loving-kindness.

The glimmer of hope we have now is because of our Courts of Law. The judges are carrying their duty in a highly commendable manner, under extremely volatile circumstances, disregarding even personal threats. This is notwithstanding the fact that the police has not been impartial in arresting the culprits.

As we write this editorial on the 24th May, we do not think the current twenty cabinet ministers with a prime minister who did not even win his own parliamentary seat during the 2019 elections is the solution. The message from the protesting citizens remains clear and unchanged for 45 days: An interim government representing all political parties represented in parliament and abolishing the presidential system within a short definite time frame. The proposal of the Bar Association of Sri Lanka in this regard has wide acceptance and can be taken as the base document.

Should the SLMA newsletter have political editorials? Some say that politics and medicine should be kept separate. As Rudolf Virchow, the German physician and father of modern pathology stated, "Medicine is a social science, and politics nothing but medicine at a larger scale". '

We think medicine is intricately entwined with politics especially at this crucial moment of economic and political turmoil in Sri Lanka. In this issue we publish two articles directly related to the present situation on: (a) Radicalization and (b) Tear Gas. Furthermore, we have updated the knowledge on common clinical topics with articles on Osteoarthritis, Diabetes Mellitus Type 2 and Internet addiction.

Professor Kumara Mendis
Dr Sumithra Tissera
Co-Editors of the Newsletter

Disclaimer: This cover story reflects the considered opinions of the Co-Editors and may not necessarily be the views of the President, Council and the general membership of the Sri Lanka Medical Association (SLMA).

Brief description of activities (16th April - 15th May)

21st April

A media release was issued by the SLMA expressing its grave concern about the current economic and political crises facing the country and its grave ill effects on the preventive/ curative health sector in the country and the citizens.

23rd April

A media seminar was organized by the SLMA to educate the public on the issues faced in the healthcare sector due to the ongoing economic crises in Sri Lanka.

The resource persons at the seminar were; Professor Samath Dharmaratne, President, SLMA, Dr Surantha Perera, Vice President, SLMA and Professor Ishan de Zoysa, Secretary, SLMA.

26th April

The monthly clinical meeting was conducted with the collaboration of the Sri Lanka College of Pulmonologists 'Role of EBUS Guided Endoscopy in Interventional Pulmonology'.

The resource persons for the seminar were; Dr Thanuja Tissera, Consultant Chest Physician (Acting), Dr EGHE de Silva, Senior Registrar in Respiratory Medicine, and Dr GLHS Liyanage, Senior Registrar in Respiratory Medicine. All resource persons were from National HRD, Welisara.

29th April

Dr Surantha Perera, Vice president, SLMA and Professor Ishan de Zoysa, Secretary, SLMA attended a meeting convened by the Bar Association of Sri Lanka (BASL) and the Ceylon Chamber of Commerce to discuss on the current political situation in the country and to forward recommendations for an early solution to the problem to be forwarded by the Professional Organizations in Sri Lanka.

30th April

The SLMA Saturday Talk on 'Approach to Chest Pain and Myocardial Infarction' was done by Dr Shanike Karunaratne, General & Interventional Cardiologist, District General Hospital, Pollonnaruwa.

7th May (Morning)

A media release was issued by the SLMA expressing its concern about the current situation in the country, methods used to disperse unarmed peaceful protesters and to bring stability to the country soon to bring stability to the country.

7th May (Evening)

The SLMA Saturday Talk on 'From Colonic Polyps to Colonic Cancer' was done by Dr Isurujith Liyanage, Senior Lecturer, Faculty of medicine, University of Sri Jayewardenepura.

8th May

A media seminar was organized by the SLMA to educate the public on the current political/ economic crises and its effects on the Health Sector and the ill effects of use of force and tear gas.

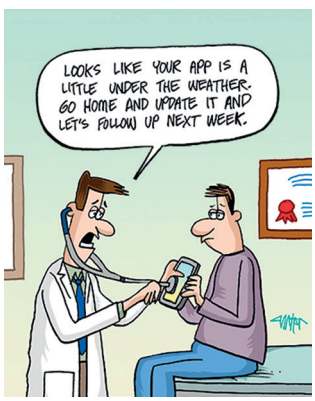
The resource persons at the seminar were; Dr. Surantha Perera, Vice President, SLMA and Professor Ishan de Zoysa, Secretary, SLMA.

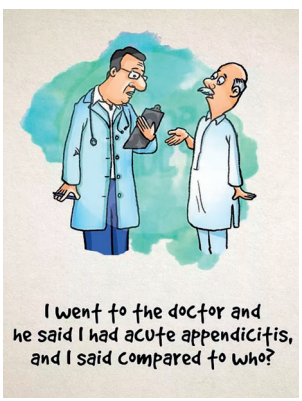
9th May

A media release was issued by the SLMA condemning the attack on unarmed civilians in front of the Prime Minister's residence and the Presidential Secretariat.

14th May

The SLMA Saturday Talk on 'Hypertension - Diagnosis to Management' was done by Dr Chamara Ratnayake, Consultant General & Interventional Cardiologist, Asiri Group of Hospitals, Colombo.





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Placing the spotlight on the radicalization process

Dr. L.L. Amila Isuru

MBBS, MDpsych, MRCPsych (UK)
Head | Senior Lecturer in Psychiatry
Faculty of Medicine and Allied Sciences
Rajarata University of Sri Lanka
Honorary Consultant Psychiatrist
Teaching Hospital Anuradhapura.

The recent incident of attacking protesters in Colombo triggered a series of violent acts across the country resulting in many deaths and damage to public and private properties. Timely intervention is needed before the country is once again sent down a slippery slope. Sri Lanka suffered serious consequences of radicalization over the last couple of decades. Black July 1983, the late nineties youth insurrection, and the north and east war that spanned 3 decades were eye-opening examples. It is sad to see that the country has not learned lessons even after losing thousands of human lives. Hence, as professionals, we have a responsibility to disseminate knowledge of the serious consequences of radicalization and the ways of prevention.

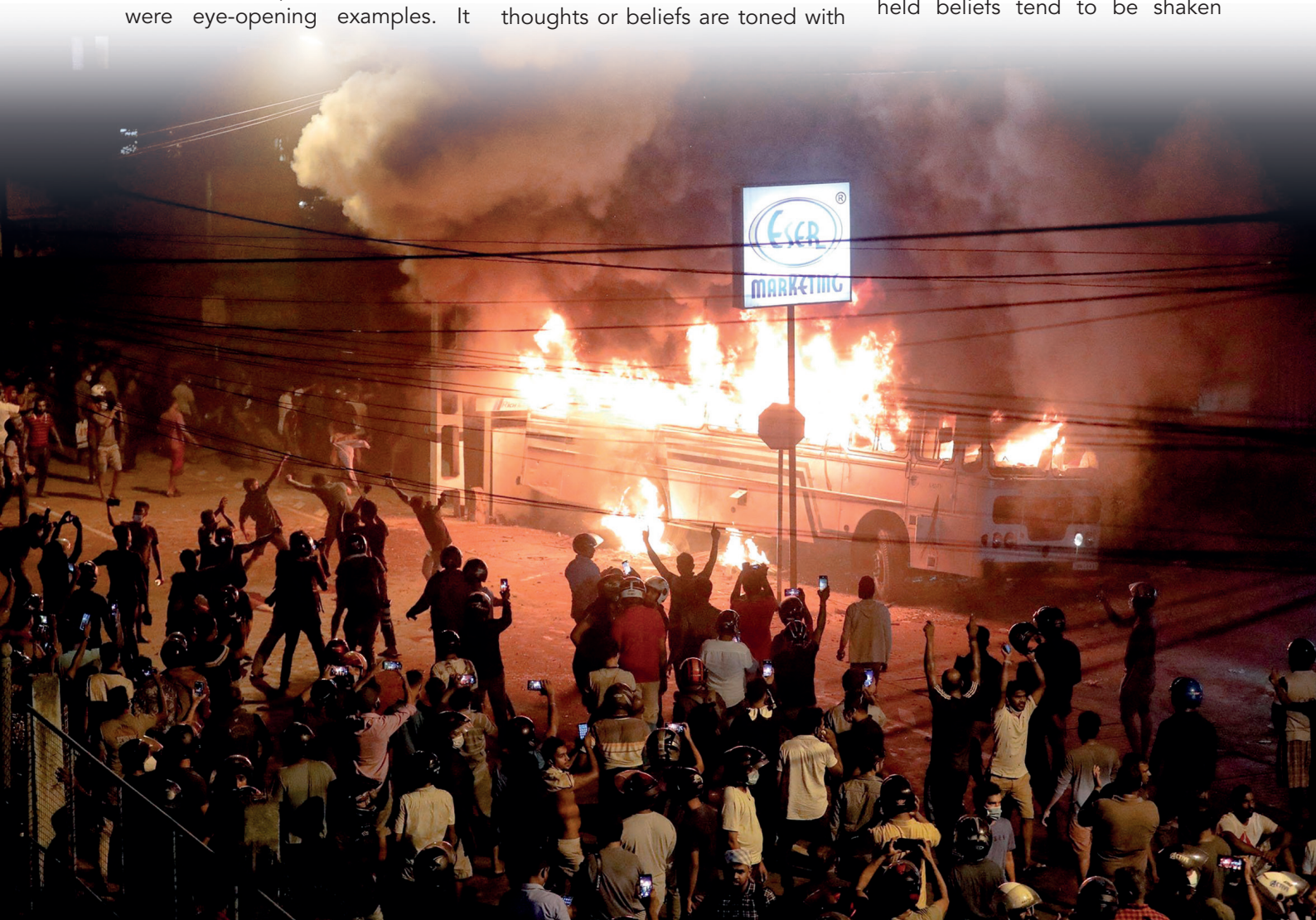
What is radicalization?

Radicalization is a process of developing extreme beliefs, emotions, and behavior. These extreme beliefs are profoundly held with strong conviction. They are not open to alternative viewpoints or others' perspectives, instead, they tend to seek information from like-minded sources. Human thoughts, emotions, and behaviors are interrelated. It is important to understand that these extremist thoughts or beliefs are toned with strong emotions. And the behavior stemming from these extremist beliefs and emotions downplays human rights, law and democracy, and fundamental values of the society. This process paves the way for violence toward nonconforming groups (Borum, 2011).

People who hold these extremist beliefs advocate the supremacy of their group, e.g. political party, ethnic group, religious group, etc. and they may exert direct or indirect coercion on other groups.

How do radicalized cognitions form?

When an individual or a community faces a socio-economic crisis, political repression, and discrimination, their previously held beliefs tend to be shaken



and become vulnerable and receptive to radicalized ideology. This notion is called the "cognitive opening"(Trip et al., 2019).

Researchers have identified factors that facilitate cognitive opening. These factors are perceived unfairness and social injustice, good and evil categorical thinking of in-group and out-group, perceived social disconnectedness and lack of belongingness with the society, collective deprivation leading to self-uncertainty, and extreme religious beliefs (Trip et al., 2019).

A catalyst event such as external provocation or a threat may trigger strong emotions and aggression in an individual or a community who holds radicalized cognitions.

Psychology of in-group love and out-group hate

Human beings, as a species, are characterized by obligatory interdependence during human evolution that may lead to the formation of ingroups. They must rely on others for information, resources, and various other services for survival. It has been shown that preferential positivity towards the ingroup does not necessarily mean hostility towards the outgroup.

Psychologists have pointed out that in the absence of scarcity of resources or realistic threats neither strong attachment to ingroup nor hostility towards out-group is formed. However, discrimination against the out-group could be solely driven by ingroup preferences in the absence of any hostile intent towards the outgroup. Conversely, hostility towards outgroups can be solely motivated by outgroup antagonism in the absence of ingroup loyalty. This tendency is commoner than we think, in fact, more virulent forms of prejudice, hostility, and racism are triggered by outgroup hostility rather than ingroup favoritism.

There are several identified factors that increased ingroup loyalty and favoritism that pave the way toward outgroup hostility and hatred (Brewer, 1999).

Moral superiority

Moral superiority leads to social hierarchy, and it is incompatible with the tolerance of difference. This may lead to mutual contempt and denigration over a long period of time. These emotions prevent cooperation between groups, rather they cause mutual avoidance and segregation. In addition to that, moral superiority provides justification for the domination of the outgroup. In such a situation, it is easy to kindle hostility, hatred, and intergroup violence between the groups (Brewer, 1999).

Perceived threat

When groups are competing for limited resources or political power, it is likely that ingroup cohesion and out-group hostility are enhanced. The threat can be realistic or unrealistic, but what is important is the perception of threat. Hence, one can manipulate ingroup loyalty and outgroup hostility through imaginary threats. This kind of manipulated hostility towards outgroups can be seen in power politics (Brewer, 1999).

Furthermore, the very factors that increase ingroup cohesion provide a fertile ground for distrust and antagonism towards out-group. The ingroup values such as moral superiority to others, perceived threats, the anticipation of interdependence under conditions of distrust, the social comparison process of groups, and party politics all conspire to enhance ingroup bonding and overt hostility towards outgroups (Trip et al., 2019).

Two pyramids model of radicalization

The relationship between attitude and behaviour is weak and this is especially evident in attitudes related to extreme behaviour. Two pyramids model of radicalization explains the radicalization of opinion separately from the radicalization of action (McCauley and Moskalenko, 2017).

1. Opinion pyramid

The opinion pyramid consists of several layers from the base to the top of the pyramid. The base of the pyramid represents the largest portion of the community, and they are neutral about the relevant cause. The next layer of the pyramid is those who believe in the cause but do not justify violence. Then those who believe in violence in defence of the cause, but do not break existing law and order. People who represent the apex of the pyramid are lesser in number, but they feel a personal moral obligation to take up violence in defence of the cause (McCauley and Moskalenko, 2017).

2. Action pyramid

The base of the action pyramid represents the largest proportion of people in the community and they do nothing for the relevant cause. The next level of the pyramid represents individuals who engage in activities within the legal framework. Then the individuals who are engaged in illegal activities and the apex of the pyramid represents the individuals engaged in illegal activities that target civilians (McCauley and Moskalenko, 2017).

Individuals in each layer of the pyramid move up and down. Internal factors such as personality difficulties, impulsivity, traumatic childhood, and psychoactive substance use facilitate individuals moving up in the direction of the

radicalization process. External factors such as threats, collective deprivation, psychosocial stressors, injustice, discrimination, and social exclusion lead to moving up towards the apex of the pyramid. Social inclusion, psychosocial support, equal opportunities, fairness, and social justice help to inhibit the process of radicalization at an individual or a community level (Borum, 2011).

The relationship between frustration and aggression

The economic crisis and political instability in Sri Lanka has caused a huge impact on the daily life of people in the country. People are struggling to find basic needs and their standards of living are negatively affected.

Frustration aggression theory explains how aggressive behaviour stems from frustration.

However, Dollard et al. have stated that frustration can give rise not only to aggression but also to depression, anxiety, and prejudice. It was shown that frustration produces aggressive inclination only if it causes negative affect in a person. It is the negative affect, not frustration that causes aggressive tendencies. There are several factors that trigger aggressive behavior in a frustrated individual. These triggers can be internal factors in the frustrated individuals or external factors some of which can be modified. Hence, the negative affect produced by frustration does not automatically lead to aggressive behavior. This internal process can be triggered by the emotional instability of an individual or can be inhibited by social norms/ values and visible repercussions of violence (Breuer and Elson, 2017).

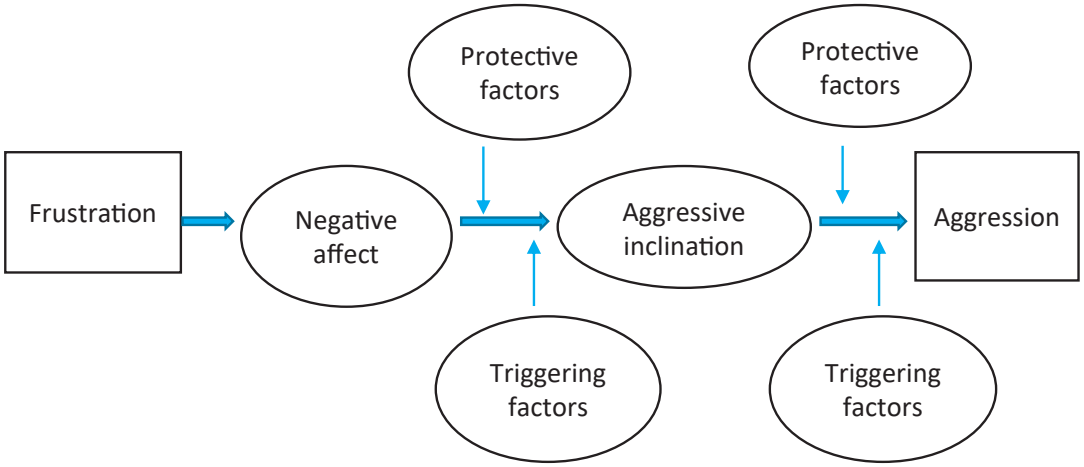


Illustration of frustration-aggression hypothesis

Triggering factors - emotional instability, impulsivity, aggression personality traits,

Protective factors - a reappraisal of situation, social norms, visibility of aftermath of aggression

Psychology of aggression in mobs and crowds

Researchers have pointed out that people often behave differently in a crowd than when alone. This psychological phenomenon is called deindividuation in which individual in a crowd feels that they have lost their personal identity and merges into a group identity. Hence, deindividuation creates a state of increased sensitivity to situation-specific social norms linked with the group. This tendency may increase aggression when group norms are aggressive or reduce when group norms are benign (Vilanova et al., 2017).

Deradicalization

It has been shown that understanding and implementing the deradicalization process can prevent unthinkable consequences of radicalization.

There are several strands of deradicalization described in the scientific literature (Trip et al., 2019).

1. Understanding the psychology of the process of radicalization, deindividuation, ingroup outgroup dynamics.
2. Understand the facilitatory and inhibitory factors of the radicalization process. This information can be helpful in deradicalization programs
3. Role of family, peers, and friends in the deradicalization

process- research describes the role of family and social networks in radicalization and how they contribute to the deradicalization process. They can get the radicalized individual to rethink, provide a broader view of the matter at hand and mobilize necessary psychosocial support (Ellefsen and Sandberg, 2022).

4. Learning and practicing democratic competencies has been shown to reduce radicalization in the long run in a community (Ashour, 2015).

Four democratic competencies for deradicalization

Values	human dignity and human rights, cultural diversity , democracy, justice, fairness, equality, and the rule of law
Attitudes	openness to cultural otherness, respect, civic-mindedness, and tolerance to ambiguity
skills	autonomous learning, analytical and critical thinking, listening and observing, empathy, communicative, and conflict-resolution skills
Knowledge and critical thinking	politics, law, human rights, religions, history, environment, and cultures

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What is Tear Gas? Are we quite familiar with it?

Dr Sajith Edirisinghe

Senior Lecturer in Anatomy
Faculty of Medical Sciences
University of Sri Jayewardenepura

Professor Clifford Perera

Chair Professor of Forensic Medicine
Faculty of Medicine
University of Ruhuna

Dr Udara Senarathne

Lecturer in Biochemistry and Senior Registrar in Chemical Pathology
Faculty of Medical Sciences
University of Sri Jayewardenepura

Dr Neluwa-Liyanage R. Indika

Lecturer in Biochemistry
Faculty of Medical Sciences
University of Sri Jayewardenepura

What is tear gas?

Chemical demonstration-control agents (DCAs) are one method used by law enforcement to manage crowd behaviour. The intention of these agents is to cause crowd dispersal or to change the crowd's movement trajectory. Chemical DCAs are commonly referred to as tear gas. However, "tear gas" is a blanket term that refers to a number of different chemical agents that cause irritation of the eyes, nose, skin, throat, and lungs, as well as lacrimation. (Brown et al, 2021)

Based on the available toxicological evidence, tear gas is considered to be a 'sublethal incapacitant' with several clinical side-effects which are anticipated (Rothenberg C. *et al.* 2016). Although commonly referred to as a 'gas', the biologically active compounds in tear gas are categorized as solids. The main chemical compounds include o-chlorobenzylidene malononitrile (CS), oleoresin capsicum (OC, pepper spray), dibenz [b,f]1,4- oxazepine (CR), and 1-chloroacetophenone (CN) [figure 01] (Rothenberg C. *et al.* 2016). OC is a cocktail of several active compounds extracted from peppers having capsaicin as the main active ingredient. The tear gases can be deployed as sprays in a liquid form or as grenades and canisters in a powdered form that is aerosolized as smoke or fog. (Schep LJ *et al.* 2013)

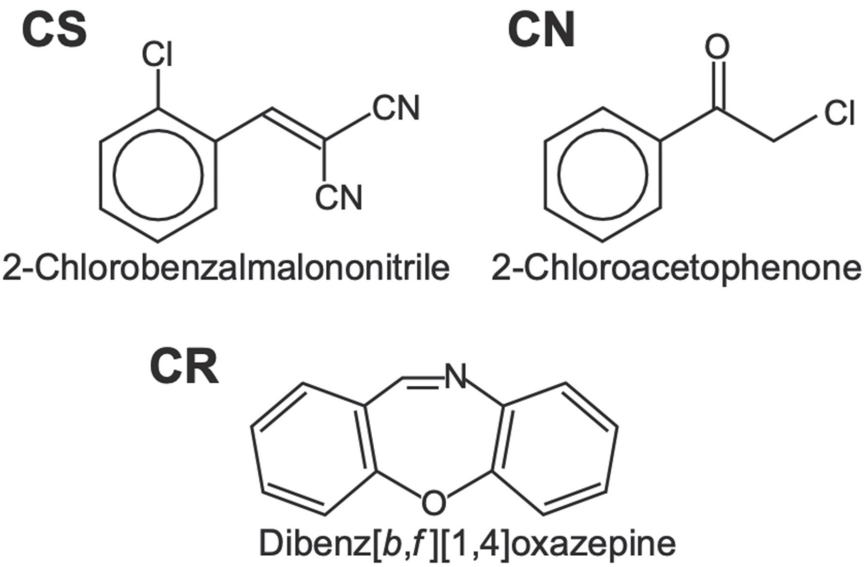

Figure 01: Chemical structures of commonly used tear gas agents o-chlorobenzylidene malononitrile (CS), 1-chloro- acetophenone (CN), and dibenz[b,f]-1,4-oxazepine (CR). (Image credit: Rothenberg C. *et al.* 2016)

How does tear gas work on human tissue?

Even though there are different formulations of tear gas, all were found to act on transient receptor potential (TRP) channels. TRPs are a group of cationic channels that transfer the signal by altering membrane potential or intracellular calcium concentration. TRP channels are further divided into six subfamilies: TRPA (Ankyrin), TRPC (Canonical), TRPML (Mucolipin), TRPM (Melastatin), TRPP (Polycystic), and TRPV (Vanilloid) (Samanta et al., 2018). In the sub-family TRPA, subtype TRPA1 is heavily expressed in nociceptors (*nociceptors are free nerve endings found in the skin, muscle, joints, bone, and viscera), detects signals from damaged tissue or the threat of damage. It also responds to chemicals released from the damaged tissue*). Stimulation of TRPA1 causes a sensation of burning heat and pain (Everaerts et al., 2011). Animal studies conducted using mice with TRPA1 gene deletions have exhibited no pain-related behaviour during exposure to CN or CS (Rothenberg et al., 2016). When CS interacts with TRPA1 mucocutaneous sensory nerve receptors, it can cause severe facial pain with reflex blepharospasm and lacrimation (Brvar, 2016). CS, CN, and CR gases are 10,000 times more potent on TRP receptors than other natural stimulators. Among

the traditional tear gasses, CR is the most potent TRPA1 stimulator (Gijsen et al., 2010).

Capsaicin is the active component of pepper spray. The capsaicin's target is a vanilloid TRP target called TRPV1, which is heavily seen on peripheral sensory nerves, skin, conjunctiva, cornea, and the mucous membranes of the upper and lower airways. TRPV1 also gets activated when nerve endings are exposed to noxious heat, acting as a thermal warning sensor for imminent tissue damage. Acidification can also lead to sensitization or activation of TRPV1 (Rothenberg et al., 2016). In addition to pain, the TRPA1 and TRPV1 receptors are common pathways for inflammatory signalling (Schep et al., 2015).

Health effects of tear gas

Exposure to tear gas can result in a spectrum of health effects, both acute and chronic. They can be more broadly classified into chemical, thermal, and mechanical effects (Alhillo et al., 2018). Studies have identified specific receptor-mediated mechanisms medicated by capsaicin, CS, CN, and CR targeting the ion channels TRPV1 and TRPA1 as mentioned above. CN is the most toxic lacrimator and at high concentrations has caused corneal epithelial damage and chemosis. CS is a 10-times more potent lacrimator than CN but is less systemically toxic (Blain, 2003). Worldwide, CS teargas is one of the most commonly used tools for crowd-control. Exposure to CS teargas is known to have consequences on protesters' health (i.e., eye and skin irritation, respiratory problems etc). Sri Lankan Police used CS tear gas manufactured in China to disperse multiple mobs in Colombo in recent weeks. The tear gas use of Police to disperse protesters was a common scenario in the city of Colombo during the decade of 1980s. Some victims of such events were treated at the then Accident Service of the General Hospital, Colombo for minor complaints. However, Sri Lankan medical literature has not recorded major tear gas related health incidents or fatalities up to now.

The eyes and respiratory systems are the primary target organs, with onset of ocular and respiratory tract irritation occurring within 20 – 60 seconds (Schep et al., 2015).

The immediate and chronic effects of exposure to tear gas are listed in table 1. Although there are several studies conducted on acute and chronic adverse health effects of tear gas exposure, the common shortcoming observed in all the studies is that they were based on laboratory animals or healthy individuals under controlled conditions (Rothenberg C. *et al.* 2016). Because individuals of variable health status are exposed to tear gas in its deployment in riots or instances of large-scale civil disorder, many experts argue that controlled research is inadequate for safety assessment. Adding to the inadequacy of current evidence, it is noteworthy that individuals can be exposed to tear gas repeatedly for a longer duration in situations of public unrest, which is vastly different from the controlled conditions maintained in research studies. Furthermore, respiratory effects had been observed in residents of the areas where tear gas was deployed, implying its potential for being an environmental health hazard. (Rothenberg C. *et al*. 2016)

Figure 02 - Tear Gas in action (Photograph by Mr Pamudith Karunarathne)

According to a systematic review of 31 studies on chemical irritants used for crowd control, from 11 countries that reported on a total of 5131 people, two subjects died, and nearly 1% sustained permanent disabilities. One of the cases died of respiratory failure after 2-chlorobenzalmalonitrile aerosol was fired inside his home, while traumatic brain injury caused the death of the other. Out of all documented injuries, with multiple injuries occurring in each individual, 8.7% were severe (e.g. major head injury and vision loss); 17% being moderate and 74.3% were minor. Most injuries were associated with

Table 01 – health effects of tear gas

Organ/ System	Immediate effects	Chronic effects
Eyes	Pain and irritation, itching, burning sensation Lacrimation Blepharospasm Inflammation of the conjunctiva Corneal stromal edema Conjunctival tearing Photophobia, conjunctivitis, Periorbital oedema, eyelid erythema Temporarily inhibition of the blink reflex Limited responsiveness to mechanical and chemical stimuli to the eye	They do not typically cause irreversible eye effects, but more severe ocular injuries have been reported. Hyphema, Corneal neovascularization, Vitreous haemorrhage, Necrotising keratitis, coagulative necrosis, Traumatic optic neuropathy, Symblepharon Pseudopterygium, Infective keratitis, Trophic keratopathy Glaucoma, Cataracts and loss of sight
Nasal cavity & Olfactory	Irritation	
Mouth	Irritation Choking Salivation	
Skin	Irritation, itching & redness Stinging Blistering Allergic contact dermatitis	
Respiratory tract	Coughing Chest tightness Acute exacerbation of asthma Pulmonary oedema, apnoea, & respiratory arrest (capsaicin infiltration into LRT) Haemoptysis	Chronic bronchitis High risk of presenting with acute respiratory illness Increased risk of respiratory infections Chronic obstructive pulmonary disorder (COPD)
Gastrointestinal tract	Nausea & vomiting Diarrhoea Hematemesis	
Cardiovascular	Tachycardia Transient hypertension Cardiac arrhythmias	

the skin and eyes. Among the identified exacerbating factors of injuries are, using the weapons in confined spaces, use of chemical irritants in areas with high heat or humidity, windy conditions, use of higher quantities of chemicals, prolonged exposure time, and direct targeting of the face and eyes (Haar et al., 2017).

First aid

In the absence of a specific antidote to tear gas exposure, first-aid measures should be adopted immediately. The victim should leave the scene immediately to prevent further exposure. Contaminated clothes, shoes, accessories, and contact lenses should be removed and washed well since all untreated particles can remain active for up to a week. Bathing and washing the body vigorously with soap and water can remove remaining particles that adhered to the skin. The eye should be irrigated with water or saline, with a copious amount of liquid being used for a prolonged period. If using water, it should be cold, to minimize the reactivation of particles. Anticholinergics and antihistamines may be used to reduce lacrimation and decrease salivation while oral analgesics may help relieve eye pain (Hon et al., 2020).

The Practical Guide for Medical Management of Chemical Warfare Casualties published by Organisation for the Prohibition of Chemical Weapons(OPCW), International Cooperation and Assistance Division, Assistance and Protection Branch in 2019 give a lengthy explanation on medical management.

(https://www.opcw.org/sites/default/files/documents/2019/05/Full%20version%202019_Medical%20Guide_WEB.pdf).

Figure 03 - Police use water cannon and tear gas to disperse protesters in Colombo, Sri Lanka, May 6, 2022. (Photograph by AFP)

Historical context for tear gas use

The 1925 Geneva Protocol has a specific exception for domestic use of chemical weapons. The protocol, officially titled the "Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare", prohibits the use of "asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices" in warfare (Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare (Geneva Protocol) 1925). However, this prohibition does not extend to the use of chemical DCAs within the borders of a sovereign nation against its own citizens. Thus, law enforcement is empowered to use chemical DCAs for riot control. Chemical DCA policy in the United States has little grounding, outside of historical pressures and manipulated scientific reports.

Until 1975, the United States made a provision for the deployment of tear gas in war (especially as used in the Vietnam War) but reversed that decision after international pressure ("United States of America: Ratification of 1925 Geneva Protocol" 1975). The Chemical Weapons Convention treaty of 1993 clarified the procedures within the Geneva Protocol. This treaty specifically prohibits the production and use of chemical weapons. However, it too still allows for the use of Riot Control Agents, which it defines as "any chemical...which can produce rapid human sensory irritation or disabling physical effects which disappear within a short time following termination of exposure" ["Customary IHL - Practice Relating to Rule 75. Riot Control Agents" 1993] (Brown et al, 2021).

Tear gases are not currently considered as chemical weapons by Western countries. Since the 1950s, they have been mainly used by law enforcement agencies for crowd control purposes in most European countries, including the United Kingdom, France, Germany, and Switzerland. Tear gases are also used in military training exercises to test the rapidity or efficacy of protective measures in the event of a chemical attack.

Medical consequences of the use of riot control agents remain ill-defined in terms of morbidity and mortality. In 1998 an editorial in the Lancet demanded a moratorium on the use of such agents so that the potential long-term consequences of these substances could be studied further, in particular in the area of carcinogenicity. Yet for all that, approximately 25 years since then, we still lack such information.

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Osteoarthritis in 2022: current knowledge into every day practice

Dr. Kalum Deshapriya

MD, FCCP
Consultant Rheumatologist,
Teaching Hospital Karapitiya,
Galle.

Introduction

Osteoarthritis(OA) is still considered as a disease entity which has minimal therapeutic options. As a result of this attitude the majority of patients are not getting what they deserve or are subjected to many management strategies without sound supportive evidence. This is especially unfortunate as OA is considered one of the leading causes of chronic musculoskeletal pain and disability. Published data on global burden of diseases 2017 indicate the increasing trend of musculoskeletal disorders. (1) Even though there are some concerns regarding the collection of data in this document (2), this observation has been endorsed by many other publications. Disability due to osteoarthritis is more prominent in the elderly population, which is growing. According to multiple site COPCORD (community oriented program for control of rheumatic diseases) India population surveys 2005-2011 using a clinical diagnosis approach, OA was the second most common musculoskeletal disease behind soft tissue rheumatism. (3) (Source: http://www.copcord.org).

What is Osteoarthritis?

This is the most common type of "arthritis". It is characterized by damage to articular cartilage, remodeling of adjacent bone and associated inflammation. This occurs as a result of genetic, biomechanical and metabolic factors. When the natural repair process cannot compensate for the damage, symptomatic OA will be the outcome. OA leads to alteration in all tissues in a joint: muscles, ligaments, bursa, joint capsule, synovial membrane, subchondral bone and cartilage.

Pathogenesis of OA is complex and various mechanisms have been described. Abnormal stress and loading cause mechanical damage while obesity leads to metabolic inflammation via adipokines. Other mechanisms involved are; matrix degeneration by metalloproteinase, regulation of subchondral remodeling by Osteoprotegerin (OPG), RANK and RANK ligand (RANKL), production of Aggrecanase and pro inflammatory mediators like interleukin-1 (IL-1) and and tumour necrosis factor-alpha (TNF-α). ***Chondrosenescence*** is a new term introduced to describe the age-dependent chondrocyte function abnormalities leading to cartilage dysfunction in OA. (4) Other age related contributory factors are, sarcopenia, muscle weakness and loss of proprioception and balance.

Main pathological features of OA:

- cartilage degradation
- bone remodeling
- osteophyte formation
- synovial inflammation

Diagnosis of OA

Knees, hips and small hand joints are the commonly affected joints. Even though the pain in OA is typically mechanical in nature, pain due to synovial inflammation is now well established. OA is largely a clinical diagnosis. Laboratory investigations are helpful mainly to exclude other causes of joint involvement. X-ray provides useful information in establishing the diagnosis together with clinical findings. However, there is poor correlation between the symptoms of OA and X-ray finding.

Risk factors associated with knee OA (5)

- age over 50 years
- female gender
- higher body mass index
- previous knee injury or malalignment,
- joint laxity
- occupational or recreational usage
- family history
- presence of Heberden's nodes

Pain in knee OA is usually usage-related and mechanical type, often worse towards the end of the day, relieved by rest. Even if the X-ray is normal one can make a confident diagnosis of OA in a patient over the age of 40, if the patient has usage-related knee pain, short lasting morning stiffness, functional impairment and one or more typical examination findings like crepitus, painful and/or restricted movement or bony enlargement. (5) Absent or moderate knee effusion, fixed flexion and/or varus deformity, joint line tenderness and instability can also be seen on examination.

Current gold standard for assessment of knee OA is plain radiography. The typical views used are both knees, weight bearing, semiflexed PA (MTP) view, plus a lateral and skyline view.

Classical radiological features of knee OA

- joint space narrowing
  - » characteristically asymmetric
  - » medial compartment more commonly involved.
  - » Seen in many other conditions making it least specific
- osteophyte
- subchondral bone sclerosis
  - » sclerotic changes occur at joint margins
  - » may not be apparent if severe osteoporosis is present
- subchondral 'cysts'

MRI and ultrasound are seldom useful in special situations when the cause of knee pain is not clearly evident. Synovial fluid analysis is necessary when an alternative diagnosis like infection or crystal induced arthritis is suspected. In OA leucocyte count is non inflammatory and typically below 2000/mm^3.

Management

With the improved knowledge of the pathophysiology of OA and availability of research data on the behavior of OA more therapeutic options are available now. However, there is a general negative attitude towards the options available for management of OA among general population and also among medical professionals. One common reason for this is the long standing established belief that *"OA is part of the normal ageing process and you have to accept it"*. It is time to change this and patients should get the benefit of current evidence available on management of OA.

Engaging with the patient

Good doctor –patient relationship, constant encouragement, educating the patient that there are many non-surgical options available, will help alleviating their doubts, building their confidence and engaging in treatment. Whole process of managing OA should be a shared decision making between the patient and their family members or carers. Refer to principles in the NICE guideline on shared decision making (https://www.nice.org.uk/guidance/ng197). Compared to many other musculoskeletal diseases managing OA is more challenging mainly due to established negative attitudes.

Treatment decisions should be taken considering patient's beliefs and preferences. Patients should be assessed for other medical conditions, such as hypertension, cardiovascular disease, heart failure, gastrointestinal bleeding risk, chronic kidney disease.

These are some of the suggestions highlighted in recent literature on how to explain OA to your patient.

- explain osteoarthritis adequately as a disease that affect whole joint including soft tissues
- assess the severity of disease in individual patient and don't just give simple reassurances
- explain about the risk factors relevant to your patient
- explain that OA is not necessarily progressive in all patients
- explain that there are many things can still be done without considering joint replacement

Current Evidence Based Therapeutic Options

These include lifestyle modifications (exercise, dietary modifications and weight reduction, correct postures and gait and appropriate footwear), physical therapy, psychosocial approaches and pharmacological interventions. Apart from the patient and family members, other professionals like, physiotherapists, occupational therapist, nutritionists and prosthetits & orthotists are members of the team.

Non Pharmacological Management

Exercise

Many patients believe that the exercise could worsen the disease. Exercise can reduce pain and stiffness, increase muscle strength,

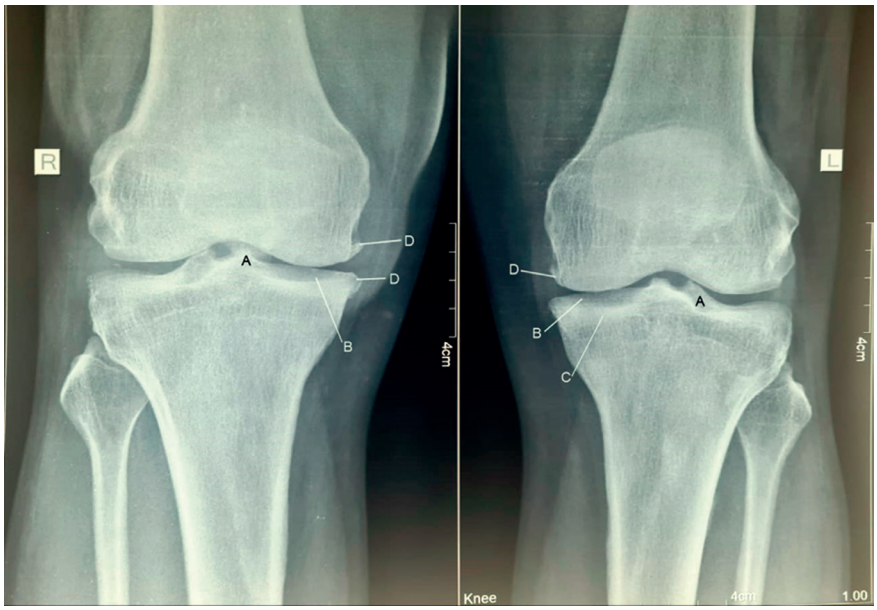

Fig 1. Radiological findings of OA. sharpening of the tibial spines (A), bilateral medial tibio-femoral compartment narrowing (B), sub chondral sclerosis(C) and osteophytes (D)

increase mobility, fitness and balance, reduce depression and anxiety. Current evidence strongly recommend exercise for patients with knee, hip, and hand OA regardless of age, comorbidity, pain severity or disability. (6,7) There are a variety of exercise options available. What is the best and ideal amount of exercise is not clear. Walking, strengthening exercises, neuromotor exercises and aquatic exercises are recommended in OA. There are precautions that should be taken. One has to be cautious about the ground, footwear and pain and extreme movements and overstretching should be avoided.

Tai Chi and Yoga

Mind-body exercise like Tai Chi and Yoga are considered to be effective and safe for all patients with OA. Tai Chi is strongly recommended while Yoga is conditionally recommended. (6)

Weight reduction

A positive response has been noted with weight reduction and symptom or functional improvement. (6)

Walking stick

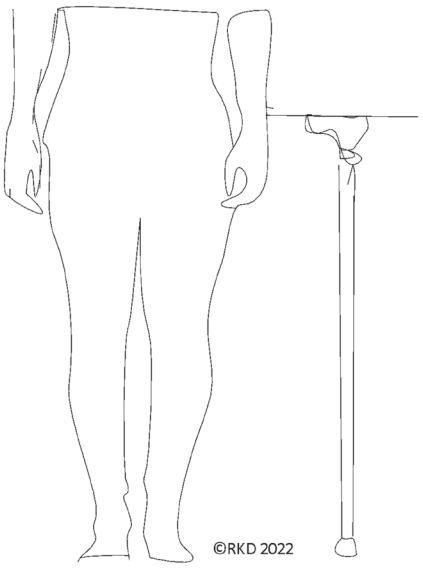

Fig 2. Correct height of the stick. Top of the handle is in line with the crease of wrist and held at opposite side of affected leg

Assistive device is a strong recommendation in patients with knee OA in whom one or both joints are affected leading to significant pain and walking difficulty. It is important to give correct advice regarding the height of the cane and which hand to be used.

Thermal interventions

Use of local heat or cold can be used as an adjunct to core treatment. Electrically generated heat (short wave diathermy) and ultrasound are other heat modalities. Transcutaneous electrical stimulation (TENS) is strongly recommended against in knee and hip OA.

Tibiofemoral knee braces

If there is a large impact on ambulation, this is strongly recommended.

Taping

Evidence is not strong but conditionally recommended.

Insoles and other specialized footwear

There has been an interest in the use of insoles in the past but there is no good evidence to support. This is now not recommended in most guidelines.

Massage therapy and manual therapy are not recommended while efficacy of acupuncture is controversial.

Pharmacological Management

Topical NSAIDs and Capsaicin

As a medication with least systemic exposure recent evidence strongly support the usefulness of topical NSAIDs in OA. Topical capsaicin also has shown benefit in recent literature.

Oral NSAIDs and Acetaminophen

With the improved knowledge of pathophysiology of OA, oral NSAIDs have become the main stay of pharmacological management. Now this is strongly recommended in all guidelines. Contrary to the long standing belief of Acetaminophen as the main pharmacological option, most studies have failed to show benefit. However, this may still be useful as a short term option when the patient has intolerance or contraindications to NSAIDs.

Tramadol and Non-tramadol opioids

When the patient cannot use NSAIDs or when other therapies failed or there is no place for surgical options one can use tramadol. It is recommended that this is only for a period of 2 months to 1 year and not longer than that. Non-tramadol opioids are not recommended.

Glucosamine and Chondroitin sulfate

Glucosamine is one of the most commonly prescribed dietary supplements in OA due to lack of toxicity and popular perceived efficacy. There is strong evidence to its ineffectiveness. This is strongly recommended against in the management of OA. Chondroitin sulfate is also loo him not recommended in OA due to lack of evidence for its efficacy.

Intra articular hyaluronic acid, Platelet-rich plasma treatment and Stem cell injections

These are popular therapeutic option in the recent past. However, there is no convincing evidence to prove their efficacy. These options are now strongly not recommended.

Colchicine, fish oil, vitamin D, bisphosphonates, Hydroxychloroquine, Methotrexate and Intra articular botulinum toxin

Intervention	Joint		
	Hand	Knee	Hip
Exercise			
Balance training			
Weight loss			
Self-efficacy and self-management programs			
Tai chi			
Yoga			
Cognitive behavioral therapy			
Cane			
Tibiofemoral knee braces		(Tibiofemoral)	
Patellofemoral braces		(Patellofemoral)	
Kinesiotaping	(First carpometacarpal)		
Hand orthosis	(First carpometacarpal)		
Hand orthosis	(Other joints)		
Modified shoes			
Lateral and medial wedged insoles			
Acupuncture			
Thermal interventions			
Paraffin			
Radiofrequency ablation			
Massage therapy			
Manual therapy with/without exercise			
Iontophoresis	(First carpometacarpal)		
Pulsed vibration therapy			
Transcutaneous electrical nerve stimulation			

Strongly recommended
Conditionally recommended
Strongly recommended against
Conditionally recommended against
No recommendation

Table 1. Recommendations for the non pharmacologic management of osteoarthritis of the hand, knee, and hip (Source: 2019 American College of Rheumatology/Arthritis Foundation Guideline for the Management of Osteoarthritis of the Hand, Hip, and Knee)

Intervention	Joint		
	Hand	Knee	Hip
Topical nonsteroidal antiinflammatory drugs			
Topical capsaicin			
Oral nonsteroidal antiinflammatory drugs			
Intraarticular glucocorticoid injection			
Ultrasound-guided intraarticular glucocorticoid injection			
Intraarticular glucocorticoid injection compared to other injections			
Acetaminophen			
Duloxetine			
Tramadol			
Non-tramadol opioids			
Colchicine			
Fish oil			
Vitamin D			
Bisphosphonates			
Glucosamine			
Chondroitin sulfate			
Hydroxychloroquine			
Methotrexate			
Intraarticular hyaluronic acid injection	(First carpometacarpal)		
Intraarticular botulinum toxin			
Prolotherapy			
Platelet-rich plasma			
Stem cell injection			
Biologics (tumor necrosis factor inhibitors, interleukin-1 receptor antagonists)			

Strongly recommended
Conditionally recommended
Strongly recommended against
Conditionally recommended against
No recommendation

Table 2. Recommendations for the pharmacologic management of osteoarthritis of the hand, knee, and hip

(Source: 2019 American College of Rheumatology/Arthritis Foundation Guideline for the Management of Osteoarthritis of the Hand, Hip, and Knee)

have not shown improvement in pain or functional outcomes and are not recommended in OA. Similarly, tumor necrosis factor inhibitors and interleukin-1 receptor antagonists are also not recommended.

New developments in research and future prospects

There is currently no cure for osteoarthritis. Researchers are engaged in developing various new treatment targets. So far it is not possible to improve regenerating potential for damaged articular cartilage. It is a long felt requirement to develop disease-modifying osteoarthritis drugs (DMOADs) to alleviate pain, to improve function and to delay the structural progression of the disease. Following is a list of few potential future directions in improving the outcome of OA

- Inactivation of epidermal growth factor receptor (EGFR) shown to accelerate OA. Inhibiting EGFR will act as a DMOAD.
- Stanozolol androgenic anabolic steroid acted favorably in reducing pain and improved weight bearing in animal studies.
- Tanezumab and Fasinumab are antibodies directed against NGF (nerve growth factor) studied as DMOADs
- Using Artificial Intelligence (AI) in developing algorithms to predict OA progression.

Key points

- OA is a disease which has many therapeutic options to improve patient's quality of life
- Management of OA involves multiple professionals and shared decision between the doctor and the patient is important
- Exercise should be prescribed to all regardless of age, comorbidity, pain severity or disability
- Correct use of walking stick can improve the pain and the function
- Benefits of oral and topical NSAIDs are well established and Acetaminophen is no more the first choice
- Contrary to the common popular belief, glucosamine, intra articular hyaluronic acid, Platelet-rich plasma treatment and Stem cell injections has no place in the management

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Evidence-based management of Diabetes Mellitus

Dr. Neomal De Silva

MBBS, MD
Senior Registrar in Endocrinology,
National Hospital of Sri Lanka

Dr. Dulani Kottahachchi

MBBS, MD, MRCP
Consultant Endocrinologist & Senior Lecturer,
Faculty of Medicine,
University of Kelaniya,
Chairman,
Sri Lanka Diabetes Federation

Introduction and pathophysiology

Diabetes mellitus is a state of chronic hyperglycaemia, which leads to the production of advanced glycated end products and activation of various metabolic pathways resulting in microvascular and macrovascular complications. Type 1 diabetes is due to autoimmunity induced destruction of beta cells of the pancreas. In type 2 diabetes there is resistance of end organs such as liver, adipose tissue and muscle, to the action of insulin, leading to compensatory hyperinsulinemia. Even in type 2 diabetes there is an element of beta cell failure which starts very early in the disease process. However, many other mechanisms such as decreased incretin effect in the gut, increased lipolysis in adipose tissue, increased glucose reabsorption in the kidney, decreased glucose uptake in muscles, neurotransmitter dysfunction in brain, increased glucagon production in the pancreas and increased glucose production by the liver, also play a role in the pathogenesis of type 2 diabetes mellitus (1).

Epidemiology

Diabetes is a global pandemic and a major public health concern. Approximately 537 million adults in the world live with diabetes. About 75% of them live in low and middle-income countries and almost 50% of them are undiagnosed. Diabetes caused 6.7 million deaths worldwide and at least 966 billion USD in health expenditure (2).

In an island-wide study conducted in 2008, the prevalence of diabetes in Sri Lanka was 10.3% (3). However, recent studies have indicated that as much as 27.6% of the population in Colombo district have diabetes and 30.3% have pre diabetes (4). This means that more than half of the population in the urban areas have some form of dysglycaemia.

Diagnosis

Investigation	Cut off
Fasting plasma glucose*	>= 126 mg/dL
2-hour plasma glucose during 75 g oral glucose tolerance test	>= 200 mg/dL
HbA1c**	>= 6.5%
Random plasma glucose***	>= 200 mg/dL

Table 1: Diagnostic criteria for diabetes mellitus (5)

*Fasting is defined as no calory intake for at least 8 hours.

**The test should be performed in a laboratory using a method certified by NGSP and standardized to the DCCT assay.

*** In a patient with classic symptoms of hyperglycaemia or hyperglycaemic crisis.

In the absence of unequivocal hyperglycaemia diagnosis requires two abnormal results from the same sample or in two separate samples.

Benefits of glycaemic control

Multiple trials such as UKPDS, DCCT, ACCORD, ADVANCE and VADT have evaluated the long-term benefits of glycaemic control. They have shown that tight blood glucose control leads to reduction of microvascular complications. Benefits of tight control in the initial stage of diabetes persist for many years even if the glycaemic control has deteriorated subsequently. This is known as legacy effect or metabolic memory. Benefit of strict glycaemic control on macrovascular complications become apparent only in long-term follow up, over 10 to 20 years later. Very tight blood sugar control in older adults with established cardiovascular disease and multiple complications may be detrimental due to increased risk of hypoglycaemia (6).

Management of diabetes

Management of diabetes has 3 main components; life style modifications and diabetes health education, medical nutrition therapy and pharmacological management.

Life style modifications and diabetes health education

At least 150 minutes per week of moderate intensity physical exercise is recommended for adults with diabetes mellitus. Prolonged sitting and sedentary life style should be avoided. Advice and support should be provided for smoking cessation. All patients with diabetes should undergo a structured education programme on diabetes self-management.

Medical nutrition therapy

Medical nutrition therapy is the cornerstone of diabetes management. Encourage patients for a healthy and pleasurable eating pattern to achieve and maintain healthy body weight, glycaemic targets and metabolic goals.

Providing a meal plan based on cultural and personal preferences, health literacy and affordability, availability and accessibility, is quite important.

Plate method has been the widely used technique. The plate method encourages a balanced meal with non-starchy vegetables, green leaves (1/2 of the plate), protein-rich foods such as fish, white meat and pulses (1/4 of the plate), grains and starchy vegetables (1/4 of the plate). Consumption of such a mixed meal effectively reduces the glycaemic index of the starchy food and reduces post-meal glucose excursions.

Plate model and examples

Encourage patients to distribute total calories consumed on a day into 3 main meals and 2-3 snacks and advise that fruits are best consumed as a snack in between main meals rather than as a dessert. Minimising the intake of refined sugars, sugary foods (candy, cookies, cakes etc.) and sugar sweetened beverages will improve blood glucose levels. But always remember to individualize the medical nutrition therapy and seek assistance from Clinical Nutritionists, especially when diabetes patients have developed complications such as chronic kidney disease.

Pharmacological management of type 2 diabetes

Metformin should be the initial drug of choice in the vast majority of patients. Metformin can be started at a dose of 500 mg daily or twice daily with meals. Commonest side-effects are gastrointestinal symptoms. Sustained release preparations of metformin may have less gastrointestinal side-effects. Glycaemic response should be monitored no sooner than 2 weeks after initiation of treatment. Doses of metformin above 2 g are unlikely to improve glycaemic control any further and will only increase the severity of side-effects.

If the patient presents with hyperglycaemic symptoms or has catabolic features such as loss of weight or has HbA1c more than 10% or random glucose more than 300 mg/dL, insulin should be combined with metformin initially, irrespective of the type of diabetes. Single bed time dose of intermediate acting (isophane insulin) or long-acting insulin (glargine or detemir) at a dose of 0.2 – 0.3 U/kg/day is a suitable initial strategy.

In patients who present with HbA1c more than 9% or random blood sugar more than 300 mg/dL, but without ketosis or catabolic symptoms, and if type 1 diabetes is not considered a possibility, a sulphonyl urea can be combined with metformin, especially in patients who are not willing to start insulin therapy. Newer sulphonyl urea drugs such as gliclazide, gliclazide modified release, glimepiride and glipizide are preferred over older sulphonyl urea drugs such as tolbutamide and glibenclamide, due to lower risk of hypoglycaemia and better cardiovascular safety of newer drugs.

Blood sugar control can be monitored with self-monitoring of blood glucose (SMBG) or HbA1c. The target pre-prandial capillary plasma glucose value is 80 – 130 mg/dL. Peak post prandial plasma glucose should be less than 180 mg/dL. Target HbA1c is < 7% in most patients. However, glycaemic targets should be individualized based on patient characteristics and balancing the potential long-term benefits of glycaemic control and risks of hypoglycaemia and other side-effects of drugs.

If glycaemic targets are not achieved with initial therapy, addition of second-line agents should be considered. For patients with established atherosclerotic cardiovascular disease, heart failure or diabetic kidney disease, SGLT 2 inhibitors should be the add-on therapy. In the absence of above indications, second-line therapy should be selected considering the glycaemic efficacy, cost, availability, need to prevent hypoglycaemia and patient preference. DPP-4 inhibitors such as sitagliptin and linagliptin are reasonable second-line choices, especially when minimizing hypoglycaemia is important. Linagliptin can be safely prescribed even in advanced renal failure.

Pioglitazone is a less costly option with low risk of hypoglycaemia. However, it can cause fluid retention and weight gain and therefore should not be prescribed to those with established heart failure.

In patients who do not achieve glycaemic targets with life style modifications, medical nutrition therapy and 2 or more oral hypoglycaemic agents, initiation of insulin should be strongly considered. Basal insulin can be added to the existing oral hypoglycaemic regime as described before.

Screening for diabetes complications

All patients with type 2 diabetes should be screened for microvascular and macrovascular complications at the point of diagnosis and periodically thereafter. Retinopathy screening with dilated fundoscopic examination or retinal photography should be done annually. Nephropathy should be screened with urine albumin to creatinine ratio and serum creatinine. Foot examination should be done at least annually to identify a high-risk foot. Mono filament test and vibration perception threshold or vibration testing with a tuning fork should be done to identify loss of protective sensation. Pulse examination can be followed up by ankle brachial pressure index in the evaluation of peripheral vascular disease.

Slowing the progression of diabetic kidney disease

1. Using anti-diabetic medications with reno-protective effects

   Multiple studies (EMPA REG OUTCOME trial for empagliflozin, CREDENCE trial for canagliflozin and DAPA-CKD trial for dapagliflozin) have shown that SGLT 2 inhibitors can slow the progression of chronic kidney disease (CKD) among patients with diabetes mellitus. These drugs reduce renal tubular glucose reabsorption leading to weight loss, reduction of systemic blood pressure, reduction of intraglomerular pressure, reduction of albuminuria and slowing the deterioration of glomerular filtration rate (GFR). These effects are independent of their effect on glycaemic control. Therefore, all patients with CKD 3 or higher should be prescribed a SGLT 2 inhibitor irrespective of their glycaemic control (7).

   Studies have shown that metformin can reduce all-cause mortality and progression to end stage renal disease (ESRD) among patients with type 2 diabetes and CKD (8). Metformin can down-regulate transforming growth factor β 1 by activating AMPK, leading to attenuation of tubulointerstitial fibrosis and epithelial to mesenchymal transition. Therefore, metformin should be continued in all patients with diabetic kidney disease who have an eGFR more than 30 ml/min/1.73m^2. However, metformin should not be initiated in those with an eGFR less than 45ml/min/1.73m^2.

2. Controlling blood pressure

   All patients with diabetes and hypertension and urine albumin to creatinine ratio more than 30 mg/g, in the absence of an alternative explanation for proteinuria other than diabetic kidney disease, should be prescribed an angiotensin converting enzyme inhibitor (ACEi) or angiotensin receptor blocker (ARB). Target blood pressure is less than 130/80 mmHg.

Cardiovascular risk management in diabetes

1. SGLT-2 inhibitor should be prescribed to all patients with diabetes and established ASCVD or heart failure as they have been shown to reduce cardiovascular mortality and hospitalization for heart failure. GLP-1 receptor agonists also have shown similar benefits. However, cost is a limiting factor in prescribing GLP-1 RA to Sri Lankan patients.
2. Blood pressure should be controlled with a target of < 140/90 mmHg in patients with diabetes and a target of < 130/80 mmHg for those who have diabetes and albuminuria. ACEi/ARB, calcium channel blockers (CCB) and diuretics are the first line anti-hypertensives. If the initial blood pressure is less than 160/100 mmHg one drug can be started while two agents should be started in combination if blood pressure is more than 160/100 mmHg. ACEi/ARB should be included in the first-line therapeutic regime if the patient has coronary artery disease or albuminuria. All patients with hypertension should be advised on a low-salt diet, exercise and other life style modifications.
3. Moderate intensity statin therapy should be given to all patients with diabetes and age more than 40 years, irrespective of other risk factors. If these patients have ASCVD or ASCVD risk factors, high intensity statins should be prescribed. In patients with established ASCVD who can't achieve their LDL goal with maximally tolerated dose of statins ezetimibe should be added. Statins are not indicated in patients with diabetes whose age is less than 40 unless they have other ASCVD risk factors.

	High intensity statin therapy (lowers LDL by >= 50%)	Moderate intensity statin therapy (lowers LDL by 30 – 50%)
Atorvastatin	40 – 80 mg daily	10 – 20 mg daily
Rosuvastatin	20 – 40 mg daily	5 – 10 mg daily
Simvastatin		20 – 40 mg daily

Table 2: Intensity of statin therapy

4. Aspirin therapy (75 - 162 mg/day) should be considered in primary prevention only in those patients with high cardiovascular risk and low risk of bleeding. Aspirin should be started for primary prevention only after a comprehensive discussion with the patient about potential benefits and risks of therapy.

Summary

Multiple mechanisms contribute to the pathogenesis of diabetes. Life style modifications, exercise and medical nutrition therapy are integral components of diabetes management. Metformin should be the first line drug in most patients. Glycaemic targets should be individualized. SGLT2 inhibitors can slow the progression of CKD and reduce cardiovascular mortality and hospitalization for heart failure, irrespective of glucose reduction. Blood pressure control and statin therapy help to mitigate cardiovascular risk in diabetes. The place of Aspirin therapy in primary prevention is uncertain. A multi-disciplinary approach to diabetes management will reduce deaths and prevent complications due to diabetes.

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Internet addiction: Teens, Screens, & Screams

Miyuru Chandradasa

MBBS (Colombo), ChildPsych AdvCert (Australia), MRCPsych (United Kingdom), MD Psychiatry (Colombo)
Consultant Child & Adolescent Psychiatrist, Colombo North Teaching Hospital, Ragama
Senior Lecturer, Faculty of Medicine, University of Kelaniya
Secretary, Sri Lanka College of Child & Adolescent Psychiatrists

Teens: The adolescence

Adolescence is a transition between puberty and adulthood, from 10 to 19 years. During this period, emotional and social development greatly influences the personality, character, and achievements in later life, and is divided into three substages: early, middle, and late (1). Finding one's own identity and developing a progressive view of life are salient gains in the middle adolescence. Adolescents need to learn to behave within acceptable moral standards, abide by parental authority, and deal with peer expectations in their late adolescence. However, they are often in conflict with authority and societal norms, requiring the patience and diligence of their parents and teachers.

During adolescence, emotional crises are accompanied by mood changes, despair, and anger. They attempt to fight these episodes through social withdrawal, defiance, physical/verbal aggression, and addictive behaviour. Teenagers are exceptionally vulnerable and receptive during this developmental transition and are quickly drawn to the Internet as a form of emotional release. Over weeks to months, this behaviour could lead to an addiction, mainly if they are confined to home without school due to the COVID-19 pandemic, teachers' trade union action, and fuel shortages. This situation can propel conflicts between adolescents and parents as Sri Lankan teenagers are destined to face two highly competitive examinations in an exam-driven education system. Parents will expect their teenagers to be motivated, self-driven, and achieve high academic results, depending on parents' experience of childhood upbringing and cultural norms.

Screens: Use of Internet

Adolescents use technological methods of communication frequently as they offer a platform to interact with others, give anonymity, belongingness to a virtual community, and a feeling of social acceptability (2). The Internet connects billions of people worldwide and enables users to exchange information instantly and longitudinally. The Internet also poses potential dangers for children and adolescents when used without adequate parental supervision. Adolescents with free access to the Internet are vulnerable to exposure to inappropriate content for their age, as well as cognitive and emotional development stages. For example, teenagers who used pornography more frequently were from troubled family circumstances, had permissive sexual attitudes and possessed extreme gender-stereotypical sexual beliefs (3).

Excessive internet use may commence as a scientific interest and later develop into a source of amusement and generator of new attractions. However, unsupervised excess Internet usage leads to social isolation, a sedentary lifestyle associated with poor physical status and possible obesity (4). Internet addiction is associated with low self-esteem, limited self-worth, a desire to conform, boredom, and the unlimited availability of online amusement (5).

Psychiatrists have considered whether Internet addiction could be included in the diagnostic criteria for diseases in the Diagnostic and Statistical Manual of Mental Disorders (DSM). Accordingly, in the 5th edition of DSM, Internet addiction is mentioned in the form of Internet gaming disorder. However, there is no consensus on whether Internet addiction and addiction to Internet games should be viewed together.

There are understandable advantages of Internet use for school and university students, such as access to e-learning, online lessons, and seminars by experts. However, visiting online chat rooms, gaming websites, and social media can easily lead to addiction and negatively impact academic achievements and psychological wellbeing (6). In a recent cross-sectional study in Colombo among 395 GCE Advanced Level students, more than 80% were gamers using mobile and multiplayer battle Royale games. The prevalence of Internet gaming disorder was 5%, and it was associated with low involvement in student societies, poor relationships with parents, and being male (7). With increasing screen use, adolescents abandon social activities and replace them with surfing the Internet, leading to delayed sleep initiation. It is noticed that teenagers consider life boring without the Internet and demonstrate loneliness and emptiness (8). Features of Internet addiction are shown in Panel Box 1.

Panel box 1: Features of Internet addiction

- Preoccupied with the Internet when not using
- Use more and more frequently
- Challenging to reduce internet use
- Feel irritable when trying to cut back on the use
- Use to gain relief from the negative feelings
- Risk academic achievements while using
- Delayed sleep and poor quality
- Fatigue and apathy when not using
- Lie to family members about the use

Screams: Behavioural dysregulation

At times, the removal of screens and screentime control imparted by parents are met with displeasure and protest by the adolescent. Parents' attempts to reduce screen engagement and divert time to academic work may lead to opposition and defiance by the teenager. There are recognised features in adolescents that make them more prone to developing Internet addiction. Adolescents with internet addiction exhibit more impulsivity than others, which is shown by risky behaviour, rash decisions, restlessness, fidgeting, anger outbursts, excessive talking, oversharing, difficulty in waiting, intrusiveness, and frequent eating (9). Research has shown that people with high coping skills and better self-esteem have less probability of Internet addiction (10). Further, the parenting style affects the occurrence of internet addiction among children and adolescents. The neglecting and permissive parenting styles have a recognisable relationship with addictive Internet use in adolescents (11). Permissive parents are usually very nurturing and loving towards their children and ask their children's opinions on major decisions. They emphasise on their children's freedom rather than their responsibilities. However, permissive parents have few rules, standards, inconsistent limitations and may use bribery such as toys, gifts, and food to make a child behave in a certain way. They have the approach of a friend rather than a parent.

Prevention of Internet addiction in the Sri Lankan setting

Recognising vulnerabilities to developing Internet addiction in childhood and acting early is the rational approach. The parental action for each vulnerability is mentioned in Table 1.

Table 1: Preventive measures for Internet addiction in adolescents

Vulnerability	Behavioural features	Parental action
Impulsive behaviour	Risky behaviour Rash decisions Restlessness Fidgeting Anger outbursts Excessive talking Oversharing Difficulty in waiting Intrusiveness Frequent eating	Teach to recognise emotions Simple short instructions Provide reminders Teach problem-solving Train relaxation skills Consistent household rules Structured daily routine Reward system Be role models with kindness Avoid punishments
Poor coping and low self-esteem	Avoid new experiences Underestimate themselves Blame others for mistakes Be easily influenced by others Easily frustrated Easily hurt by criticism Wish to change their appearance Fear of failure	Validate their emotions Accept them as they are Praise achievements Allow learning from mistakes Provide choices for decisions Teach relaxation techniques Show how to express frustrations Model positive self-talk

Permissive parenting	Nurturing and loving Children make major decisions Emphasise freedom Ignore their responsibility Few rules and standards Inconsistent limitations Use bribery to behave Approach as a friend	Fair and consistent discipline Allow children to express opinions Encourage to discuss options Expressing warmth and nurturing Fostering independence Listen to children Clear behavioural limits Realistic academic expectations

Management of Internet addiction

Management of Internet addiction requires careful expert consideration of complex biopsychosocial factors. If an adolescent is suspected of Internet addiction, he/she should be referred to a consultant child and adolescent psychiatrist for assessment and treatment. The child and adolescent psychiatrist will screen for impulsive behaviour, attention deficit, low self-esteem, depressive symptoms, coping styles, and parental interactions. Treatment includes cognitive behavioural therapy, family psychotherapy, and psychotropic medications for comorbid psychopathology.

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I prefer to be called a writer: Perhaps more than a doctor or a director...!

Dr. Anil Samaranayake

MBBS(Colombo), MA(Sri Jayawardenapura), MSc(Comm.Med), MD (Comm Med.)
Consultant Community Physician
Senior Medical Administrator - Director - Nutrition Division
Director - Health Information and Quality Improvement Project
Ministry of Health

I graduated from the Faculty of Medicine of the University of Colombo, in 1995. Five years into my medical career, in the year 2000, I completed my M.Sc in Community Medicine. Then while following the MD course in Community Medicine, I concurrently followed the Master of Arts programme in Mass Communication of the University of Sri Jayawardenepura.

From very early on in childhood, I had developed the habit of reading. By the age of 10, I had managed to read virtually all the books from all great Sinhala authors such as W. A. Silva and Martin Wickremasinghe.

As I grew up, I started to read on many different topics. These included the great biographies of famous personalities. No matter how busy my schedule was I managed to have my time for books.

The consistent love for reading, as well as watching movies throughout my adolescent life, induced me to enter into the field of mass communication. As the initial way of entry, I started following the MA in Mass Communication. It really helped me to develop my communication skills and knowledge. Subsequently, with the right media connections, I was able to participate in many radio and television programmes. I was also able to publish hundreds of articles in magazines and newspapers.

My published M.A. thesis; "*Way to the Encyclopaedia of Sinhala Cinema*" caught the eye of the great actor Gamini Fonseka. In fact, he was quite impressed by the single page that I had written about him and the thespian actor requested me to write his biography in the year 2004.

As a medical doctor, I consider it to be a singular honour to be

the only 'Authorised Biographer' of the late Emperor of Sri Lankan Cinema, Mr. Gamini Fonseka.

I have been bestowed many such honours in the field of literature as well. I was nominated for the Literary Awards at the 2017 State Literary Festival for the best science fiction and also served as a member of the Jury at the 2018 State Literary Festival.

Obtaining of the Masters degree in Communication, made my professional life to be totally different. I became a member of a social network that many medical professionals do not get a chance to enter. It also enhanced all my personal communications skills as well. Thereafter, dealing with many professionals in the field of medicine and many other fields became so streamlined that I was able to achieve the specific objective in each encounter with minimal effort.

Thereafter, in the field of academia, I was able to complete my M.D. Community Medicine degree by 2009, and secured the opportunity to get training experience in Uppsala University, Sweden and Melbourne University, Australia.

In the year 2010 I joined the field of Medical Administration and the communication skills that I had developed were really helpful throughout. Based on my literary interest in cinema I was appointed to the Board of Directors in the National Film Corporation in 2015; perhaps a rare honour for a member in the field of medicine.

As of 2021 I have published 14 books including memorabilia of medical student days at the Faculty of Medicine, Colombo titled "Fallen flowers on Kynsey Road". In 2017 I compiled the biography of Professor Captain Nalaka Jayakodi and the book launch was attended by the Executive President of Sri Lanka. I consider it to be an outstanding achievement for a 'non-professional author' like me.

As I look back, getting into the field of writing has made my life to be a little bit 'distinguished' to some extent. I have noticed that most of our doctors limit their social life to their own professional colleges only. Some of them plan their entire future on how and when to become the president of that particular college. With that intention in mind, they may restrict their entire social life to meeting the same group of colleagues, year in and year out, at the annual sessions and annual dinners.

But my habit of getting into hitherto unexplored territories, rather than limiting myself to our own professional colleges, has made my social life diversified and more entertaining. I never say no to an invitation to meet people from different sectors of life such as writers, artists or media personnel.

These encounters generate opportunities that lead to one being invited to contribute professionally. Such novel social connections might take one along a pathway that one one would have imagined to be a reality. If I were to quote an example; in the year 2002, I was invited to conduct a lecture on drug abuse management by the National Dangerous Drug Control Board (NDDCB). Subsequently that effort on my part, led to my developing good personal and professional connections with that institute. With that professional connection, which thrived over the subsequent years, by 2017 I became an Internationally Certified Addiction Counsellor with approval to carry out my professional practice in many countries, including the USA.

My advice to our colleagues and to our younger generation is to think out of the box and use your social skills well, to establish a variety of social connections. Everybody can write. Do start writing on some interesting fields like environment or archaeology. Share them with relevant media. You might get a chance to go the same way that I was able to go. Unless you write, how can your work get published?

As an author, I have become a popular icon among a new generation in a social media fan base. Start using social media. One could start a dedicated YouTube channel. What prevents you? It is only you!

Believe me, I have explored many unknown territories in life and it has really helped me to live by my own motto in life fully. If I can do it, so could you.

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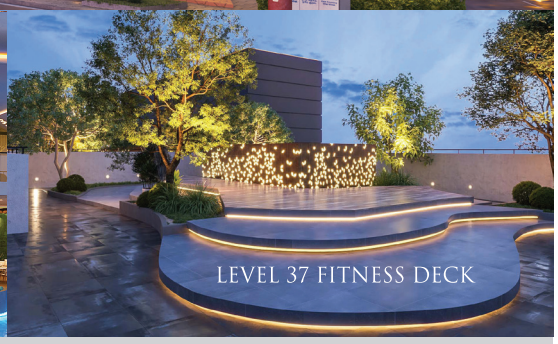

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