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DR. RAFAQ ALAM KHAN

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FROM EDITOR IN CHIEF

The publication of the newsletter "PHARMAVISION" rightly fills the gap in communication in the times of COVID-19 providing updated information on the subject matter. It offers a wide range of authenticated information in the field of pharmacy to the learned audience.

I hope that the newsletter will engage the students of Faculty of Pharmacy in healthy activity and keep them updated with the current research trends continuously evolving in the field of Pharmacy around the world. It surely provides a constructive platform for students to receive relevant information, ultimately leading them to engage in critical thinking and hopefully birthing ideas of their own. Hence, the goal of the newsletter is not merely restricted to dissemination of information, rather it is to enhance students' reasoning and divergent thinking skills. It is only with the enthusiastic participation of the students and teachers alike that the attainment of such a goal would be possible.

I congratulate the editorial board of the newsletter involved in this activity and wish them all the best in future.



FROM THE DESK OF EDITOR

Nearly a year has lapsed since the beginning of the COVID pandemic in Pakistan. Several vaccines have now become available as means to protect against the virus and are strongly being recommended by the health care experts' world over. However, it has been observed that the general distrust of government-led and foreign funded public health initiatives is driving vaccine hesitancy within the masses in Pakistan. Also, the swift introduction of the vaccine with the safety profiling being conducted as a parallel process is raising concerns regarding the safety of the vaccine in the long run. In this context, various rumors are circulating on the internet and on social media platforms as well. However, as part of the routine monitoring, as with all vaccines, the COVID vaccines are under observation of the Task Force for Global Health's Brighton Collaboration, which constitutes of over 750 vaccination experts. Also, the Coalition for Epidemic Preparedness Innovations (CEPI) – which, together with Gavi and the World Health Organization (WHO) is driving forward COVID-19 vaccine development. Hence, ensuring the safety profile of these vaccinations is of utmost importance for the regulatory as well the health care organizations globally. It is however generally believed by the health care experts that any possible risks that might actually exist with getting vaccinated are considerably lower than those associated with COVID-19 infection, and vastly outweighed by the benefits of protecting people and preventing the virus from spreading.

The hesitancy and reluctance of the people to get vaccinated could seriously undermine efforts and delay eradication of the COVID-19 pandemic. A survey conducted recently showed that the main reason for hesitancy among the Pakistani population was that of safety concern and this concern had no correlation with the socioec-

onomic backgrounds. Since to date no evidence or data is demonstrating any serious adverse effects in response to the vaccination, it should be our prime duty at this point to encourage and educate those around us. It can be hoped that with the growing fraction of the vaccinated population, without any reported or experienced incidents of severe side effects, hesitancy may diminish.

Dr. Sidra Tanwir

Editor

Assistant Professor

Faculty of Pharmacy



HERBALISM AND FALSIFICATION

DR. AHMED SHAHID MIRZA DEPARTMENT OF PHARMACOGNOSY, FACULTY OF PHARMACY, ZIAUDDIN UNIVERSITY

We tend to forget the importance of plants and often take them for granted. We may not think much of the plants and trees around us but they are in fact vital for life and our long-term survival. Plants are an essential resource; we rely on them for food, water, the air we breathe, habitat, our climate and most importantly as part of herbal medicines. 'Herbalism' is the most popular form of traditional medicine. Herbal drugs, due to their effectiveness, lower adverse effect profiles, low cost and ease of availability, have been the primary source of treatment in healthcare. In the context of the growing demand of herbal drugs, their misuse and herb-drug interactions (HDI) are being reported, this is mainly attributed to their complex mixture which contains multiple active phyto-components and also due to drug-adulteration, which is a common problem in Pakistan. Most of the herbal products sold in community pharmacy and health food shops are not registered hence lack readily accessible key safety information (leaflets). Many herbal products are unsafe for use in people with certain pre-existing illnesses; for example, Asian ginseng is contra-indicated in diabetes, have interactions with other products; for example the use of St John's Wort affects the efficacy of warfarin, and may cause adverse effects; for example allergic reactions are associated with ginkgo. Use of unlicensed herbal remedies is widespread due to the lack of pharmacovigilance within our healthcare system. These remedies don't meet specific standards of safety and quality. Herbal drug utilization in urban and rural areas is very popular in Pakistan. These drugs are not only utilized in modern medicines, but in the form of crude medicinal plants. Poly herbal

formulations and herbal extracts are also being utilized in Unani, Ayurvedic and Homeopathic system of medicine.

This article aims to create awareness not only to the lay person but also to the herbal practitioners and physicians regarding the presence of steroids in unlicensed poly herbal formulations and to encourage the discontinuation of the use of these unregistered herbal formulations. It is necessary to ensure that the public is getting full disclosure of key safety information when they purchase herbal products over the counter. Consumers need to be advised what are registered products and where and how to purchase these products. In addition to this, there should be continuous monitoring of the written information supplied with these products to encourage improvement regarding safety issues.

There are four possibilities of counterfeit in herbal medicines. Among these are the herbal medicines which are adulterated with undeclared synthetic pharmaceuticals, herbal medicines containing undeclared heavy metals, herbal medicines without active ingredient and herbal medicines with wrong active ingredient. General public, local healers and the physicians should be educated and made aware regarding the side effects of steroids when consumed unmonitored by humans. Mostly, dexamethasone and prednisolone are adulterated in tablets and powders prescribed by hakeems and quacks. They contaminate drugs with the aim of quick relief of symptoms, however they do not label their formulations or indicate the steroidal content.

In Pakistan a major proportion of the population is un-educated and there is a lack of proper medical care facilities. These people take the quackery formulations from different sources. Because of the lack of comprehensive regulations regarding quackery practices and standards for quackery formulations, most people who consume the herbal products and supplements do not discuss these with a licensed pharmacist or doctor, thereby decreasing the likelihood of Herbal Drug Interactions being identified or reported. It is imperative that these drugs be screened for steroids with an aim to protect the patients from adverse effects of steroidal contaminants. However, the proper use of plants with adequate knowledge might prevent possible risks for future incidents.

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NEED GOOD QUALITY SLEEP? FOLLOW SLEEP HYGIENE

DR. FAIZA AKHTAR DEPARTMENT OF PHARMACEUTICAL CHEMISTRY, FACULTY OF PHARMACY, ZIAUDDIN UNIVERSITY

Have you ever found yourself gazing at the ceiling when you actually wanted a good sleep after a long tiring day? Or wake up in middle of the night thinking that it's morning?

If you are facing hard time falling asleep, inconsistent sleeping patterns or are in dire need of good sleep you need to consider "SLEEP HYGIENE"

Sleep hygiene is a phrase that is often used to describe good and healthy sleeping habits. Getting a healthy sleep is one of the most important aspects of life for both physical and mental health as well as to improve the overall quality of life. From children to elderly, healthy sleep pattern benefits lives and to achieve this goal sleep hygiene is the key tool.

Many researches have proposed strategies and guidelines to achieve good sleeping habits, which also provide long-term solutions for those facing sleep difficulties. There are certain medications to treat insomnia but these medications cannot be used on long term basis as few of them may lead to dependency and do not lend to independent sleep habits. Sleep hygiene encircles both environment and habits beneficial for a good and better quality of sleep. Sleep hygiene has a vital role in the treatment of insomnia and disturbed sleeping patterns either alone, with medications or cognitive therapies.

Following are some tips of sleep hygiene which are most advantageous when adopted in a virtuous manner:

1. Fixed Sleeping Schedule:

Be consistent with your bed time. Try to go to

bed and wake up at same time everyday regardless of weekends or holidays. This is one of the best ways to train your body to sleep well and to work in a boosted way. Fluctuating sleeping schedule will not allow the body to adopt to the rhythmic sleep cycle.

2. Sleep When Sleepy:

Always go to sleep when your body is actually tired and your brain gives signals to get a good sleep. Never go to bed in fully awakened condition and spend longer period of time awake on the bed. If you are unable to sleep for more than 20 mins, get up and read a book or have a walk. Try sleeping again after a little while.

3. Adjust Sleep Time Gradually:

If one needs to change the sleep time never do this all of sudden. This will lead to disturbance in your body clock. Try to make changes slowly and gradually, take small steps by adjusting from 1 to 2 hours, so your body can adjust according to the new schedule.

4. Bedding Rule:

Do not use your bed for sitting purposes, for watching TV, using laptop or other gadgets or even for reading books. Use your bed only for sleeping. By doing this your body will develop a good connection and an association of bed with sleep.

5. Avoid Naps:

In order to get fine sleep, avoid napping during the daytime. This is considered as one of the best practices in sleep hygiene. Napping especially in afternoon, may affect sleep pattern as it will make you more prone

to wake up during night. Make sure your body is fully tired at night when you hit the bed to get sound sleep.

6. Exercise For Better Sleep:

It is suggested that an aerobic or cardiac exercise of 30 mins can really improve the sleep quality along with your overall health. However it is important to remember to avoid exercising near bed time as it will boost your body temperature as well as your body energy. The best time to exercise is early morning.

7. Avoid Caffeine, Nicotine And Alcohol:

The best practice of sleep hygiene is avoiding edibles that contain caffeine (chocolate, coffee, tea) 4-6 hours prior to sleeping time. Also avoid smoking and alcohol consumption before bed time. There is a general perception that alcohol induces sleep but actually consuming alcohol at bed time reduces sleep quality.

8. Late Night Meals:

Taking heavy, spicy or fatty meals just before bedtime can cause sleep interruption because the food takes longer to digest. It is suggested that dinner should be taken at least 2-3 hours prior to sleep time. Taking a glass of warm milk before sleeping helps to induce good sleep. Milk contains tryptophan that works as natural sleep inducer.

9. No Electronic Devices On Bed:

Melatonin is a chemical that controls sleep cycle of the body. According to research, many electronic devices for example cell phones emanate blue light that decreases the melatonin levels in the body and makes your brain more alert and active. Therefore, it

is suggested not to use any type of electronic devices at least 30-60 mins prior to going to bed.

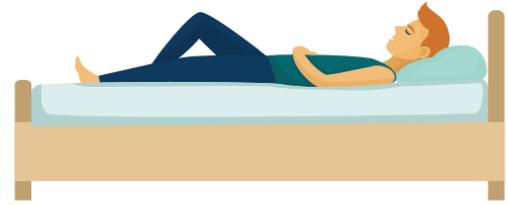
10. FOLLOW SLEEP RITUALS:

Some people find it more relaxing to use breathing exercises. You could also take a hot bath 1-2 hours before reaching out to bed. This helps to induce sleep as it reduces body temperature and research proved that dropping body temperature helps in sleep induction. Dimming down bedroom lights

and using calming scents, are also considered as a part of sleep hygiene.

Adopting the above mentioned sleep hygiene tips will ensure healthy sleep habits. A good quality sleep is not only essential for efficient brain activity but also has a huge impact on your physical and mental behavior throughout the day.

"Tired minds don't plan well. Sleep first, Plan later"-Walter Reisch



Reference:

CDC guidelines for Sleep and sleep disorders https://www.cdc.gov/sleep/about_sleep/sleep_hygiene.html

FACULTY UPDATES

On the 3rd of March 2021, the Faculty of Pharmacy was officially shifted to the new building on the Link Road Campus of Ziauddin University, in Education City. The stone laying ceremony for the building took place on the 16th April 2019. In less than two years a state of the art building has been constructed. The new campus consists of spacious classrooms with a capacity for over 150 students and well established laboratories consisting of latest



instruments and apparatuses. The building comprises of its personal library where all relevant books required by the students shall be available for their ease. Other than this the animal house and research center is also under the process of construction in order to facilitate the research activities of the students and faculty alike. Keeping in mind the importance of extracurricular activities along with the academic pursuits, the



campus will offer the facility of a gym and an indoor swimming pool to its students.

The new building and campus is a huge leap in the journey of progress and evolvement of Faculty of Pharmacy. It is hoped that the provision of such facilities and environment to the faculty and students will have a positive impact on their performance, outcomes and progress.



NEED FOR STANDARDIZATION OF HERBAL MEDICINES

AYESHA JABEEN DEPARTMENT OF PHARMACOLOGY, FACULTY OF PHARMACY, ZIAUDDIN UNIVERSITY

The term "herbal drugs" means plants or parts of plant that have been transformed into phytopharmaceuticals through simple processes like harvesting, extraction, drying, and storage. Awareness among people is increasing towards the use of herbal drugs because of the potential lethal side effects of modern and synthetic drugs. Herbal drugs have always established their effectiveness in the treatment of severe diseases since the time of the ancient civilizations. Although, most of these applications are unorthodox, however nearly 80% of the world population use herbal medicines.¹ The increased use of herbal product may cause adulteration of the products leading to customers and manufacturers dissatisfaction and sometimes it may have fatal consequences thus making the global herbal market unsafe. World Health Organization (WHO) also supports, endorses and promotes the presence of herbal drugs in national health care programs because these drugs are easily accessible within affordable prices to common man. They are also timely and safe as compared to modern synthetic drugs. Herbal drug is a key component in traditional medication and a common constituent in naturopathic, homeopathic, ayurvedic, and other medicine systems. Since the herbal formulations are primarily of plant origin, they are vulnerable to contamination from different sources like chemicals that leads to variations in their chemical composition and also may be a cause of deterioration. Therefore to ensure the safety and efficacy of herbal medicines, standardization and development of quality control protocols is very important. Unprecedented growth in admiration of complementary medications increase the concerns about their safety and quality. So, there is need to develop procedures for their definite and precise analysis. Validity, presence of all medicinal nutrients and strict method of material handling are important features to maintain the quality and efficacy of herbal preparations. For the identification of medicinal plants and their constituents, WHO guidelines

provide the fingerprinting methods to meet the global standards of quality control of the herbal formulations. Standardization comprises of various parameters like gross morphology, microscopy, physical parameters, chemical fingerprinting, chromatographic fingerprinting, spectroscopic fingerprinting, DNA marker fingerprinting etc. The standardization of herbal drugs may increase their acceptance worldwide and improve the quality, safety and therapeutic efficacy of these drugs. The traditional approach towards standardization is insufficient for current herbal market and hence there is need for more advanced techniques for standardization.²

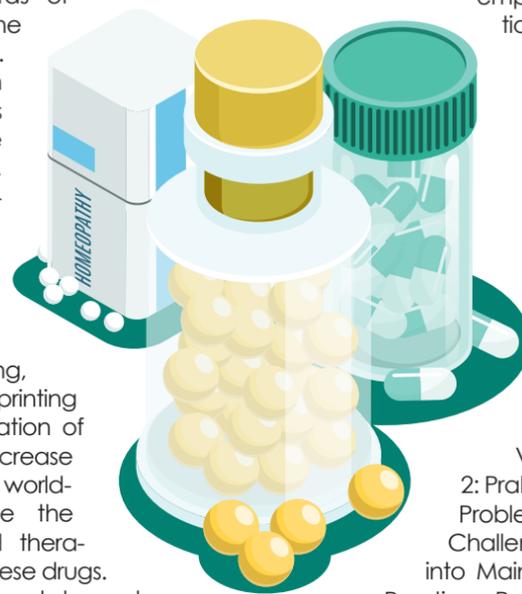
According to WHO guidelines, the new analytical methods/technologies include:

- DNA-based technologies (e.g. DNA-fingerprinting and DNA-sequencing)
- Nuclear Magnetic Resonance Spectroscopy (NMR)
- Ultra-Violet (UV), Mid-Infra-Red (MIR) and Near Infra-Red (NIR) spectroscopy combined with computational analysis
- Hyphenated techniques (HPLC-MS, LC-NMR, etc.)
- Chemo metric approaches (including Multi-Variate Analysis (MVA) and Principal Component Analysis (PCA))
- Biosensors
- Phytosome (Phytosomes as emerging nanotechnology for herbal drug delivery^{3,4})

If these analytical methods/technologies are employed before the administration or consumption of the herbal medicines, it would be safe to use them and will also increase the compliance of the patients.

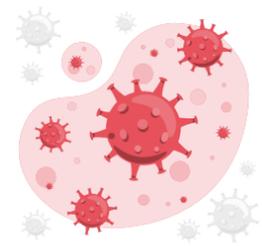
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COVID-19 AND MUCORMYCOSIS

DR. MARIA ASHFAQ DEPARTMENT OF PHARMACEUTICS, FACULTY OF PHARMACY, ZIAUDDIN UNIVERSITY



The whole world is currently challenged with the wide spread of Corona Virus Disease 2019 (COVID-19), which is caused by Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2). Initially COVID-19 pandemic dispersed slowly but later it became much more aggressive and carried an extensive range of opportunistic bacterial as well as fungal infections. In the past, both *Aspergillus* and *Candida* have been reported as the main fungal pathogens associated with the secondary clinical manifestations in patients with COVID-19. Currently, world over and especially in India, rhino orbital mucormycosis has been frequently reported in people infected with COVID-19.

Mucormycosis, also known as black fungus, is a rare but fatal infection, especially in patients with weak immunity. It causes blackening or discoloration over the nose, blurred or double vision, chest pain, breathing difficulties and produces blood during coughing. According to the recent estimate of data collected in 2019-2020, global prevalence of mucormycosis varied from 0.005 to 1.7 per million in general population whereas it is 80 times higher i.e. 0.14 per 1000, in India.

Studies indicate that the prime reason behind this outbreak of Mucorales spores to germinate in Covid-19 patients is a growth friendly environment, that could be due to trauma, hypoxia, Diabetes Mellitus (DM), steroid-induced hyperglycemia, new-onset hyperglycemia, diabetic ketoacidosis, metabolic acidosis, high iron levels (increased ferritins) or decreased phagocytic activity of white blood cells, these together with many other risk factors including prolonged

hospitalization with or without mechanical ventilators contribute to the high rate of infection observed.

DM was observed as one of the leading risk factor for mucormycosis worldwide, with the overall mortality rate of 46%, and *Rhizopus* was the most commonly isolated species that is about 48%. On the other hand prolong use of corticosteroids has also been linked with the growth of several opportunistic fungal infections including aspergillosis and mucormycosis. According to the European Confederation of Medical Mycology, few cases of COVID-19 with mucormycosis have been reported in short term courses (5–14 days) of steroid therapy, mainly in the patients with DM.

All these results need to be reviewed again, in context of COVID-19 pandemic where corticosteroids are frequently being used. This sharp increase in cases of mucormycosis in patients with COVID-19 is mainly seen in India and also less ominously from other parts of the world. Several cases are also available as grey literature. All these findings bear an immense public health importance, as we can see the fatality rate with mucormycosis is relatively high, particularly due to intracranial involvement. In-addition, spreading of mucormycosis is still an unusual phenomenon and according to research even a delay of 12 hours in the diagnosis could be fatal for the patient, due to this reason 50% cases with mucormycosis have been diagnosed on the basis of post-mortem autopsy series.

For treating mucormycosis, Amphotericin B is used as a first line treatment. Monitoring of

kidney function is required, after administering Amphotericin B, as the drug is nephrotoxic in nature. In chronic conditions, Echinocandins and Amphotericin B may be used as a second-line therapy, the addition of polyene backbone increases the success of the therapy. Some of the other second-line accepted antifungals include the triazoles, posaconazole and isavuconazole. Further more controlled sugar levels and reversal of ketoacidosis have led to the best outcomes. In-addition, tapering immunosuppressive therapy may play an additional role in the treatment of mucormycosis.

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INJECTABLE CHIP; AN 'EARLY WARNING' SYSTEM AGAINST FUTURE OUTBREAKS

DR. SAMINA SHEIKH DEPARTMENT OF PHARMACY PRACTICE, FACULTY OF PHARMACY, ZIAUDDIN UNIVERSITY

Electronics are becoming imperceptible and open up new avenues for medical technology to put advanced surveillance and treatment devices in our bodies. According to a recent study published in the *Science Journal Columbia University*, engineers have shown a new revolutionary version of this, creating the smallest single chip system in the world. The tiny new chip can be implanted through a hypodermic needle to measure internal body temperature and perhaps a number of other parameters.

The implant created by the engineers in Colombia is record-breaking small. Its total size is less than 0.1 cubic millimeters, which is as small as a dust mite. The new microchip can only be seen with a microscope, and pushed the envelope in power-sourcing and communications ingenuity design.

These microchips can also be implanted in the human body, and then use to communicate the information and data that is measured wirelessly through the ultrasound. As of now, the device can only measure the

body temperature, but it is expected to eventually be able to monitor the functions of the respiratory tract, glucose levels, and blood



pressure. "We wanted to see how far we could push constraints on how small a chip we can make," said Ken Shepherd, Columbia's study

leader, in a report from the new *Atlas*. "This is a new idea as a chip system, and this is a single chip, without anything else, which is a fully functioning electronic system," he said.

"This will be revolutionary, to develop miniaturized medical devices that can feel different things and use them in clinical applications, and ultimately attain approval for use in humans" Shepherd further added. In the post-corona virus world, it is not difficult to see the direct benefits of injecting of benign devices capable of monitoring body temperature. One day, something like this could be an early warning system for the officials for the probable brewing epidemics. Although the tiny computer chip is still in its early stages, there is much to be expected with the start of medical technology to push into the cyber space of tomorrow.

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