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Editorial

From the Desk of *Hony. Secretary and Chief Editor*

It has been quite a long time that I could not have a contact with my readers, colleagues and friends as chief editor of this esteemed newsletter. Let me apologize for that. As we all are aware about the WHO definition of health i.e "A state of complete physical, mental, social and spiritual well being and not merely the absence of disease and infirmity. Hence in public health, the importance of mental aspects of the health including Depression, Anxiety and Stress (DAS) cannot be ignored**.** If you see the prevalence of DAS among the students as well as among adolescents, it has increased tremendously in recent times. India constitutes about 21% of adolescent population of the world.[1] One out of six children are said to be affected with mental disorder. Community based studies in India reported psychiatric disorders among children in the range of 2.6- 35.6% while global data shows that the prevalence of mental disorders among children and adolescent range from 1% to 51%. In USA and Australia one out of five teenagers suffers from mental health problems. WHO reports that community base studies shows prevalence of mental disorder to the range of 20%.[2].We have recently conducted two studies of prevalence of DAS among students and adolescent (13-18 yrs) of Panjab University and Chandigarh city respectively.

I It was shocking to find out that among school going adolescents of Chandigarh city, prevalence of depression was 65%, anxiety- 81% and stress- 47%. Overall DAS was found to be 36%. Co-morbidity of depression and stress was 48% and stress & anxiety was 50%. The overall prevalence of DAS was found to be higher in classes than Non-board classes. It also increased with better education level of parents, and it was found more in nuclear families. Prevalence of DAS increased as the mother's love decreased and DAS was more in those adolescents who were smokers and drinkers. The prevalence of DAS was more in students belonging to lower socio-economic class and among those adolescents whose mothers were not alive.[3]

II. Over all prevalence of DAS among the students of Panjab University was quite high i.e 59%, 86.5% and 53% respectively while high co-morbility of depression, anxiety and stress stood to the tune of 40% Over all depression was higher (61%) in females than (53%) in males. 27% of females counted for extremely severe anxiety in comparison of 19% of males while 12% of males have fallen in severe and extremely severe stress in comparison to 9% of females. Prevalence of depression was 69% in students from joint families as compare to 57% in students belonging to nuclear families. 44% students expressed overburden due to test schedule and 70% of them were depressed and 94% showed an anxiety. 73% of students who were not satisfied with their academic prevalence were depressed, 93% of them showed anxiety and 63% presented with stress. 75% of students whose parents were not satisfied with their academic performance were depressed in comparison to 54% whose parents were satisfied. DAS was higher among those students who felt for need of parental love.[4] It was therefore, recommended that counselling services should be provided at Panjab University level and support from parents also would be beneficial for promotion as well as maintenance of over all good health of the students of university . It was also

recommended whenever students approach the doctor for some physical ailment, the overall assessment of their health including psychological aspects (for DAS should also be ensured).Hence, it is the right time to start mentoring programme for the students of Punjab University which is already being implemented in the countries of western hemisphere.Since prevalence of DAS was found to be very high among school going adolescents hence, there is imminent need of National mentoring programme for the children as well as adolescents. For relieving stress different relaxation exercises including yoga, laughter therapy and other activities should also be made part of school curriculum. Those schools which are running this programme for quite a long time are not giving adequate attention to mental psychological and emotional dimensions. It was therefore, recommended that the school health programme should be strengthened by including the services of child psychologist. Counselling sessions for students as well as their parents should be organised. Since DAS was more among the girls so need of the hour is that more attention should be paid to girl child under school programme.

If we talk at the national level, though we have a well structured females. DAS was higher in students who appeared for Board (10+2)

national mental health programme but its impact has not reached to the students of colleges and universities. There is an urgent need of orientation of education administrators and faculty members of Punjab University, by close association with students involving various dimensions of mental emotional, psychological and spiritual aspects of health care. It is therefore, emphasised that the well thought, well planned structured educational programme may deliver good in the coming time.

Limitations of Studies:

Certain limitations of these studies were also observed. Data was based on self reporting and due to social stigma attached with mental disorder; the students might have hidden some factors and their feelings. So under reporting cannot be ruled out.

As the data was collected in the class room, certain sensitive questions could not be asked. Time was also limited. Hence, more comprehensive survey and detailed interview can be done in future. In the school based study, the data could not be collected from private schools since permission was not granted hence only Government schools were included.

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Recently re-emerging viral infections in India: A brief overview

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Viral infections are re-emerging and are becoming increasingly prevalent in humans recently. The incidence of infectious viral diseases has increased worldwide over the last few years owing to various factors. These infections might present with newer clinical signs and symptoms or they might occur in newer population or different part of region previously infected. The main issue that can come up with the re-emergence of these infections is their resistance to the available treatment modalities, thereby creating an alarming situation. Also the epidemics and pandemics caused by these infections can escalate the morbidity and mortality rates beyond expectation and also pose a threat to nearby regions. Heavier outbreaks are seen in developing countries especially India because of the existing demographic, environmental and socio economic conditions.[1] The re-emergence of these viral infections also impacts the financial and social growth of the country.

The viral infections that have been occurring in recent times include influenza (Bird flu, Swine flu), ebola viral infection, viral encephalitis, nipah viral infection, Crimean-congo hemorrhagic fever, SARS, Dengue fever, enteroviral infections etc.[2] Increased monitoring and surveillance has helped in identifying many previously unrecognizable viral pathogens worldwide. Some of these viral infections which have serious health and economic implications are discussed below

Influenza:

The pandemics of influenza are the worst feared ones globally.

Infectious agent: it is caused by Influenza virus, which is an orthomyxovirus classified into three genera A, B and C. These viruses undergo rapid mutations which cause major antigenic shifts, which are further responsible for several outbreaks worldwide. Two major types of influenza are common, swine flu and avian flu. Avian flu is caused by influenza type A strain H5N1 and Swine flu is caused by influenza type A strain H1N1.

Incubation period: Bird flu has an incubation period of three to ten days. Swine flu has an incubation period of one to seven days.

Occurence: The first pandemic of swine flu was observed in 2009. Since then, few cases of swine flu keep coming up, every year and cause severe morbidity and mortality. Eleven patients have died this year in telangana after being affected with swine flu. The number keeps increasing. The drug of choice is oseltamivir.[3] Avian influenza is highly pathogenic and first occurred in hong kong in 1997. Infection spread to humans directly from chickens and this pandemic was brought under control by effective culling of more than 1.5 million chicks worldwide. In India, avian flu first came in 2006 in states of Maharashtra, Gujarat and Madhya Pradesh. After this, every year, there was a outbreak of avian flu, in different states.[4]

Mode of transmission: Swine flu spreads through the respiratory secretions, through droplets from coughing and sneezing. In some cases it can cause severe respiratory distress and even death. Avian flu is transmitted directly from ill birds and mass culling of birds is needed to contain the spread of infection.

Management: Oseltamivir (Tamiflu), Zanamivir (Relenza) and Peramivir (Actrapid) may help reduce the severity of symptoms and prevent complications. The symptomatic treatment should be done.

Control measures: Patient having swine flu should be isolated to prevent further spread of the infection.[5] Bird flu can be contained by both massive culling of infected birds as well as isolation of the patient.

Crimean congo hemorrhagic fever (CCHF):

Infectious agent: The RNA virus causing CCHF is a member of the genus Nairovirus of the family Bunyaviridae.

Incubation period: The length of the incubation period depends on the mode of acquisition of the virus. Following infection by a tick bite, the incubation period is usually one to three days, with a maximum of nine days. The incubation period following contact with infected blood or tissues is usually five to six days, with a documented maximum of 13 days.

Reservoir and mode of transmission: Ixodid ticks of genus hyalomma act as vectors and various wild and domestic animals serve as reservoirs. The virus is primarily transmitted to people from ticks and livestock animals. Human-to-human transmission can occur resulting from close contact with the blood, secretions, organs or other bodily fluids of infected persons.

Occurrence: First ever case of this viral infection was reported in 2011. It is endemic in Africa, the Balkans, the Middle East and Asian countries south of the 50th parallel north; the geographical limit of the principal tick vector. The virus causes predominantly haemorrhagic manifestations in humans, with high case fatality rates ranging from 15 to 70%.

Identification: Laboratory diagnosis of CCHF has to be performed in biological safety level-4 (BSL-4) facility. CCHF virus infection can be diagnosed by several different laboratory tests like enzyme-linked immunosorbent assay (ELISA), antigen detection, serum neutralization, reverse transcriptase polymerase chain reaction (RT-PCR) assay and virus isolation by cell culture.

Management and Control measures: Treatment of CCHF is mostly supportive, though Ribavirin has shown benefits in in vitro studies and is also recommended for post-exposure prophylaxis. Animal handlers, abattoir workers and veterinarians are at high risk and preventive strategies include use of effective personal protective measures against tick bites.[6,7]

Nipah viral infection:

Infectious agent: It is caused by a zoonotic paramyxovirus, affecting pigs and humans beings.

Incubation period: After exposure to the virus, sign and symptoms take around 5-14 days to develop.

Occurrence: It first appeared in peninsular Malaysia, resulting in death of 105 patients out of 25 infected, most of those who had come in close contact with infected pigs. They develop a respiratory illness while humans present with encephalitis. \

Reservoir: Pteropus giganteus fruit bats act as reservoirs of infections and these bats live in close association with the humans, thereby leading to the repeated outbreaks of this infection.

Control measures: Mass culling of more than a million pigs contained the outbreak in Malaysia. A similar outbreak which was retrospectively identified to be due to Nipah virus was reported in 2001 from Siliguri, West

Bengal, not far from Bangladesh. In april 2007, 30 cases were reported in nadia district of west Bengal.

Identification: Procedures for the laboratory diagnosis of Nipah virus include serology, histopathology, PCR and virus isolation.

Management: There is no effective treatment for Nipah virus disease, but ribavarin may alleviate the symptoms of nausea, vomiting, and convulsions,[8,9]

Viral encephalitis:

Infectious agent: It is caused by Japanese encephalitis virus belonging to flaviviridae family. Most JE virus infections are mild (fever and headache) or without apparent symptoms, but approximately 1 in 250 infections results in severe disease characterized by rapid onset of high fever, headache, neck stiffness, disorientation, coma, seizures, spastic paralysis and death.

Incubation period: Japanese encephalitis has an incubation period of 5 to 15 days and the vast majority of infections are asymptomatic

Reservoir and mode of transmission: Pigs and wild birds are natural reservoirs of this virus and the virus gets passed on to animals or humans by bite of culex mosquito. One in four cases has a fatal outcome.

Occurrence: Transmission occurs principally in rural agricultural locations where flooding irrigation is practised, e.g. flooded rice fields and is related mainly to the rainy season in south-east Asia. Japanese encephalitis is common during the monsoon season when mosquitoes breed. The monsoon season starts in June. And that is the time of the year when India witnesses several cases of Japanese encephalitis. In the most recent outbreak, west Bengal was most severely affected.

Identification: Confirmatory laboratory testing is often conducted in dedicated sentinel sites, and efforts are undertaken to expand laboratory-based surveillance. Case-based surveillance is established in countries that effectively control JE through vaccination.

Management and control measures: There is a vaccine for this infection but it is very expensive. There is no cure for Japanese encephalitis. However, best way to deal with it is to contain the spread by not letting mosquitoes breed in the first place.[10]

Ebola viral infection:

Infectious agent: It is caused by ebola virus and is characterized by severe hemorrhagic fever in humans as well as other mammals. The patient presents with fever, sore throat, muscle and joint pain,lack of appetite followed by extreme weakness, lethargy, vomiting, diarrhoea. Finally the severe symptoms appear like bleeding from eyes, ears, nose, bloody vomiting and bloody diarrhoea.

Incubation period: The time interval between exposure to the virus and first development of signs and symptoms usually ranges between 2- 21 days.

Occurrence: Ebola virus disease (EVD) first appeared in 1976 in 2 outbreaks, one in Nzara, Sudan, and the other in Yambuku, Democratic Republic of Congo. The latter occurred in a village near the Ebola River, from which the disease takes its name. The current outbreak in west Africa, March 2014, is the largest and most complex Ebola outbreak, resulting in around nine thousand deaths.

Reservoir and mode of transmission: It is thought that fruit bats of the Pteropodidae family are natural Ebola virus hosts. Ebola is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals such as chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest.

Identification: It is difficult to distinguish EVD from other infectious diseases such as malaria, typhoid fever and meningitis. Confirmation that symptoms are caused by Ebola virus infection are made using the tests like antibody-capture ELISA, antigen-capture detection tests, serum neutralization test, RT-PCR assay, electron microscopy, virus isolation by cell culture. Samples from patients are an extreme biohazard risk; laboratory testing on non-inactivated samples should be conducted under maximum biological containment conditions.

Management and control measures: There is no specific treatment for ebola infection except giving symptomatic treatment and isolation of patient along with environmental infection control measures and proper disposal of potentially infected material following biohazard precautions. Ebola virus is easily killed by soap, bleach, sunlight, or drying. Hence regular hand washing is quite helpful to contain the spread of this infectious viral disease.[11]

Measures to decrease the re-emergence:

The infectious viral diseases pose a major health problem worldwide, especially developing nations and need to be combated. This will require sophisticated epidemiologic and molecular biologic technologies along with changes in human behaviour as well a changed national perspective. In India, following measures are being taken and considered:

1. Strengthening of rapid response centres and increasing the efficiency of surveillance centres

2. Keeping in tune with the latest international health regulations, thereby limitng inter country spread, especially travel regulations.
3. Research and development of tools for handling epidemics in case of sudden outbreak and timely diagnosis of the infection by formulating advanced diagnostic tests which can detect the infection in its early stage.

The way ahead:

In India, these emerging and re emerging viral infections pose a real challenge. There is a need for a comprehensive approach which covers all the relevant sectors involved in control and prevention of these outbreaks.Concerted efforts are also needed to develop better surveillance tools, diagnostic tests, vaccines and therapeutics through research. The rapid response mechanisms should be capable of detecting early public health threats and responding fast enought to protect further spread and mortality.

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Spirituality and health

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Spirituality is simplicity, sincerity, purity and humility. A simple life helps the seeker grow. A sincere life helps the seeker fly and dive. A pure life helps the seeker become one with God's Vision and God's transcendental Reality. A humble life helps the seeker embrace the length and breadth of the entire world. "

Sri Chinmoy

Religion and spirituality are often used interchangeably and may sometimes overlap[1]; however, there are some differences that are noted by lay people and in the literature. Spirituality is a broader concept than religion. The type of belief inherent to spirituality is broader than that of religiosity, which often refers to an individual's beliefs and behaviors associated with a specific religious tradition.[2] According to some, that which is spiritual transcends personal, scientific and also physical boundaries, whereas religion is defined by boundaries of religious doctrine.[3]

Spiritual health is probably the most nebulous and abstract of the four health dimensions to be realized.In India, National Institute of Health and Family Welfare (NIHFW), realized this need and initiated a research study in this direction. In this study, an effort was made to define this 4th Dimension of health from a common worldly person's perspective and measure it. 3 Domains, 6 Constructs and 27 Determinants of spiritual health were identified through a scientific process. A statistically reliable and valid Spiritual Health Scale (SHS 2011) containing 114 items has been developed. Construct validity and test- retest reliability has been established.[4]

According to Oxford dictionary, spirituality is defined as relating to or affecting the human spirit or soul as opposed to material or physical things. An individual with high levels of spiritual wellness will experience increased physical, social, and emotional health.

Organized religion and prayer - two concepts most familiar to societies – are considered be a part of spiritual health. Spiritual health also consists of more broad concepts such as hope, purpose, and peace. Other criteria that fall within the category of spiritual

health include belief in a supreme being, unity with a greater force, a guiding sense of meaning, values,balance and introspection. While all of these aspects are not necessary to be spiritually healthy, addressing the main concepts can provide a foundational understanding to this way of approaching one's health.

Overall health can be positively impacted by high levels of spiritual health. For example, people experiencing a life-changing event may deal with their situation in a more positive manner if their levels of spiritual health are high. In other words, people can become more resilient by properly addressing their spiritual health.

In one of the many of this kind of study, 162 Sub-Saharan African women attending an AIDS clinic in Entebbe, Uganda, were asked about coping with their circumstances. The results revealed the importance of indigenous service providers, spirituality and social support. Approximately 85 percent of the women reported that spirituality played some role in their ability to cope. Among these, 43 percent indicated that spirituality was the most important factor that kept them going. The most widely used spiritual coping strategies consisted of support from other believers, prayer, and trusting in God.[5]

Two practices often associated with spiritual health are prayer and meditation. While these concepts have many common characteristics, they can also be considered separately.

Prayer can be formal or informal, may take place individually or in groups, can be silent or spoken aloud, and is most often directed toward some type of deity. Prayer can serve many purposes, from asking for forgiveness to seeking guidance for the individual or others.

Meditation is most often practiced in a quiet setting by an individual. To properly meditate, an individual should sit relatively motionless while thinking or chanting about a particular subject or idea, often known as a mantra. A mantra may be repeated silently or aloud. One of the most common mantras is the term 'Om,' which can be repeated every five to ten seconds during the meditation session. The typical purposes of meditation are to focus the mind, become mindful of the present, to think clearer, and be more centered.[6]

Spiritual health can positively influence other aspects of life.Some observational studies suggest that people who have regular spiritual practices tend to live longer .[7]Another study points to a possible mechanism: interleukin (IL)-6. Increased levels of IL-6 are associated with an increased incidence of disease. A research study involving 1700 older adults showed that those who attended church were half as likely to have elevated levels of IL-6.[8]

The authors hypothesized that religious commitment may improve stress control by offering better coping mechanisms, richer social support, and the strength of personal values and worldview.

Patients who are spiritual may utilize their beliefs in coping with illness, pain, and life stresses. Spiritually inclined tend to have a more positive outlook and a better quality of life. A study on patients with advanced cancer who found comfort from their religious and spiritual beliefs were more satisfied with their lives, were happier, and had less pain.[9]

Spirituality is an essential part of the “existential domain” measured in quality-of-life scores. Positive reports on those measurescorrelated with a good quality of life for patients with advanced disease.[10]

Results of a pain questionnaire distributed by the American Pain Society to hospitalized patients showed that personal prayer was the most commonly used nondrug method of controlling pain: 76% of the patients made use of it.[11]In this study, prayer as a method of pain management was used more frequently than intravenous pain medication (66%), pain injections (62%), relaxation (33%), touch (19%), and massage (9%).

Spiritual beliefs can help patients cope with the idea of death. Among 90 HIV-positive patients, those who were spiritually active had less fear of death and less guilt.[12]

A random Gallup poll asked people what concerns they would have if they were dying. Their top issues were finding companionship and spiritual comfort—chosen over such things as advance directives, economic/financial concerns, and social concerns. Those who were surveyed cited several spiritual reassurances that would give them comfort. The most common spiritual reassurances cited were beliefs that they would be in the loving presence of God or a higher power, that death was not the end but a passage, and that they would live on through their children and descendants.[13]

Bereavement is one of life's greatest stresses. A study of 145 parents whose children had died of cancer found that 80% received comfort from their religious beliefs 1 year after their child's death. Those parents had better physiologic and emotional adjustment. In addition, 40% of those parents reported a strengthening of their own religious commitment over the course of the year prior to their child's death.[14]

Spiritual commitment tends to enhance recovery from surgery. A study of heart transplant patients showed that those who participated in religious activities and said their beliefs were important complied better with follow-up treatment, had improved physical functioning at the 12-month follow-up visit, had higher levels of

self-esteem, and had less anxiety and fewer health worries.[15]

Related to spirituality is the power of hope and positive thinking. In 1955, Beecher showed that between 16% and 60% of patients—an average of 35%—benefited from receiving a placebo for pain, cough, drug-induced mood change, headaches, seasickness, or the common cold when told that the placebo was a drug for their condition.[16]

Herbert Benson, MD, a cardiologist at Harvard School of Medicine, has renamed the placebo effect "remembered wellness".[17]

Spirituality and religion have historically served important roles within cultures and communities. They have helped in coping, surviving, maintaining overall well-being and improving health outcomes. Therefore, to provide holistic care, it is important for health care providers to identify and consider patients' spiritual needs and their relevance to health.

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Mobile Phones and health hazards

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Mobile phone users have increased markedly over a period of few years of November 2011, there were more than 6 billion subscriptions worldwide. According to telecom regulatory authority of India in 2012, mobile phone subscribers base touches 929.37 million people.

The cellular phones operate with Radio Frequencies (RF), a form of electromagnetic energy located on the electromagnetic spectrum between FM radio waves and the waves used in microwave ovens, radars and satellites. The effect mobile phone radiations have on human health is the subject of recent interest probably because of enormous increase in its usage throughout the world.

While an increased risk of brain tumours from the use of mobile phones is not established, the increasing use of mobile phones and the lack of data for mobile phone use over time periods longer than 15 years warrants further research of mobile phone use and brain cancer risk. In particular, with the recent popularity of mobile phone use among younger people, and therefore a potentially longer lifetime of exposure, WHO has promoted further research on this group and is currently assessing the health impact of RF fields on all studied endpoints.

The amount of RF a person is exposed to depends on a number of factors:

- The distance from base station;
- The duration and frequency of phone usage;
- The age of phone
- Older models involve higher exposure than newer digital ones.

There have been various studies between mobile phones and possible health hazards. A study brought out that longer the people used mobile phones, the more likely they were to report symptoms such as hot ears, burning skin, and fatigue. Holding a mobile phone between the raised shoulder and the ear could have a damaging effect on muscles, bones, tendons and discs. Excessive exposure to RF could modify signals in a part of the brain that is responsible for learning and short term memory. Recent studies have shown that there is a link between cell phones and brain tumors. Emissions from mobile phones can disable a safety barrier in blood causing leakage of proteins and toxins into the brain increasing chances of developing Alzheimer's, Parkinson's, Multiple sclerosis etc. Low level radiations cause RBCs to leak hemoglobin causing heart disease and kidney disease. Because of their smaller heads, thinner skulls and higher tissue conductivity, children may absorb more energy from a given phone than adults. Studies indicate that a lot of car accidents have happened, while the driver was on the phone. This is because while driving, one obviously needs to concentrate, and talking on a phone doesn't help.

Recent studies confirm that cell phones can:

- Damage nerves in the scalp.
- Cause blood cells to leak hemoglobin.
- Cause memory loss and mental confusion.
- Cause headaches and induce extreme fatigue.
- Create joint pain, muscle spasms and tremors.
- Create burning sensation and rash on the skin.
- Alter the brain's electrical activity during sleep.
- Induce ringing in the ears, impair sense of smell.
- Precipitate cataracts, retina damage and eye cancer.
- Open the blood-brain barrier to viruses and toxins.
- Reduce the number and efficiency of white blood cells.
- Stimulate asthma by producing histamine in mast cells.
- Cause digestive problems and raise bad cholesterol levels.
- Stress the endocrine system, especially pancreas, thyroid, ovaries, testes.

Some practical approaches for minimizing the hazardous effects of mobile phones on health:

- Buy a low SAR mobile.
- Use mobiles only when there is a strong network.
- Do not use mobile when the battery is low.
- Minimize the duration of use, since certain effects of electromagnetic radiation (e.g. thermal effects on brain) are accumulative.
- Use hands-free to decrease the radiation to the head.
- Keep the cell phone away from the body.
- Do not telephone in a car without an external antenna.
- Limit the use of cell phones by at-risk population (such as children).
- Avoid living near the base stations antennas which are certainly more hazardous than cell phones.
- Never use a cell phone when a conventional phone is available. Use landlines for long talks.

Legal Regulations:

- SAR should not be exceed 2 W/kg By ICNIRP regulations adopted by india (2009)
- SAR should be 1.6W/kg given by interministerial committee formed by IMCIT.
- IDEAL phone SAR 0.2-0.8W/kg

Considering the public health important Government is going to pass strict regulations for Indian manufacturers to mandate all the mobile phones comply with a specific absorption rate so that radiations does not harm human health. Globalization is the new mantra. In this age, it is very difficult not to have technology. But with technology, come certain hazards. The only way to beat these is again, better technology. Electromagnetic radiation is everywhere. More and more wireless communication services (cellular phones, paging, wireless Internet) are expected so is the artificial electromagnetic radiation. It seems that there is no way to reverse this trend. Scientists and engineers are developing better and safer wireless systems and devices. Smaller cell size, better base station antennas and other more advanced technologies will allow future cell phones to radiate much lower power. So one can only hope that cell phone hazards will be reduced.

Ebola Virus Disease (EVD)

Ebola Virus Disease is one of Viral Hemorrhagic Fevers. It is severe, often fatal disease in humans (90%) and nonhuman primates (monkeys, gorillas, and chimpanzees). It is caused by virus of the family

*Filoviridae,*genus *Ebolavirus.* The first Ebolavirus species was reported in 1976 from Democratic Republic of the Congo- Ebola River. Since then, 24 outbreaks appeared sporadically (1976-2012). The four out of the five species have caused disease in humans *viz.* Ebola virus (*Zaire ebolavirus*), Sudan virus (*Sudan ebolavirus*), Taï Forest virus (*Taï Forest ebolavirus*) and Bundibugyo virus (*Bundibugyo ebolavirus*). Reston virus (*Reston ebolavirus*) has caused disease in nonhuman primates. Although the RESTV species found in Philippines and the People's Republic of China can infect humans but no illness or death in humans from this species has been reported to date. The natural reservoir host of Ebola viruses is Fruit bat (*Pteropodidae* family) in Africa. Humans and nonhuman primates are the accidental hosts.

Outbreaks of EVD

Since 1994, Ebola outbreaks from the EBOV and TAFV species have been observed in chimpanzees and gorillas. RESTV has caused severe EVD outbreaks in macaque monkeys (Macaca fascicularis) farmed in Philippines and detected in monkeys imported into the USA in 1989, 1990 and 1996, and in monkeys imported to Italy from Philippines in 1992.

The current outbreak (2014) occurred in West African countries i.e. Guinea, Liberia, Sierra Leone and Nigeria. It was caused by species **Zaire ebolavirus**. In last week of March 2014, The Ministry of Health of Guinea and The Ministry of Health of Liberia notified The World Health Organization (WHO) regarding outbreak of Ebola virus disease. Since then, numbers of EVD cases were reported by these two countries, plus Sierra Leone and Nigeria. During emergency meeting in first week of August 2014, WHO declared current EVD outbreak as "Public Health Emergency of International Concern". The World Health Organization (WHO) reported on 13 August 2014, total of 1,975 cases with 1069 deaths. **Response by Government of India**

All airports in Indiaare on high alert for Ebola. The health ministry has set up a 24-hour emergency helpline (011-23061469/3205/1302) for handling queries. Health officers have been appointed at international airports all over India who were screening passengers (originating/ transiting from affected countries) getting off aircraft. Nearly 44, 000 Indians reside in the regions affected by the deadly disease. In the event that any of these travellers develop symptoms, a surveillance system has been set up to track them. None of the confirmed case of EVD was found in India till now (September 2014). The detailed guidelines regarding EVD were put on home page of websites of Ministry of Health & Family Welfare (www.mohfw.nic.in) and National Centre for Disease Control (www.nicd.nic.in), and same were circulated among health institutions across the country.

Transmission of Ebola virus

Ebola virus is introduced into the human population by close contact with the blood, secretions, organs or other bodily fluids of infected animals. In Africa, infection has been documented through the handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest. Ebola then spreads in the community, either through direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people, and indirect contact with environments contaminated with such fluids. Burial ceremonies in which mourners have direct contact with the body of the deceased person can also play a role in the transmission of Ebola. Men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness.

Early signs and Symptoms of EVD

Incubation Period ranges from 2 to 21 days. The patient starts showing non-specific signs and symptoms with onset of fever, sore throat, muscle and joint pain, headache, stomach ache and lack of appetite. It is followed by extreme weakness, lethargy tiredness, vomiting anddiarrhoea. Finally the severe symptoms appear like bleeding from eyes, ears, nose, bloody vomiting and bloody diarrhoea.

Who is a suspected case: - patient with high grade fever more than 101 degrees F, and having history of travel or close contact with symptomatic person traveling from Ebola Virus Disease affected areas in the past 21 days along with one or more of the following additional symptoms like headache, body ache, unexplained haemorrhage, abdominal pain, diarrhoea and vomiting.

Who is a Confirmed case: A case with the above features and laboratory confirmed diagnostic evidence of Ebola virus infection at a BSL-3 facility by any one of the following: - Ig M (ELISA), Antigen detection, RT-PCR.

Collection, packaging and transportation of samples

The clinical samples should be collected using all universal precautions and handled in specially-equipped, high biosafety level laboratories (BSL 3 plus or 4), accompanied with detailed history of patient on the performa. Before dispatching the sample disinfect the outer surface of container using 1:100 dilution of bleach or 5% Lysol solution and bold labelling of **"Suspect Ebola"** on all vials. Sample should be safely packed in "Triple container" packing and transported under cold chain to the reference laboratory i.e. National Institute of Virology, Pune and National Centre for Disease Control, Delhi with prior intimation. Label should have name, Hospital number/ID number, age and date of collection.

Samples which need to be collected include ante-mortem: blood sample (Serum/Plasma), and post-mortem: tissue sample (liver, spleen, bone marrow, kidney, lung and brain)

Case Management in a Health care institution:

The patient should be isolated. The standard precautions including appropriate Personal Protective Equipments (PPE) should be followed. Visitors should be restricted and environmental infection control

measures should be implemented along with proper disposal of potentially infected material following biohazard precautions.

Currently, no specific therapy is available that has demonstrated efficacy. Therefore only **Supportive Care** including intravascular volume repletion can prevent most of the deaths but IV therapy should be carefully monitored to avoid fluid overload. For high grade fever patient should be treated with only tablet paracetamol. Due to repeated vomiting and diarrhoea patient may present with shock and electrolyte imbalance therefore should be given plenty of oral fluids. Transient bone marrow suppression with leukopenia and thrombocytopenia can result in bleeding from different sites. Therefore may require transfusion with platelets when the count is below 20000/cmm or bleeding from any sites irrespective of platelet count. Patient may require dialysis in severe case of renal failure. Patient may require ICU support for breathlessness due to lung involvement or critical condition. Anti-platelet drugs should be temporarily stopped, as they mightincrease the chances of bleeding. Co-infections should be immediately treated with proper antibiotic. In early stage if co-infection is not treated properly can lead to sepsis & septic shock, which can further result into fatal outcome.

Disposal of Dead Body

Safe disposal of dead body with proper precaution for prevention of transmission of EVD should be done. Ritual activities after death should be strictly avoided. Dead body should be packed with with body fluids.

Anyone who has accidently come in contact impermeable leaky proof body bags for safe disposal and prevention of contamination of the environment with blood or body fluids should be kept under quarantine and observed for 21 days.

Prevention & control

Casual contacts in public places with people that do not appear to be sick do not transmit Ebola. Mosquitoes do not transmit the Ebola virus. Ebola virus is easily killed by soap, bleach, sunlight, or drying. Ebola virus survives only for a short period of time on surfaces that have dried in the sun. Animals should be handled with gloves and other appropriate protective clothings. Animal products (blood and meat) should be thoroughly cooked before consumption. Close physical contact with Ebola patients should be avoided. Gloves and appropriate personal protective equipment should be worn and should be disposed of after use as per bio-safety guidelines. Regular hand washing is required after visiting patients in hospital, as well as after taking care of patients at home. It is not always possible to identify patients with EBV early because initial symptoms may be non-specific. Therefore health-care workers are required to apply standard precautions consistently with all patients regardless of their diagnosis in all work practices at all times.

Measures to be taken in addition to Standard Precautions: When in close contact (within 1 metre) of patients with EBV, wear face protection (a face shield or a medical mask and goggles), a clean, non-sterile long-sleeved gown, and gloves (sterile gloves for some procedures).

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