IMPACT OF COVID 19 ON ENVIRONMENT AND NATURAL RESOURCES: AN OBSERVATIONAL STUDY

Healthcare

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ABSTRACT

The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing global pandemic of coronavirus disease 2019 (COVID 19), caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV 2). COVID-19 needs to be seen beyond just the number of cases or deaths, especially in the context of its impact on air pollution, decline in road traffic accidents, improvement in air and water quality, decline in respiratory infection, nosocomial infections and pediatric chest infections, though some negative effect can be seen on the physical activity and hospital related transmission of COVID-19 to healthcare workers. An invisible virus has shown that it is possible that tangible policies can make world a better place to live in.

KEYWORDS

Environment, COVID-19, air pollution, road traffic accidents, infections

The COVID-19 pandemic, also known as the coronavirus pandemic, is an ongoing global pandemic of coronavirus disease 2019 (COVID 19), caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV 2). More than ten million cases of COVID-19 have been reported in more than 188 countries and territories, resulting in more than 483,000 deaths; more than 4.76 million people have recovered.

Amidst this coronavirus pandemic, it feels like nature always finds the way to heal itself. When everyone is trying to work from home, the majority of the industrial work is on halt and the traffic on roads is less busy and millions of us are cooped up indoors as governments try to curtail the spread of the Covid-19 pandemic, the natural world has continued to rumble on and even shown signs of benefiting from our absence.

COVID-19 needs to be seen beyond just the number of cases or deaths, especially in the context of its impact on air pollution, decline in road traffic accidents, improvement in air and water quality, decline in respiratory infection, nosocomial infections and pediatric chest infections. Though due to the lockdown negative effect can be seen on the physical activity and hospital related transmission of COVID-19 to healthcare workers.

Air pollution

Air pollution in India is a serious health issue. Out of the most polluted cities in the world, 21 out of 30 were in India in 2019. As per a study based on 2016 data, at least 140 million people in India breathe air that is 10 times or more over the WHO safe limit.

The major sectors contributing to air pollution are transport, industries, power plants, construction activities, biomass burning, road dust

resuspension, and residential activities. Besides, certain activities such as the operation of DG sets, restaurant, landfill fires, etc. also contribute to air pollution. [1]

As non-essential activities take a break, the demand for energy has reduced significantly. Maharashtra, one of the most industrialized states in the country, has seen a reduction in power demand from 23,000 MW to 13,000 MW, with industrial load being – yes, zero! Similarly, the sales of petrol have gone down by 17% and diesel by 26 % during this lockdown. All this has brought about a dramatic improvement in air quality. PM 2.5, an ultra-fine Particulate Matter with a size of 2.5 micrometers and a key metric to assess Delhi's toxic air, has gone down by 71% in one week. [2,3]

This impact is not being felt in Delhi alone; on March 29, 91 cities recorded minimal pollution. Residents in Jalandhar, probably for the first time, were able to see the Dhauladhar mountain range from their terraces. Similarly, NCR residents are enjoying a sustained spell of blue skies after more than a decade.

Dhauladhar mountain range was seen from Jalandhar during the lockdown

Studies show that deaths due to Particulate Matter are almost linear with respect to concentration and time. This means that halving the amount of air pollution will halve the deaths caused by it. Based on broad calculations, this means that one month of lockdown would result in saving 35,000 premature deaths due to reduced ambient air pollution.

Road accidents

India has only 1% of global motor vehicles; yet, it accounts for over 10% of global road traffic deaths. Accidents on India's chaotic roads killed more than 151,400 people in 2018, according to official data. There is reportedly decrease in murders too. Taking cognizance of this issue, India joined other countries in becoming a signatory to the Brasilia Declaration, thereby committing to halve the number of deaths and serious injuries from road traffic accidents by 2020.

Forget halving, the numbers of fatalities have only gone up, not only in India but in many other countries of the world. The current lockdown due to COVID has had a significant impact on travel. Google's COVID-19 Community Mobility Reports for India reveal that travel to workplaces has gone down by 47%. Similarly, travel to train stations has decreased by 71%, and travel for retail and recreation has reduced by 77%. [4]

Overall, the COVID-induced lockdown (of a month) in India have probably saved more than 41,000 lives due to reduced air pollution and road accidents. These saved lives will be (hopefully) more than what the virus will kill in the country. Post-COVID-19, India should have cleaner air and safer mobility.

Water quality

The health of national river of India i.e. RIVER GANGA, also considered as the Goddess and mother of Hindu tradition has seen significant improvement since enforcement of nationwide lockdown during COVID pandemic which has led to the reduction in dumping of the industrial waste in it. No people are taking dip in the holy water or dumping waste in it, as a result the water looks clear and even fresh and other marine life can be seen in it.

Test conducted by the scientists and experts of the Central Pollution Control Board has revealed that the water of river Ganga from Dev Prayag (origin of river Ganga) to Hari ki Pauri (famous Ghat on banks of the river in Haridwar) falls under category 'A' which means that the water is fit for drinking. The result indicated that there is no bacteria in terms of MPN/100 ml that identifies the quantity of bacteria commonly referred to as faecal coliform which is an indicator for contamination. Also biochemical oxygen level fell below 3gm/L which is an indicator of good quality of water. [5,6]

Cleaner river bodies in lockdown

Pediatric infection

The pediatric cases of COVID-19 has followed shortly after the adult cases. However, total number of pediatric cases are still less than the adult cases suggesting a protective effect of age. The Chinese reports have suggested that children are less effected by COVID 19 as compared to adult and when children do get symptoms like fever and dry cough and don't usually advance to severe disease [7]. Immunosenescence, the progressive decline in immune function with increasing age is a possible explanation.

Upto one third of reverse transcriptase polymerase chain reaction confirmed that positive pediatric patients remain completely asymptomatic. However, 6% of all positive pediatric patients develop severe/critical illness, with upwards of 11% of infants under the age of 1 year develop severe/critical illness. Since the data on overall pediatric cases are low, data on rare lung diseases like cystic fibrosis and how such children or adult with such diseases react to COVID virus is unknown. Hence certain precautions like giving optimum treatment for underlying lung disease, minimizing cough related to asthma could reduce the potential aerosolization of the virus in an asymptomatic carrier. [8]

Its important to focus on pediatric population as means of preventing disease spread as children is less likely to report the symptoms and more like to have mild or asymptomatic presentations. Such asymptomatic cases can lead to prolonged period of virus shedding. Hence, such cases support the decision for prolonged school closures, prevention of public events and gatherings in an effort to reduce the spread of the virus.

Animal Reserve

Apart from the global pandemic having a ripple effect across the nations, this crisis has also had a deep impact on wildlife. While the world has come to a complete and utter standstill, nature seems to be reclaiming her territory.

It's a very strange time for all of us but conservationists say they have seen some hidden benefits of the restrictions in the natural world.

In Uttarakhand, three Sambar deer were spotted walking on the streets, while a nilgai was found strolling in Noida. An elephant was captured in Uttarakhand's Dehradun, a Small Indian civet was seen in Kerala's Kozhikode, Olive Ridley Turtles came ashore a beach in Odisha, a bison passed through a marketplace in Karnataka, peacocks danced on the streets in Mumbai, and a leopard reached close to an Air Force base near Patna in Bihar. Not just in India, animals have truly come out of the wild across the world.

There is evidence that wild bees have been increased in number due to the decline in air pollution, which can disrupt their ability to smell flowers at a distance. Animals such as foxes, badgers, hedgehogs have been easily spotted in different parts of Europe which earlier was unimaginable.

Wild animals wander through deserted road during COVID lockdown

Circuses including Royal Hanneford, UniverSoul, Jordan World, Carson & Barnes, and Shrine circuses have had to cancel or postpone performances, meaning that elephants, big cats, zebras, camels, and other animals are not being hauled in trucks and trailers. As racetracks cancel events, including even the Kentucky Derby, fewer horses are being run to their deaths. As SeaWorld and Discovery Cove shut their doors, dolphins used for public interactions and rays in touch tanks are not enduring the stress and discomfort of a never-ending barrage of

grabbing human hands. And called-off bullfights mean that bulls aren't being stabbed to death by matadors.

The harmful chemicals released from factories pollute the water resources which also affects the entire life in water. Many species have extinct due to the continuous torture we human beings do to the environment. Now, during these days of lockdown, when the humans are inside and nature outside is breathing, many wildlife species have been spotted in many countries in the streets. These have been the habitat of these animals but humans have stolen it for their use.

Physical activity

Most importantly, experts stress that nature can be beneficial for our mental health as well. Exposure to nature not only makes you feel better emotionally, but it also contributes to your physical wellbeing, reducing blood pressure, heart rate, muscle tension, and the production of stress hormones.

Covid-19 has resulted in reduced physical activity (closure of gyms, swimming pools, limited outdoor movement).

Multiple studies have demonstrated lack of physical activity. Indoor resistance exercises are an alternative, though not many people are accustomed to it. Lack of physical activity has also led to weight gain, increasing BMI, obesity related complication. In an online survey, on effects of home quarantine on eating behavior consumption of unhealthy food, eating in excess, snacking between meals has increased during lockdown. Interestingly binge alcohol drink decreased during quarantine.[9]

Persistent home isolation/limited outdoor movements result in lower exposure to sunlight and reduced levels of vitamin D. Vitamin D is anti-inflammatory and immune modulatory playing an important role in various communicable and non-communicable diseases. Vitamin D deficiency therefore has deleterious effects on disease outcome in addition to increased risk for contracting infections.[10]

Quarantine measures have also resulted in decreased social contact and increased loneliness, and impacted the financial health of large no. of individuals. This has led to increase in mental health disorders such as anxiety, depression and OCDs. This is particularly important in elderly and those living alone. Covid-19 has taught the value of socializing and the support provided by the family in a harsh way. People with existing mental health disorders are the most affected as they have not been able to follow their scheduled OPD visits and also suffered because of non availability of medicines.

There is a need for motivating people to stand up against sedentary lifestyle, eating a healthy and balanced diet and increasing the focus of healthcare policy makers/healthcare providers on mental health.

Nosocomial infections

Hospital related transmission of Covid-19 is an important issue. Health care workers and paramedic including training staff in close contact with infected patients are an important source of possible Nosocomial spread of Covid-19. Out of all the health care professionals infected with Covid-19 upto 20% have been suspected to have hospital related transmission.[11]

The screening and monitoring of health care workers, especially in university hospital were trainees are involved in management of patients, is usually inadequate with no restriction on their physical conditions and personal movement.

A low threshold for quarantine testing is needed in case of exposure and in patients with atypical symptoms (especially in high burden areas) so as to aid in early diagnosis, early isolation, early contact tracing and early treatment.

Therefore, monitoring of health professionals for symptoms such as fever, cough, dyspnea, myalgias, headache etc. in necessary.

Adequate training of medical staff on precautions, donning and doffing of PPE and reducing occupational exposures should be done in all the institutes in a timely manner.

Patient escorts and attendants are another neglected subset of individuals. Therefore, it is important to recognize the risk of person to person transmission of SARS-COV-2.

CONCLUSION:-

An invisible virus has shown that it is possible. Now, it is imperative to make tangible policy changes to ensure that our improvement in air and roads become the norm and not an exception. Otherwise, we'll have to consign ourselves to the next pandemic to revisit these simple but essential joys like birds chirping, walking or cycling blissfully on the roads, or simply gazing at clean, blue skies.

REFERENCES:-

1. M. Amann, P. Purohit, A.D. Bhanarkar, I. Bertok, J. BorkenKleefeld, J. Cofala, C. Heyes, G. Kiesewetter, Z. Klimont, J. Liu, D. Majumdar, Managing future air quality in megacities: a case study for Delhi; Atmos. Environ., 161 (2017), pp. 99-111
2. M.F. Bashir, B. Ma, B. Komal, M.A. Bashir, D. Tan, M. Bashir; Correlation between climate indicators and COVID-19 pandemic in New York, USA; Sci. Total Environ., 728 (2020), Article 138835
3. G. Beig, S.D. Ghude, A. Deshpande; Scientific Evaluation of Air Quality Standards and Defining Air Quality Index for India; Indian Institute of Tropical Meteorology (2010)
4. Agrawal A, Munivenkatappa A, Pal R, Galwankar S, Moscote-Salazar LR, Rubiano AM, et al. Traumatic brain injury registry: Sharing the pilot study experience to foster a multicenter project on traumatic brain injury core data. Indian J Neurotrauma 2019;13:81-7.
5. Ali P, YunusabYoshifumiMasagobYasuakiHijiokab, COVID-19 and surface water quality: Improved lake water quality during the lockdown; Science of The Total Environment; Volume 731, 20 August 2020, 139012
6. P. Häder, A.T. Banaszak, V.E. Villafañe, M.A. Narvarte, R.A. González, E.W. Helbling ; Anthropogenic pollution of aquatic ecosystems: emerging problems with global implications; Sci. Total Environ., 713 (2020), Article 136586
7. Yonker LM, Shen K, Kinane TB. Lessons unfolding from pediatric cases of COVID-19 disease caused by SARS-CoV-2 infection. Pediatr Pulmonol. 2020;55(5):1085-1086. doi:10.1002/ppul.24748
8. Qiu H, Wu J, Hong L, Luo Y, Song Q, Chen D. Clinical and epidemiological features of 36 children with coronavirus disease 2019 (COVID-19) in Zhejiang, China: an observational cohort study. Lancet Infect Dis. 2020 Mar;S1473-3099(20)30198-5.
9. A.lesser ,P.nienhius.The impact of COVID -19 on physical activity behavior and well being of Canadians.env res & public health. May 2020.
10. Chen P,nassisG,harmerP, Li F. Coronavirus disease (COVID-19):The need to maintain regular physical activity while taking precautions. J sport health sciences.2020,9,103-104.
11. BowdleA,Muno Z. Preventing infection of patients and health care workers should be the new normal in the era of novel coronavirus epidemic. Anesthesiology. 2020.