



IMPACT OF HYPOXIA AND MORTALITY DURING THE COVID-19 WAVE 2 IN INDIA - A REVIEW

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ABSTRACT

The variant mutative strained high speed Covid-19, wave 2 is at high risk all over the world including India with day by day new and record breaking peak in mortality rate. The mortality rate due to Covid-19 is severely seen by Hypoxia also. The paper focuses on reasons of mortality due to hypoxia during wave-2 of Covid-19 in India.

KEYWORDS: Covid-19, Covid wave-2, Hypoxia, Variant, Multiple strain, Mortality.

INTRODUCTION

COVID-19 is caused by the SARS-CoV-2 virus, a member of the coronavirus family in the wave-1 in 2020. Since the middle of February, 2021, when daily infections first began to rise, the numbers of daily cases have risen more steeply than they did at any point in the previous year. While the state of Maharashtra dominates case counts at the moment, the numbers of infected all across India continue to rise inexorably, in the classic pattern of a wave-2. The conditions surrounding the lockdown ensured that the disease spread relatively slowly outside these areas. This can be attributed to the relatively slow opening up of the country after about August, 2020 and some reasonable level of compliance with restrictions on public gatherings and masking in the months after that. Shashi, 2020, Devla *et al.*, 2020 and Shekhar, 2020.

MATERIALS AND METHODS

The present paper is based on the backgrounds and present scenario of Covid-19 and Covid-19 pneumonia causes Hypoxia and 'Death Rate' in India during the wave-2 in comparison to wave-1 with the help of valuable and authentic resources through e-newspapers and different webpages returned from a Google search to contribute knowledge for mass people, students, scientists and academicians.

RESULTS AND DISCUSSION

For this knowledgeable study, the following major causes are underlined which is found responsible for increasing mortality in Indian States too.

1. Variants of Covid-19 2. Covid-19 Pneumonia & 3. Hypoxia

1.Variants of Covid-19: Variants of Covid-19 are responsible in 2nd wave as stated all over. Globally, three significant VOCs have been identified, informally associated with the name of the country where they were first noted. They are referred to as the 'UK'(B.1.1.7), the 'South Africa' (B.1.351) and the 'Brazil' (P1) variants, with the terms in brackets being their formal names. Some variants are specific to regions of India, including one called B.1.36, found to be present in a good fraction of cases tested in Bengaluru. The specific mutation carried by the B.1.36 variant, called N440K, is widespread in cases from the southern states. Although data is skimpy, there is some evidence that the B.1.36 variant may be responsible for some reinfections. The B.1.1.7 variant currently dominates new cases in Punjab. Another variant, recently named B.1.617, figures prominently in the sudden increase of cases in Maharashtra. This variant contains two specific mutations, called E484Q and L452R. Both these mutations alter the spike region, allowing it to bind more easily to cells. This variant appears to spread more easily.

Table 1: Indian states: Cases & Mortality (4 May, 2021).

STATE	CASES		ACTIVE		RECOVERED	DEATHS	
Maharashtra	47,71,022	48,821	6,59,013	11,448	40,41,158	68,606	70,851 687
Kerala	16,64,789	28,011	3,46,230	8,447	13,13,109	18,618	5,450 46
Karnataka	16,46,303	44,438	4,44,754	23,288	11,85,299	29,901	16,250 238
Uttar Pradesh	13,42,413	28,062	2,85,832	8,820	10,43,134	28,887	13,447 286
Tamil Nadu	12,28,064	20,862	1,23,258	2,814	10,90,338	18,018	14,468 122
Delhi	12,12,989	18,043	89,592	2,888	11,05,983	20,283	17,414 448
Andhra Pradesh	11,63,994	18,872	1,51,852	8,874	10,03,935	10,227	8,207 71
West Bengal	8,80,894	17,601	1,19,961	1,488	7,49,296	16,837	11,637 88
Chhattisgarh	7,71,701	16,274	1,20,977	810	6,41,449	14,388	9,275 288
Rajasthan	6,51,247	17,288	1,94,371	5,183	4,52,164	11,848	4,712 164
Gujarat	6,07,422	12,820	1,47,499	881	4,52,275	11,989	7,648 140
Madhya Pradesh	6,00,430	12,082	85,750	1,438	5,08,775	13,408	5,905 83
Haryana	5,27,773	12,885	1,04,722	548	4,18,425	13,283	4,526 140
Bihar	5,09,047	11,407	1,07,668	2,278	3,98,558	13,803	2,821 82
Odisha	4,71,536	8,814	65,400	2,421	4,04,063	8,488	2,073 6
Telangana	4,63,361	8,878	79,520	816	3,81,365	7,432	2,476 68
Punjab	3,92,042	8,772	60,709	801	3,21,861	8,018	9,472 166

between people and the picture of some Indian states are witness including highly infected states (Table 1). But more worryingly, recent studies show that the L452R mutation is also capable of immune escape, dodging both antibodies generated by a prior infection or a dose of vaccine as well as other forms of immunity that do not rely on antibodies. <https://sciencethewire.in>.

2. Covid-19 pneumonia: Pneumonia caused by SARS-CoV-2 virus infection is called Covid pneumonia. Normal blood-oxygen level is about 75 to 100 mm Hg. This can be found from a blood test called 'Arterial Blood Gas Test' (invasive test from an arterial blood sample). Saturation of more than 95 per cent is considered normal, any saturation below this is considered abnormal. This can be observed with the help of a pulse oximeter, with the help of a finger probe. There are numerous medical conditions which can cause low oxygen levels and Covid is just one of them.

3. Hypoxia: It is a condition where the tissues are not oxygenated adequately, usually due to insufficient concentration of oxygen in blood. This causes anaemia, asthma, heart failure, chronic obstructive pulmonary disease, lung infection and fluid accumulation in lungs, respiratory distress, allergic reactions *etc.* On the basis of various symptoms, it may be differentiated as arterial hypoxia, anaemic hypoxia, ischemic hypoxia and tissue hypoxia. This infection is known to cause low oxygen

levels but without any development of symptoms. This can be dangerous as crucial time can be lost before admission. Delayed admission has been one of the causes of poor outcomes.

3a. Signs of Hypoxia: The primary signs of hypoxia are restlessness, shortness of breath, cough, fast and slow heart rate time to time, difficulty in breathing, sweating, bluish discoloration of skin, lips and oral cavity *etc.*

3b. Reasons of mortality from Hypoxia: Covid-19 may cause hypoxia without the patient having any symptoms *i.e.* asymptomatic. Velavan and Meyer, 2021 & Parul, 2020. and people wait for symptoms to develop due to mild problem and become late in offering medical care to the patients. One can only monitor such patients at high risk and identify the patients developing low oxygen with the help of a pulse oximeter. Doctors advise patients to keep note of their pulse oximeter 2-3 times daily with a 6 minute walk test (6 MWT). If the saturation is < 94 per cent or there is a significant (> 4 per cent) drop in saturation before and after walking, then they are supposed to seek admission at the closest facility. But due to asymptomatic conditions of the patients, the attendants and patients become careless, watching themselves taking different antibiotics for some days or talking medicines for pneumonia to according to the symptoms and suddenly having severe breathing problems and suffered from hypoxia condition which

finally result heart attack, brain haemorrhage and other physically conditional internal physiological problems due to absence of enough oxygen in the tissues to sustain bodily functions. Recently it is also added in research by National Institute of Health (NIH), America that death due to sudden heart attack during and after treatment of Covid patients increased death rate all over the world including India due to thicker blood and blood clots in Covid-19 patients. According to Cheril Maier, an Assistant Professor of coagulation and transfusion medicine in the pathology and laboratory medicine, department of Emory University School of Medicine, as well as medical director of Special Coagulation Laboratory, 'It has been a mystery why so many patients with Covid-19 have had atypical blood clots. The researchers tested plasma viscosity *i.e.* thickness of blood plasma, in 15 critically ill Covid-19 patients with pneumonia who are admitted to Emory Healthcare intensive care units (ICUs). All of them had plasma viscosity levels above the normal range. The sickest patients had the highest plasma viscosity levels, more than double normal levels and were also more likely to have a blood clot.

3c. Treatment of Hypoxia and Oxygen Therapy:

Treatment of hypoxia needs quick oxygen therapy, treatment of the underlying condition with intravenous steroids or antibiotics and acclimatization (*i.e.* cases who are exposed to high altitude for a while, within the body adapts to the state of decreased oxygen in the air).

Report advocates that Indian states Gujarat, Delhi, Chhattisgarh and Uttarakhand, are effecting more from different symptoms rather than Covid 19. The 2nd wave of Covid 19 pandemic rages young people are now reporting severe lung infections and unpredictable symptoms, doctors across the country have told Suri and Ingale 2021. Young people had been relatively less affected by the pandemic during the first wave last year 2020. Many of them have been reporting 'ground glass opacity' in their lungs, which is a condition where the appearance of the lung changes because of the infection. The fact that several of the variants currently in circulation are more infectious, infecting entire families, could be one reason for the spike in cases in young people, suspect officials at the National Centre for Disease Control (NCDC). In Ahmedabad, severe lung infections and unpredictable symptoms are the two main issues plaguing doctors in Gujarat. More and more younger patients are turning up in the hospital with severe symptoms. Children, who were previously asymptomatic carriers are now coming with severe symptoms. Increased ground glass opacity and the sudden onset of pneumonitis (lung inflammation) are some of the problems that Covid patients in Ahmedabad are facing right now, according to doctors. Some doctors are witnessing what is known as Happy Hypoxia, the patient doesn't know that their blood oxygen level is low and they will keep functioning normally When the drop is too steep, they will simply drop, sometimes dead.

Most of the Covid patients attended showed a severe adverse response on the eighth or tenth day of hospitalisation, calling it a 'worrying trend'. In Chhattisgarh, as in other parts of the country, symptoms have differed in comparison to last year. Last year, people would get discharged in eight days. But now symptoms are surfacing on the eighth day. Last time, the symptoms were only fever, cough, cold and breathing difficulties but now, along with all this, there is a dip in oxygen levels, high fever is persisting and we are seeing blood clots, cardiac arrest, brain haemorrhage as well. Mortality rate among those below 45 years is 25 per cent. In Uttarakhand, it's spreading very fast, and whole families are being affected. Schools have also played a role in spreading the infection among children, although their symptoms tend to be mild and manageable. The disease pattern was more severe this time around, compared to last year when initial symptoms presented were milder. Earlier, people would come with a loss of smell and taste, but now the more prevalent symptoms that first surface are fever and cough. The percentage of people presenting with a fever has increased. So, if we come back on this burning topic, we should take minute care with minute observations of the aforesaid pneumonia, hypoxia and on the whole Covid-19 guidelines of World Health Organisation. WHO, April 2021.

CONCLUSION

It is clear that the novel coronavirus has changed how we live and breathe. The sudden deaths were noticed in patients due to silent hypoxia that went unnoticed. In early September, the All India Institute of Medical Sciences (AIIMS) released a report that showed several patients succumbing to the Covid-19 infection due to sudden cardiac arrest and silent hypoxia that went unnoticed as there is no visible breathing distress. There was a rise in sudden deaths due to dropping oxygen levels, and thrombotic complications such as pulmonary thromboembolism or a blockage of the artery in the lungs. Despite experiencing dangerously low levels of oxygen, many people infected with severe cases of Covid-19 sometimes show no symptoms of shortness of breath or difficulty in breathing. All should take care of it.

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