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Analysis of The Epidemiological Pattern in The Second Wave of Covid-19 At A Tertiary Care Hospital

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Abstract

COVID-19 viral pneumonia has held the entire world in its clutches for more than a year. At the trough of the second wave, the article aims to analyze the pattern of the current wave, the age group and the gender that it commonly affected, the effect of comorbidities, the factors associated with increased mortality and how the pattern differed from that of the first wave. A thorough analysis might help us compare the two waves and formulate ideologies on the manifestations and increase our preparedness towards the impending third wave.

Keywords: NIL.

INTRODUCTION

A Pandemic is defined as an epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people. Clustering of cases of unknown nature were reported from the Huanan Market, Wuhan, Hubei province of China and was notified to the WHO. Since then, there hasn't been any looking back as far as the COVID pandemic is concerned and there has been a wave after wave.

India has been experiencing a massive surge of COVID-19 cases and deaths. As of April 10, 2021, India was the 3rd leading country based on the number of identified cases. The middle of March 2021 marked the beginning of the second wave and the worst affected states were Maharashtra, Tamilnadu, Kerala, Karnataka, Andhra Pradesh, Delhi, Uttar Pradesh and West Bengal.

Through this article, by a retrospective study, we look into providing an overview of the current trend of the second wave of the pandemic and the possible difference, if any, in comparison with the first wave of the pandemic in our hospital. Our main area of concern is in view of the comorbidities and its role in influencing the mortality of the disease.

METHODOLOGY:

INCLUSION CRITERIA: All the patients admitted in covid-19 isolation wards with confirmed swab positivity, swab negative CT-positive patients.

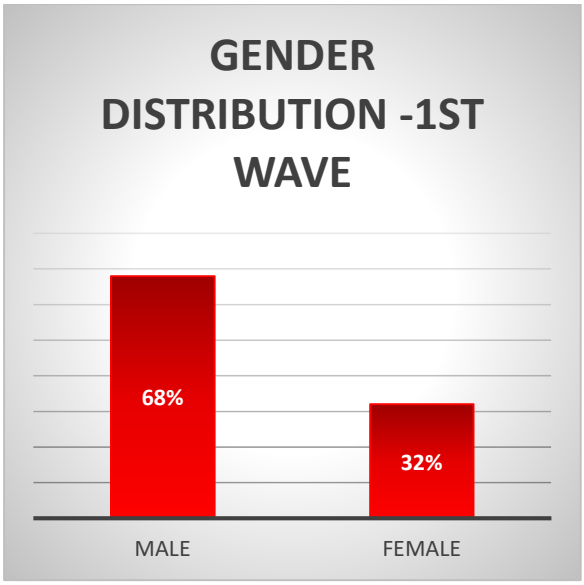
EXCLUSION CRITERIA: Patients admitted with breathlessness due to causes like coronary artery disease, chronic kidney disease, Chronic obstructive pulmonary disease and malignancies with lung metastasis, noxious substance inhalation.

The data was collected retrospectively and the necessary details and analysis were formulated.

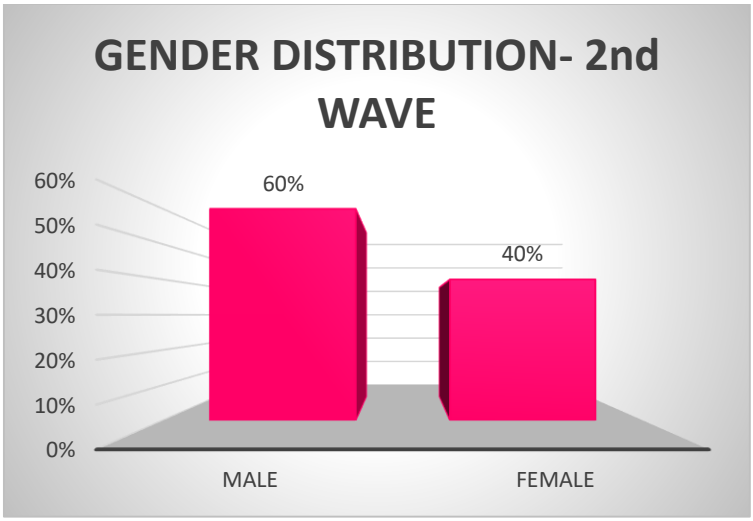
RESULTS AND DISCUSSION:

GENDER DISTRIBUTION:

Out of the 310 cases studied in the first wave, 210 cases were found to be affecting males and the remaining 100 in females.



Among the 421 cases of the second wave, 256 were males and the remaining 165 were females.



On the whole, as an overview the ratio of female to male cases has increased to a significant number in the second wave of the pandemic. The possible explanations could be because of the increased exposure of men to the first wave and thereby acquiring a better immunity in comparison to women.

Sandeep et al., in their article regarding the attitude of the general public of India towards the covid vaccination have highlighted the fact that the males were more likely to accept the COVID-19 vaccines when compared to females. This fact could also serve to be a plausible explanation to the proportional increase in the number of females acquiring the disease in the second wave.

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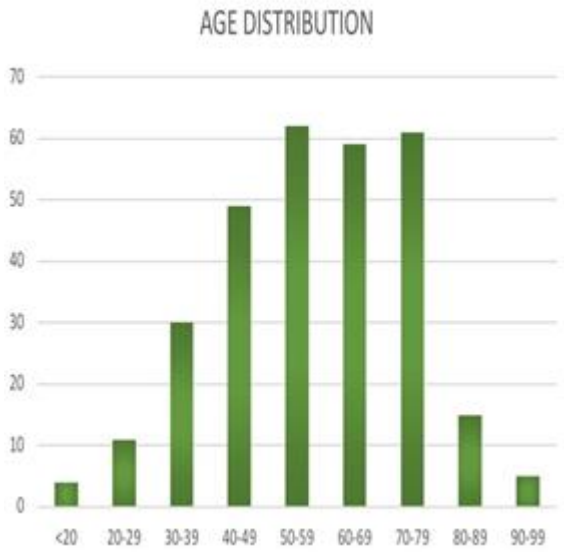
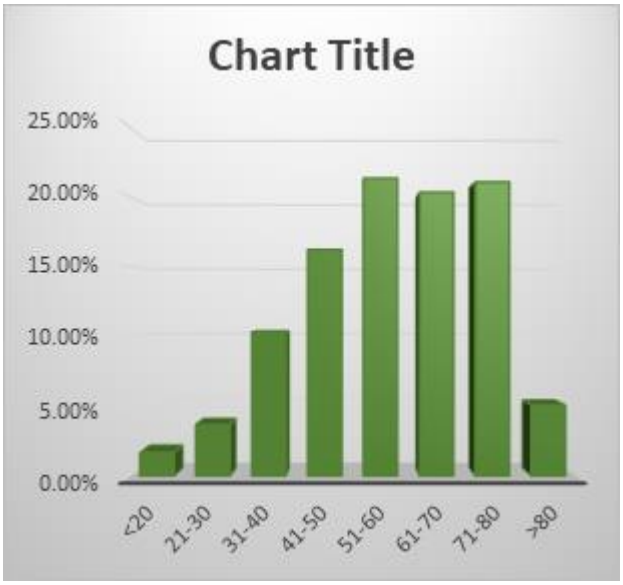
AGE DISTRIBUTION:

FIRST WAVE





SECOND WAVE

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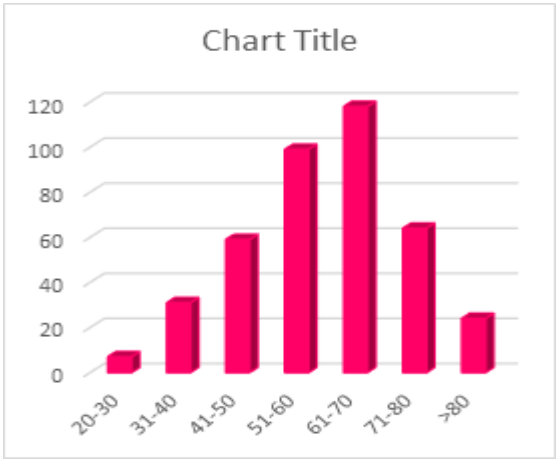
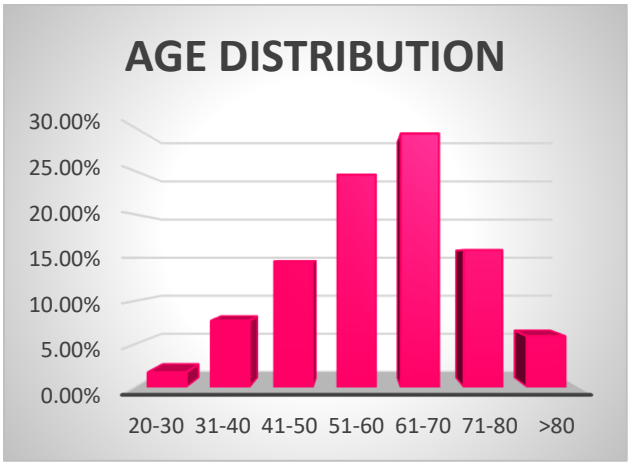
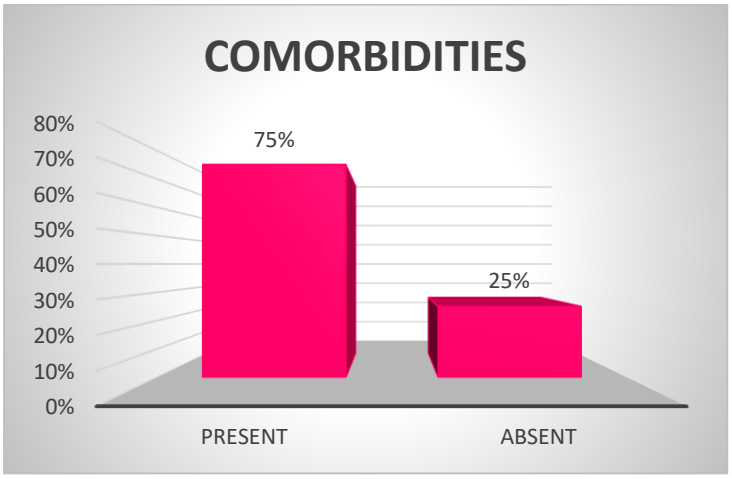




IN comparison, the proportional involvement in the extremes of age have reduced and the second wave has had a fairly clustered involvement among those of age 40-70

ASSOCIATION WITH COMORBIDITIES

COVID-19 patients with diabetes, hypertension, Chronic Obstructive Pulmonary Disease (COPD), cardiovascular diseases (CVD) malignancies, HIV etc could develop life threatening complications. This is in part attributed to the greater expression of ACE-2 receptors by some diseases when compared to others.



Among the entire spectrum of patients who succumbed to the illness, it was noted that 75% of the patients had at least one comorbidity while 25% died despite the absence of comorbidities.

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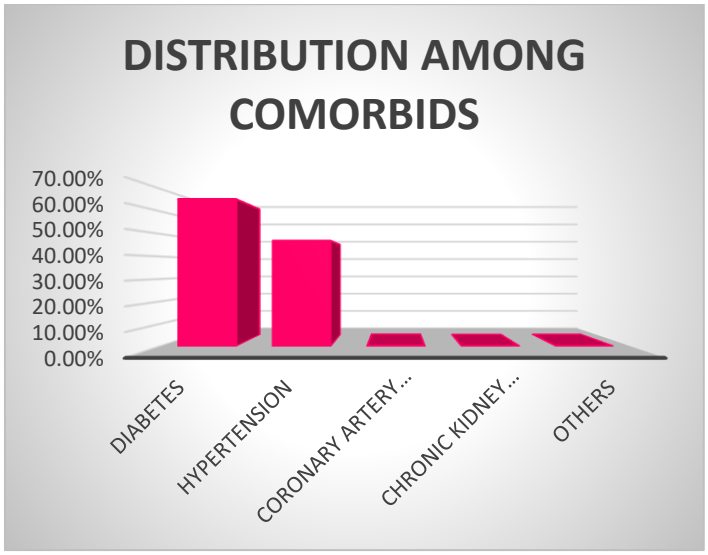
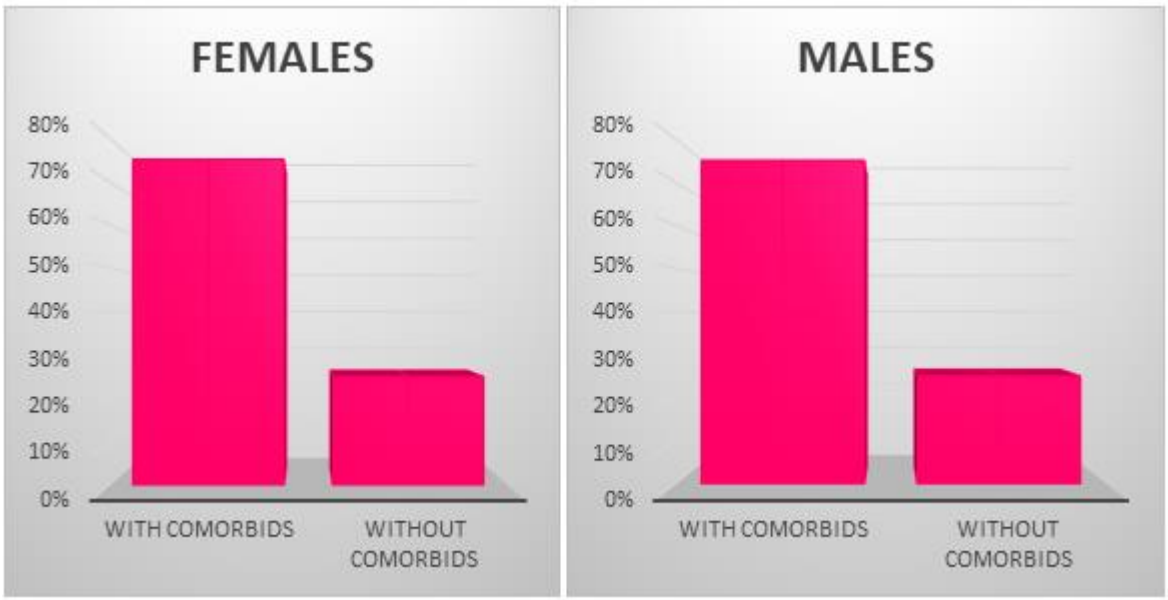
Among the 75% of the patients with comorbidities, the distribution were as below:

DIABETES	206	65.40%
HYPERTENSION	148	47%
CORONARY ARTERY DISEASE	61	0.20%
CHRONIC KIDNEY DISEASE	27	0.08%
OTHERS	35	0.10%



Among those with comorbidities, the percentage of men and women affected did not vary to a significant amount.



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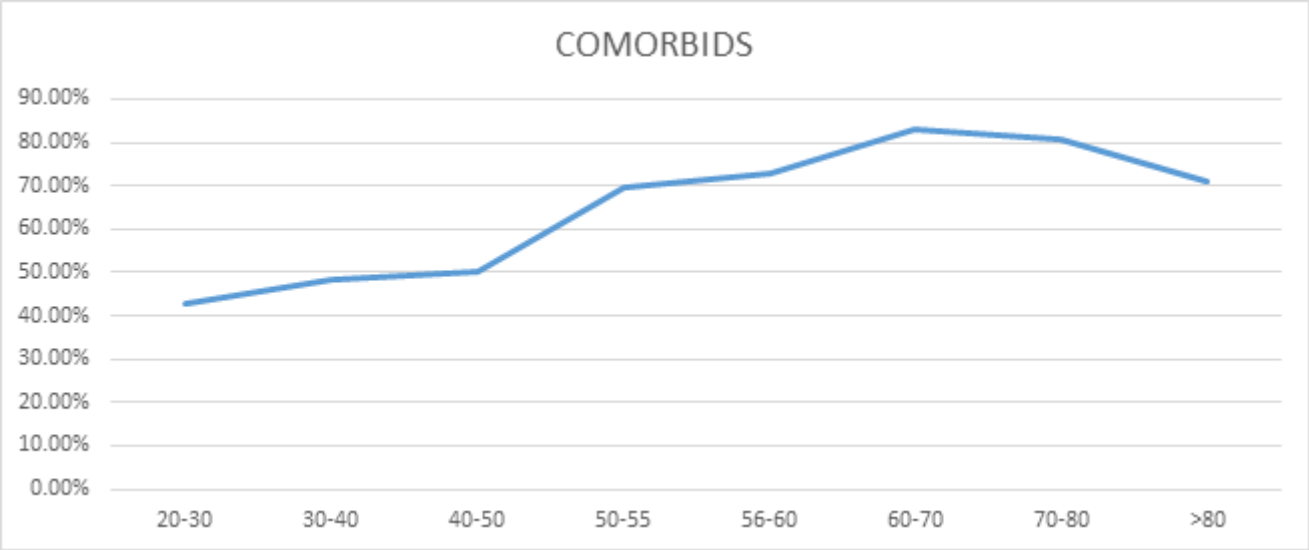

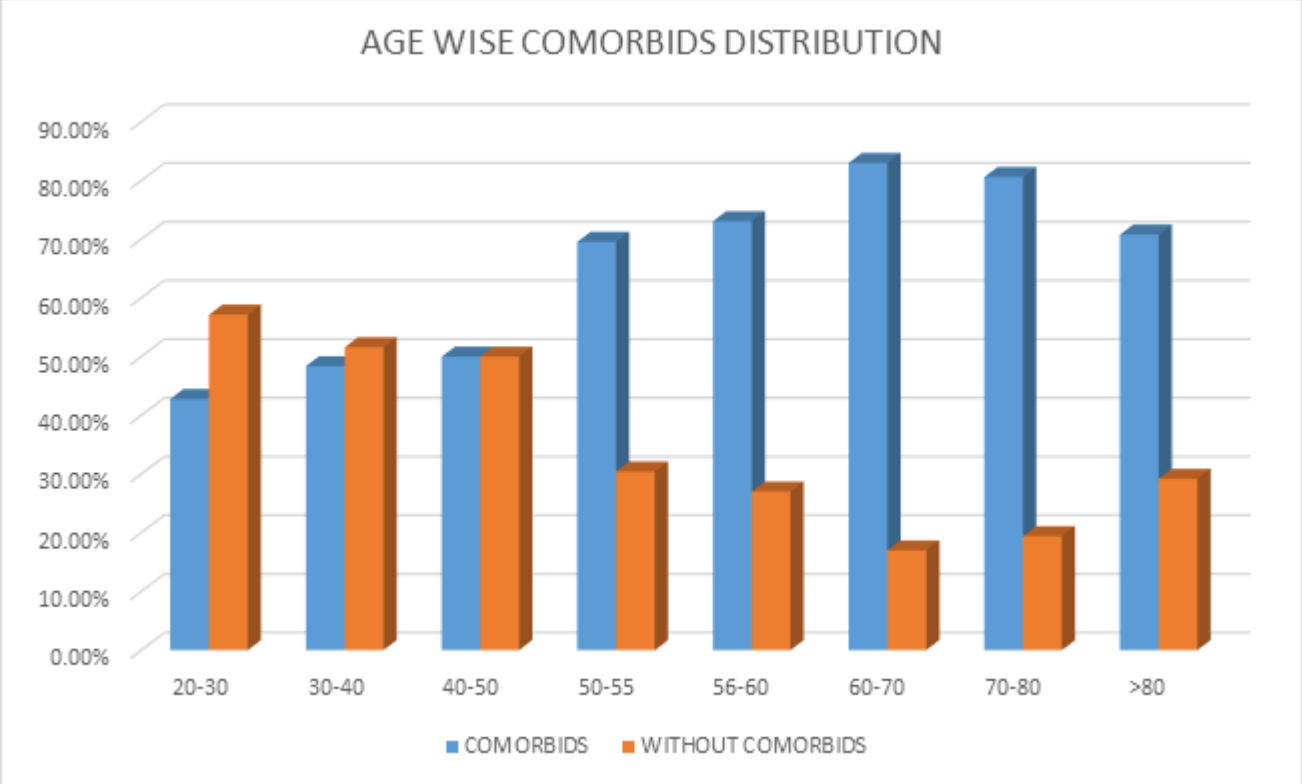

From the above graph, the following conclusions can be made:

1. Among the aged individuals, the disease was found at a higher prevalence among those with comorbidities.
2. While on the other hand, in the young individuals of age 20-30 years and in the middle-aged population, the disease prevalence among the patients without comorbidities is in par or sometimes even higher than the ones with comorbidities.

This could possibly be attributed as per Xie Xudong et al. to the higher number of ACE receptors among the young individuals when compared to the older patients.

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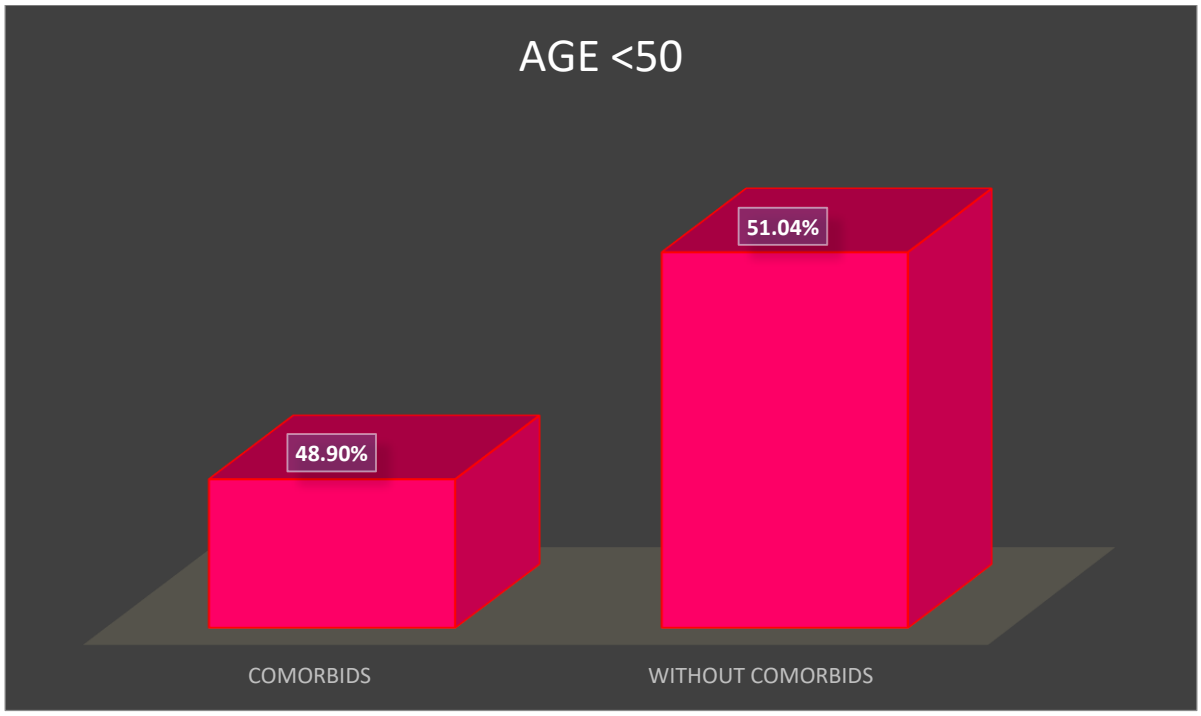
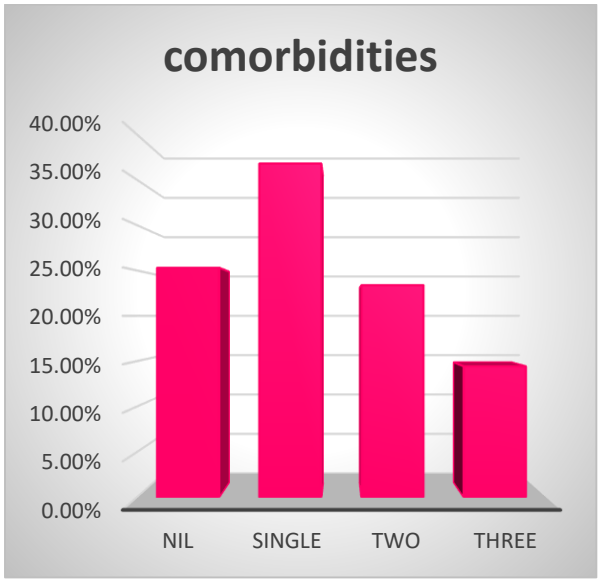
The number of people with comorbidities increased in proportion to the age as expected, however on the contrary, it was brought to notice that among the many deaths that occurred in individuals below the age of 50 (considered as young age deaths) occurred among those who had NO comorbidities and is of statistical significance.



Out of the covid patients that succumbed to the disease in the second wave, majority had only one comorbidity.



The point of significance is that diabetes was the most common comorbidity which determined mortality even in patients with a single comorbidity.

From the above graph a conclusion can be made that the mortality didn't increase in proportion to the number of comorbidities and in reality, those with a single comorbidity, especially if diabetic, were at an increased risk for a poor outcome.

CONCLUSION:

From the above analysis, point of significance is that the difference in gender distribution, with a higher

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male prevalence is narrowing down in the second wave. Multiple factors like increased exposure of males in the first wave, higher prevalence of vaccine hesitancy among females could be sighted as possible reasons.

The age distribution has also shifted in favour of the middle aged population plausibly because of the higher expression of ACE receptors, higher chance of contracting the virus due to lack of strict quarantine among individuals of these age groups.

It can also be attributed to the lesser number of vaccinated individuals in these age groups.

Comorbidities are a major role in affecting the outcome of the disease with diabetes being the most feared of all. The number of comorbidities in the individual didn't proportionally increase the mortality associated. In the second wave, what was dreaded is the increased number of deaths below the age of 50 years and majority in this category didn't have any documented comorbidities.

World Health Organisation

In conclusion, the impending third wave might target a younger population, expected to be affecting a large number of individuals below the age of 40 years and the only way to reduce the number of the affected individuals is effective and efficient vaccination protocols.

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