A Meta-Analysis Based Study on the Outcome of Age on Mortality Among the Covid-19 infected Railway Staffs of Sambalpur Division, Odisha, India

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ABSTRACT

Background: In December 2019 China declared that pneumonia caused by a novel coronavirus. The transmission of the virus from human to human causes a high rise in death rates around the globe. All though all age types can be infected with COVID-19, a person aged above 65 years showing more risks of growing serious illness, mostly due to increasing health conditions that are expected to come with ageing. Observing that older adults are at more risk for COVID related medical problem and mortality, the current study targeted the age-related effect on COVID-19 patients of Sambalpur Railway Staffs of Odisha.

Objective: The present study focuses on the age-related effect on COVID-19 patients of Sambalpur Railway Staffs of Odisha. We performed a meta-analysis based on the clinical features of the Railway Staffs of Sambalpur division, Odisha.

Methods: All investigations were carryout utilizing STATA 14.3 (StataCorp. 2009. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP). A whole of 5732 employees was analyzed out of which 337 were found to be infected with COVID-19, among which, 323 (95.84%) were males and 14 (4.15%) were females.

Results: The most noteworthy mortality was seen in patient's ≥ 60 -69 years of age. The age group had altogether big mortality contrasted with the immediate age group. The biggest expansion in mortality hazard was seen in patients with age 60-69 contrasted with 50-59.

Conclusion: Notable heterogeneity ($p < 0.001$) was noticed and concluded the Funnel Plot. In our result, it was observed that the age group 30-39 had a significantly higher mortality rate.

Key Words: Mortality, Age, COVID-19, Meta-Analysis, STATA 14.3

INTRODUCTION

In December 2019, some unidentified cases of pneumonia were reported in Wuhan, Hubei province, in the mainland Republic of China. Some characteristic features of this disease were similar kind to viral pneumonia. After analyzing the respiratory sample, the Centre for Disease Control, China has been declared that as novel coronavirus pneumonia caused by novel corona virus.^{1,2} The novel coronavirus has a high rate of infection, transmission and mortality as compared to other viruses.³ The transmission of the virus from human to human causes a high rise in death rates around the globe. Acute lungs injury at all stages of life or in some individuals with high-risk was reported earlier shows that, such as old age people or those persons affected with multi-mor-

bilities, this novel virus can cause the serious pneumonia-like condition, acute respiratory distress syndrome (ARDS), followed by multi-organ failure, these factors are the main cause of acute respiratory failure with higher death rates. All though all age types can be infected with COVID-19, a person aged above 65 years showing more risks of growing serious illness, mostly due to increasing health conditions that are expected to come with ageing (European Centre for Disease Prevention and Control, 2020).

Also, public registries have exhibited a tremendous death rate between patients more than 80 years of age.⁴⁻⁶ Hence, older individuals seem to have an unreasonable extent of serious cases of COVID-19 and lethal impact. Though it is frequently concluded that older adults are higher change-averse

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than their younger complement, the results are mixed. Observing that older adults are at more risk for COVID related medical problem and mortality, the current study targeted the age-related effect on COVID-19 patients of Sambalpur Railway Staffs of Odisha.

MATERIALS AND METHODS

The study was carried out for three months (21st July – 21st October 2020) to observe the rate of COVID-19 infection among the Sambalpur Division Railway Employees of Odisha. In our study month-wise, clinical features of the Sambalpur Division Railway Employees of Odisha features were analyzed. A total of 5732 employees were analyzed out of which 337 were found to be infected with COVID-19. We analyzed the data from July to October 2020. We performed a meta-analysis of the clinical features of the Sambalpur Railway Staffs of Odisha. Therapeutic highlights and death rates were convenient in all investigation. The investigation precise standard errors for the evaluated odds ratio were cast-off to demonstrate the inside-study difference. The rate of alterability across investigations accessible to heterogeneity hyper possibility was determined utilizing the I² statistic. Whenever heterogeneity was noticed and presuming that the study outcome sizes were unlike also that the collected investigations described a random sample from a huge population, all the study carried out by a random-effects model. To recognize the possible origin of heterogeneity, sensitivity analyses were carried out within investigations with meta-regression study and the Harbord test, to evaluate the small-study result. The entire study was carried out using STATA 14.3 (StataCorp. 2009. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP).

RESULT

In our study month, wise clinical features of the Sambalpur Division Railway Employees of Odisha features were analyzed. A total of 5732 employees were analyzed out of which 337 were found to be infected with COVID-19, the maximum number of patients within the age group of 40-49 year out of which 323 (95.84%) were males and 14 (4.15%) were females (Table 1). A total of 1 patient was under the age group of $\geq 60-69$; the percentage of the older staff ($\geq 60-69$) was nil for July, August and October whereas 1 patient was found in September during the total period of study. Comparable to the age, $<1\%$ mortality was observed in <50 aged patients and it increases expanding after that age. Being familiar, the maximum mortality rate was noticed in patient's $\geq 60-69$ age (Figure 1a). Age groups had seriously big mortality in contrast to the immediately younger age group. A maximum rise in mortality hazard was seen among the patients

with age 60-69 contrast to 50-59 (Figure 1b).

Notable heterogeneity ($p < 0.001$) was noticed and, the Funnel Plot was concluded (Figures 2 & 3a,b). In our result, it was observed that the age group 30-39 had a significantly higher mortality rate.

DISCUSSION

We performed a meta-analysis of the clinical features of the Sambalpur Railway Staffs of Odisha. The metanalysis data presently obtainable from public and territorial reports of Covid-19 infected patients, spotlight the result of age on mortality. Recent outcomes have a major therapeutical association like certain protective action and the therapeutical management of covid-19 patients. As the beginning of the epidemic, age has been characterizing as chief anticipation chosen among the Covid-19 patients.

Our investigation of 337 patients indicates mortality rise complementary to age; which is visible in patient's $\geq 60-69$ years, rising notably in a single decade of life. Hence, the most noteworthy mortality takes place within the patient's $\geq 60-69$ in those compared to junior patients. The above-mentioned discovery is steady with a more affectability to the disease and genuine therapeutical manifestations noted in old patients.^{7,8} This reality could be affected by both the physiological ageing procedure and generally, the more prominent predominance in useful reserve that decrease intrinsic size and elasticity and hampered the battle against contaminations.⁹ In this content, co-morbidities, for example, cardiovascular infection, hypertension, and diabetes are exceptionally common in the older and have been related with most awful results in Covid-19.⁷ A numerous techniques underlying this more awful forecast in older patients with Covid-19 may clarify our outcomes that may prompt further research.¹⁰

In our study, it was observed that the age group 30-39 had a significantly higher mortality rate. Our study is based on Railway staffs, so maybe the age between 30-39 are more mobile in the workplace due to which they are more exposed to the infection or maybe some other diseases associated with these age group so that the mortality rate is significantly more. Another reason may be due to regular smoking and alcohol consumption which may be very common in this age group. A data intelligence team (DIU) of India Today, has compared the age profile of Covid-19 cases with the population distribution in India. The analysis shows that under the age of 40 years, most of the infected cases are from the age group 21-40. Nearly 44 per cent of Covid-19 cases fall under this age group, which is almost 35 per cent of India's population and are considered as working youth population with high mobility. In the age group of 21 to 30, around 22 per cent of people have been infected with coronavirus while

their estimated representation in the population is about 20 per cent. Similar is the case with the 31-40 years age group bracket, which is 15 per cent of India's total population. The prime reason for infection at a young age is because of their mobility to the workplace, and another possibility would be the lack of self-protection. A higher proportion of the young population compared to older people is also one of the reasons.

CONCLUSION

The meta-analysis of the present accessible data recommends a determinant impact on age in mortality of Covid-19 patients with a pertinent limit on age >50 and particularly >60. More therapeutical and fundamental research is expected to explain the system associated with the COVID-19 infection among the aged patients and to create methodologies to aid results in these patients.

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Manoj Kumar Behera and T Sujata. Dattatreya Kar performed the data analysis statically, executed data representation (graphical and tabular) and wrote the manuscript.

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Table 1: Month wise Clinical features of the Sambalpur Railway Staffs of Odisha.

	July	August	September	October
N	15	34	201	87
Fatality, n(%)	0,0	0,0	6, 2.98%	4, 4.59%
Hospitalised	14	17	35	10
Home isolation	1	17	166	77
Sex,Male	13	33	196	81
Sex,Female	2	1	5	6
Age groups	0	3	17	8
Age <29				
Fatality	0	0	0	0
Age 30-39	9	11	60	25
Fatality	0	0	5	0

Table 1: (Continued)

	July	August	September	October
Age 40-49	3	14	75	28
Fatality	0	0	1	0
Age 50-59	3	6	46	26
Fatality	0	0	0	4
Age 60-69	0	0	1	0
Fatality	0	0	0	0

Figure 1a: Pie chart of patients according to age groups.

Figure 1b: Pie chart of patients mortality rate according to age.

Figure 2: Forest plots showing the pooled odds ratio (OR) with 95% confidence intervals of mortality for each age group.

Figure 3a: Funnel plots.

Figure 3b: Contour-enhanced funnel plot showing the mortality for each age group.