

Are covid-19 related deaths taking time? A Retrospective analysis in a state covid 19 centre at tirupathi

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Abstract

The COVID-19 pandemic, also known as the corona virus pandemic, is an ongoing phenomenon caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). Older people and those with underlying comorbidities like cardiovascular disease, diabetes, chronic respiratory disease, or cancer are more likely to develop serious illness. India reported its first case of COVID-19 on 30th January 2020. Since that lakhs of persons have been infected with COVID-19 and thousands died in India as well.

INTRODUCTION

The COVID-19 pandemic, also known as the corona virus pandemic, is an ongoing phenomenon caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). Older people and those with underlying comorbidities like cardiovascular disease, diabetes, chronic respiratory disease, or cancer are more likely to develop serious illness. India reported its first case of COVID-19 on 30th January 2020. Since that lakhs of persons have been infected with COVID-19 and thousands died in India as well.

The present statistical data shows that there were a total of 4.33 crore covid positive cases and about 5.27 lakh deaths in which nearly 23.4 lakh covid affected persons and about 14733 deaths occurred in Andhra Pradesh.

Kumar R et al done a study In civil hospital Jalandhar in 39 cases of COVID-19 positive along with suspects during lockdown/curfew period with the aim to analyse the deaths during the lockdown period of 23/03/2020 to 31/05/2020. In his study Males constituted 57% of the patients. Comorbid conditions were Diabetes mellitus and Respiratory diseases. The most numerous patients were from 21- 30 years age group. Death rate was 3%.¹

Rajeev Jayadevan done a multi-pronged search was made in all reported deaths which are linked to COVID-19 among doctors in India. Of the 104 non-violent deaths, 55.5% were below 60 years of age, while 29.6% and 21% were below the age of 50 and 40 respectively. The average age at death was 56.3 (range 22 - 96). Over half of the deaths occurred among general practitioners, while surgical specialties accounted for 27% of the mortality.²

Cortis D done a study on age distribution in corona Pandemic and noted higher morbidity in younger individuals and higher mortality for the elderly. He noticed that the relative number of elderly contracting the virus is more than the proportion of elderly in the population.³

Many studies have done on the common cause of deaths 4, age distribution, comorbidities 5 in covid 19 deaths, to our knowledge there was no study on the period of survival exclusively after admission with covid19 disease. Hence, we have undertaken this study to know the period of survival in covid 19 diseases after admission.

This study may be helpful in analysing the individuals who are at risk bearing particular comorbidity so that physicians can concentrate more on these comorbidities.

With this back ground the objective of this study were to study the period of survival in the hospital among the different age groups individuals after admission, to identify the most common cause of death in covid suspect and confirmed individuals and to determine the association of period of survival in covid 19 patients with demographic variables, cause of death and comorbidities

Materials and Methods:

The present study was a retrospective observation study conducted in Sri Venkateswara Institute Of Medical Sciences, Tirupati Andhra Pradesh a tertiary care hospital from April 2020 to March 2021 (12 months). This study included All death cases of covid positive and suspect during the study period reported in hospital, subject to inclusion and exclusion criteria. Inclusion criteria were all the cases and suspects who got admitted in the institution with covid-19 positive and died during the hospital stay will be included in the study. Exclusion criteria were all patients who succumbed due to other than covid -19 disease and unknown deaths which were not claimed.

From the hospital records all deaths which satisfying inclusion criteria were obtained. The following data was collected from the hospital records: age, gender, occupation, time of death, survival period of the victim after admission and cause of death, other comorbidities like diabetes mellitus, hypertension, renal failure, COPD, rheumatoid arthritis, ischemic heart diseases.

The study was conducted after obtaining ethical committee approval; Prior permission was obtained from the medical superintendent and the Medical record department following it case records were evaluated for the parameters aimed.

The data was entered in Microsoft excel version 7.0. Qualitative variables were presented as presented as frequencies and percentages. Chi-square test was used to test significant difference between proportions. Multivariate binary logistic regression was used to predict the survival period with other variables. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp was used for statistical analysis. P-value < 0.05 was considered as statistically significant.

Results

The present study was conducted in a tertiary care hospital Sri Venkateswara Institute Of Medical Sciences, Tirupati Andhra Pradesh. In this study, a total of 646 COVID-19 patients have been studied and following observations were drawn. The findings obtained after studying the collected data, from which systematic and statistical analysis has been done and discussed further.

Table 1 shows the demographic details in which it is observed that, among the study population, maximum were in >60 years age group accounting for 342 (52.9%) cases and least being <18 years (4 cases-0.6%). WITH RESPECT TO GENDER majority were male (478-76%) and female patients accounted for 168 (24%). Unemployed persons were the highest n=347 (53.7%) in number among the 646 patients. The employed were the next highest (n=134, 20.7%). Housewives were 130 (20.1%), students were 35 (5.4%). WITH RESPECT TO TIME OF DEATH In our study the time was divided into four periods of 6 hours interval i.e. 0-6 hours, 07-12, 12-18, and 18-24. Most of the deaths were noted during 0-6 hrs. It is observed that number of persons who died after 72 hours and within 7 days (174 cases 26.9%) from the time of admission was maximum, which was subsequently followed by death after 7 days (153 cases 23.7%).

Table 1: demographic details

Variable		Number	Percentage
Age group (years)	<18	4	0.6
	18-30	21	3.3
	31-40	34	5.3
	41-50	90	13.9
	51-60	155	24.0
	>60	342	52.9
Gender	Male	478	74
	Female	168	26
Occupation	Unemployed	347	53.7
	Student	35	5.4
	Housewife	130	20.1
	Employed	134	20.7
Time of death (hrs)	0-6	170	26.3
	7-12	154	23.8
	12-18	169	26.2
	18-24	153	23.7
Survival period after admission	0-6 hrs	73	11.3
	6-12 hrs	30	4.6
	12-24 hrs	98	15.2
	24-48 hrs	65	10.1
	48-72 hrs	53	8.2
	3-7 days	174	26.9
	>7 days	153	23.7

From table 2 data it is observed that among 646 patients, 355(55%) cases died due to hypoxia accounting for the most common cause of death, followed by ARDS which accounted for 124 (19.2%) cases and CV failure 105 (16.3%) cases. 11 deaths (1.7%) were reported due to Sepsis and 14 (2.2%) due to Septic MOF. 10 (1.5%) deaths attributed to other causes. The following comorbidities attributed to the risk of COVID -19 related deaths, highest being Diabetes mellitus (298) followed by hypertension (292), Renal failure (92), IHD (58), COPD (27), RA (3) and least being patients on Chemoradiotherapy (1).

Table 2: Cause of death and comorbidities

Variable		Number (N=646)	Percentage
Cause of death	ARDS	124	19.2
	Hypoxia	355	55.0
	Sepsis	11	1.7
	Septic MOF	14	2.2
	CV failure	105	16.3
	Other causes	10	1.5
Comorbidities	Diabetes mellitus	298	46.1
	Hypertension	292	45.2
	Renal failure	92	14.2
	COPD	27	4.2
	RA	3	0.5
	Chemoradiotherapy	1	0.2
	IHD	58	9.0

Table 3: Association between survival period and demographic variables, cause of death and comorbidities

Variable		Survival period		Total No. (%)	P value
		<24 hours No. (%)	>24 hours No. (%)		
Age	<40 years	20 (33.9)	39 (66.1)	59	0.628

	>40 years	181 (30.8)	406 (69.2)	587	
Gender	Male	160 (33.5)	318 (66.5)	478	0.029
	Female	41 (24.4)	127 (75.6)	168	
Occupation	Unemployed	112 (32.3)	235 (67.7)	347	0.665
	Student	10 (28.6)	25 (71.4)	35	
	Housewife	35 (26.9)	95 (73.1)	130	
	Employed	44 (32.8)	90 (67.2)	134	
ARDS	Yes	48 (38.7)	76 (61.3)	124	0.042
	No	153 (29.3)	369 (70.7)	522	
Hypoxia	Yes	101 (28.5)	254 (71.5)	355	0.106
	No	100 (34.4)	191 (65.6)	291	
Sepsis	Yes	6 (54.5)	5 (45.5)	11	0.090
	No	195 (30.7)	440 (69.3)	635	
Septic MOF	Yes	2 (14.3)	12 (85.7)	14	0.169
	No	199 (31.5)	433 (68.5)	632	
Septic shock	Yes	6 (20)	24 (80)	30	0.178
	No	195 (31.7)	421 (68.3)	616	
CV failure	Yes	35 (33.3)	70 (66.7)	105	0.592
	No	166 (30.7)	375 (69.3)	541	
Diabetes	Yes	95 (31.9)	203 (68.1)	298	0.698
	No	106 (30.5)	242 (69.5)	348	
Hypertension	Yes	89 (30.5)	203 (69.5)	292	0.751
	No	112 (31.6)	242 (68.4)	354	
Renal failure	Yes	41 (44.6)	51 (55.4)	92	0.002
	No	160 (28.8)	384 (71.2)	554	
COPD	Yes	8 (29.6)	19 (70.4)	27	0.865
	No	193 (31.2)	426 (68.8)	619	
RA	Yes	1 (33.3)	2 (66.7)	3	0.934
	No	200 (31.1)	443 (68.9)	643	
Chemoradiotherapy	Yes	0 (0)	1 (100)	1	0.501
	No	201 (31.2)	444 (68.8)	645	
IHD	Yes	17 (29.3)	41 (70.7)	58	0.756
	No	184 (31.3)	404 (68.7)	588	

Table3 shows that gender, ARDS and renal failure were significantly associated with the survival period. Majority of study subjects who were males (33.5% vs 24.4%), with ARDS (38.7% vs 29.3%) and with renal failure (44.6% vs 28.8%) were significantly died within 24 hours. Other demographic variables, cause of deaths and comorbidities were significant for survival period.

Table 4: Binary logistic regression for predicting survival period with demographic variables, cause of death and comorbidities

Variable		Crude Odds ratio	Adjusted Odds ratio	P value	95% confidence intervals	
					Lower	Upper
Age	<40 years	1.150	0.862	0.632	0.471	1.579
Reference ->40						
Gender	Male	1.559	0.613	0.020	0.406	0.926
Reference -Female						
ARDS	Yes	1.523	0.829	0.642	0.376	1.828
Hypoxia	Yes	0.759	1.334	0.451	0.631	2.821
Sepsis	Yes	2.708	0.404	0.167	0.111	1.462
Septic MOF	Yes	0.363	3.178	0.157	0.640	15.782
Septic shock	Yes	0.540	2.036	0.212	0.667	6.211

CV failure	Yes	1.130	1.052	0.903	0.467	2.372
Diabetes mellitus	Yes	1.068	0.880	0.511	0.601	1.288
Hypertension	Yes	0.947	0.972	0.885	0.663	1.426
Renal failure	Yes	0.420	2.471	0.002	1.384	4.412
COPD	Yes	0.929	0.958	0.925	0.389	2.357
RA	Yes	1.108	0.944	0.963	0.080	11.122
IHD	Yes	0.910	1.370	0.321	0.736	2.547

Table 4 showed that male gender (AOR 0.613, 95% CI 0.406-0.926) and renal failures (AOR 2.471, 95% CI 1.384-4.412) were significant predictors for survival period.

DISCUSSION

Because of the mutability of the corona virus it is to be known that the pandemic is not yet completed more over it poses a serious threat as well. The pandemic of covid disease which was originated with suspicion in bats from china in 2019 later it spread the world and has given risk and mortality to the comorbidities individuals as well as the normal individuals.

The present study showed that out of 646 cases males outstripped over females (74% vs 26%) with a ratio of 2.846:1 in all age groups. Most commonly involved age group was >60 years (n=342,52.9%), followed by 51-60 years (n=155,24%), 41-50 years (n=90,13.9%), 31-40 years (n=34,5.3%), 18-30 years (n=21,3.3%), <18 years (n=4,0.6%).

In a meta-analysis study published by Subodh Sharma Paude it was analysed in some articles and found most of the patients were in the middle and old age group with males outweighing the females. (6)

The age group of more than 60 years was the most vulnerable period of life. The reason could be attributed to the low immunity levels. It is noted that the Unemployed persons were in increased number in the study population. The employed were next in number followed by housewives, students. Our study identified unemployed persons are at higher risk. The less deaths in employed persons can be attributed to work from home.

In this study most of the deaths has occurred during 0-6 hours followed by 12-18 hours and least during 18-24 hours. With regard to period of survival after admission persons who died after 72 hours and within 7 days (n=174, 26.9%) from the time of admission was maximum, which was subsequently followed by death after 7 days (n=153, 23.7%) with least being 6-12 hours (n=30, 4.6%). Elezkurtaj S observed almost equal days of survival for sepsis, ARDS, septic shock. (7)

When the demographic details from (table 3) Age, gender and occupation were seen with survival period the association it was seen more age of above 40 years, male and unemployed were significantly associated with the survival period of less than 24 hours survival period. So it can be stated that more age, gender, and unemployment are the significant demographic factors for the survival period of covid victims.

In our study, the most common cause of death is hypoxia (n=355,55%), followed by ARDS (n=124,19.2%), CV failure (n=105,16.3%), Sepsis (n=11,1.7%), Septic MOF (n=14,2.2%) and other causes (n=10,1.5%).

Our study almost correlates to contou et al where he observed refractory respiratory failure was the leading cause of death. (8) There are reports which say the thrombotic complications in covid 19 patients (49 %) as cumulative incidence. (9)

It also has been noted with so many associations like increased clot strength, platelet

Fibrinogen contribution to clot strength, elevated D-dimer levels, and hyperfibrinogenemia

(10). This association may be the explanation for severe outcomes in patients with hypertension and diabetes as it was reported by peng Y-H et al, Mi Y et al. (11), (12)

Here in this study the Survival period for less than 24 hours, association with cause of death and comorbidities were seen and it was found out that persons suffering from ARDS.

In our study, the comorbidities which attributed to risk of survival are highest being Diabetes mellitus(n=298,46.1%) followed by hypertension (n=292,45.2%), Renal failure (n=92,14.2%), IHD (n=58,9%), COPD (n=27,4.2%), RA(n=3,0.5%) and least being Chemo radiotherapy(n=1,0.2%). It is noted that there is a significant association for gender, ARDS and Renal failure with period of survival after admission.

Elezkurtaj S study showed the most common comorbidity as Arterial hypertension as the most prevalent chronic condition in the decedents (65.4%), followed by obesity (38.5%), chronic ischemic heart disease (34.6%), atrial fibrillation (26.9%), and chronic obstructive pulmonary disease (23.1%). (7)

It is noted that older patients has increased comorbidities and admission with deaths rates in our study. The findings of our study was supported by Sanyaolu A. (13)

Ethical considerations

- No ethical issues are present in the present study.
- The present study will not involve any invasive procedures or interventions.
- No experimental Animals are involving in the present study
- No financial burden will be made on the study subjects and the Institute

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