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Original Research Paper

Respiratory Medicine

COMPARISON OF MORTALITY RELATED RISK FACTORS OF COVID-19 AND SARI DEATH DURING THE PEAK OF PANDEMIC IN A TERTIARY CARE CENTRE.

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ABSTRACT

Background: COVID-19 is a viral infectious disease caused by the SARS CoV-2 virus which causes severe respiratory distress in a certain number of patients with specific risk factors. This study compares the mortality risk factors of COVID 19 and Severe Acute Respiratory Infection (SARI) deaths and also determines the most likely causes that lead to such a poor prognosis

Objectives: To evaluate the risk factors of COVID 19 and SARI causing mortality. To compare the most likely risk factors that lead to such a poor prognosis

Materials And Methods: This was a Cross sectional study done on 190 patients which includes all cases of covid 19 and SARI deaths within the peak of pandemic period (August 2020). Patient datas were collected from MRD registry at Thanjavur Medical College.

Results: Among the study population of 190, age distribution of the patients died due to covid-19 was minimum 26 years to maximum 89 years and mean age of 61years. Most commonly affected were in the age around 60years. Distribution of male is around 72.1%.This study showed 47.9% were covid positive and 42.1% were suspected based on CT chest finding and clinical features. Around 84.7% were diabetic and 56.3% were hypertensive. There is no significant difference between the exposure rate of diabetes, hypertension, CKD, chronic lung disease, cerebrovascular disease, liver disease, malignancy among covid and SARI group. Among these study population 94.7% had elevated d-dimer level.

Conclusion: This study showed various comorbidities, complications, and demographic variables including diabetes, hypertension, chronic kidney disease,, chronic lung disease,liver disease, Cerebrovascular disease, cancer, increased D-dimer, male gender, older age(>50), smoking, and obesity are clinical risk factors for a fatal outcome associated with COVID 19.

KEYWORDS : COVID-19, SARI, MORTALITY, RISK FACTORS

INTRODUCTION:

2019 novel coronavirus (2019-nCoV) is a newly emerging disease that was frst reported in China, and has subsequently spread worldwide. COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which belong to the family of Betacoronavirus genus [1]. Although the clinical presentation and symptoms of COVID-19 are similar to that of Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS), the rate of spread is greater [2].

On 11 March 2019, the WHO defned COVID-19 as a pandemic disease [3], and as of February 2021, a total of 107,496,792 cases and 2,353,308 deaths (3.0%) have been confrmed worldwide in 219 countries [4]. It is a major challenge for many countries to identify what measures could be used to avoid death or severe illness. The study aims to enhance our understanding about the precision of the risk factors effect on COVID-19 and Severe Acute Respiratory Infection (SARI) fatality.

MATERIALS AND METHODS:

This was a Cross sectional study done on 190 samples which includes all cases of covid 19 and SARI deaths within the peak of pandemic period(August 2020). Patient datas were collected from MRD registry at Thanjavur Medical College.

INCLUSION CRITERIA: Both genders and all age group who were succumbed to death due to COVID 19 and SARI illness during this period.

EXCLUSION CRITERIA : Patients who were succumbed to death due to illness other than COVID and SARI. Datas collected from COVID and SARI deaths which included demographic variables ,various comorbidities, complications, including diabetes, hypertension, chronic kidney disease, liver disease, chronic lung disease, Cerebrovascular disease, malignancy, increased D-dimer, smoking obesity, duration of hospital stay. Results were analysed from SPSS trial version.

RESULTS:

Among the study population distribution of age of the patients died due to covid-19 was minimum 26 years to maximum 89 years and mean age of 61years.The Most commonly affected were in the age of 60years , 47.3% belongs to the age group of 61 to 80 years and 42.1% belongs to 41 to 60 years. Around 5.3% belongs to above 80 and less than 40 years. Among the study population distribution of male is around 72.1%(137) and female 27.9%. This study showed 47.9% were covid positive and 42.1% were suspected based on CT chest finding and clinical features.

Around 84.7% were diabetic and 56.3% were hypertensive. Around 24.7% had coronary artery disease. In this study 76.8% of study population had moderate severity in ct chest . There is a no significant difference between the exposure rate of diabetes hypertension, CKD, CLD,CVD,malignancy among covid and SARI group. Exposure of coronary artery disease among covid group higher than SARI cases and statistically significant pvalue-0.02(<0.05). Among these study population 94.7% had elevated d-dimer level. In this study there is no significant difference between covid and SARI for CT chest severity score.

Chart: 1) Frequency Distribution Of Age Grouping Of Study Population

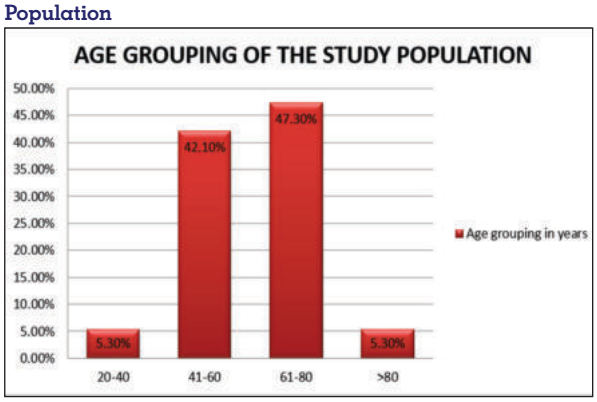


Chart: 2) Gender Distribution Of The Study Population

Among the study population distribution of male is around 72.1 % (137) and female 27.9%.

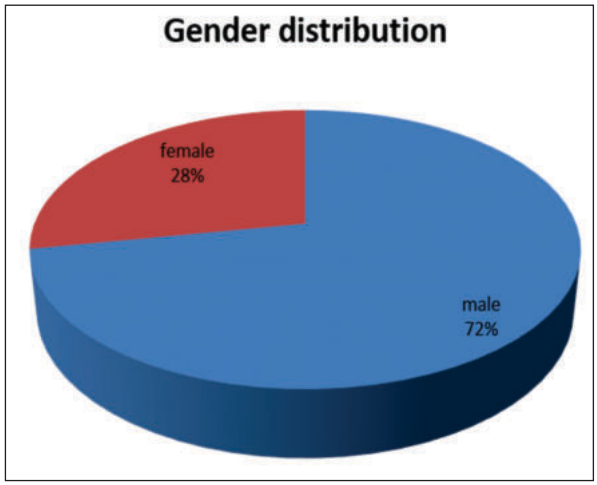


Chart: 3) Frequency Distribution Of Covid-19 Confirmed And SARI Among The Study Population.

Among the study population 47.9% were covid positive and 42.1% were belongs to suspected based on CT finding and clinical features.

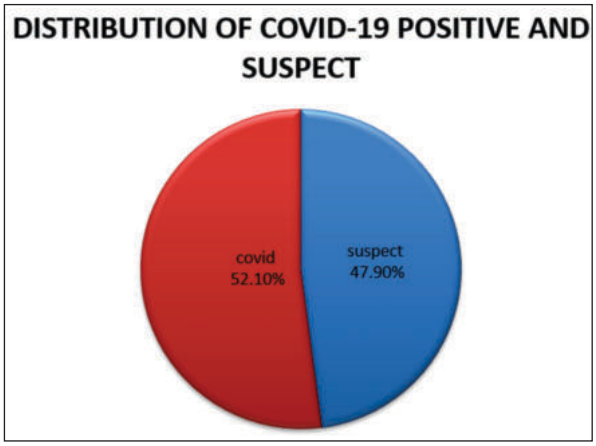


Table: 1) Frequency distribution of hospital stay among the study population

S.No	Hospital stay	Frequency	Percentage
1	1-5 days	116	61.1
2	6-10 days	69	36.3
3	11-14 days	5	2.6

Chart: 4) Frequency distribution of hospital stay among the study population

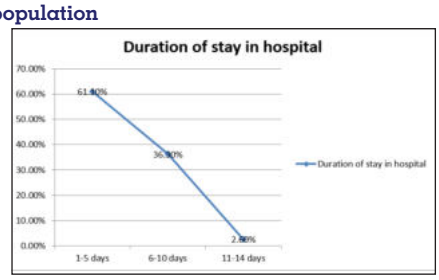


Table: 2) Frequency Distribution Of Comorbidities Among The Study Population

S.No		Frequency	Percentage
1	Diabetes	161	84.7
2	Hypertension	123	56.3
3	chronic kidney disease	34	17.9
4	Malignancy	14	6.8
5	chronic liver disease	19	10
6	coronary artery disease	54	28.4
7	cerebrovascular diseases	14	7.4
8	chronic lung disease	10	5.3

Among the study population around 84.7% were diabetic and 56.3% were hypertensive. Around 24.7% had coronary artery disease.

Chart: 5) Frequency distribution of comorbidities among the study population

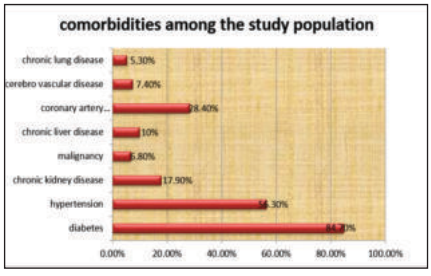


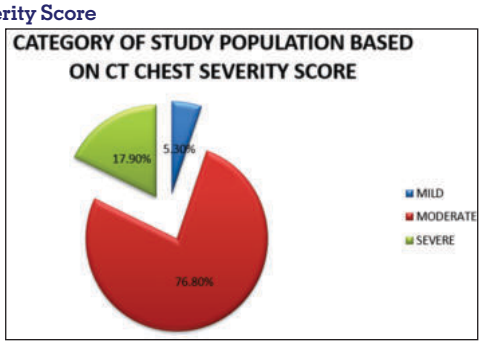
Table: 3) Frequency distribution of risk factors of comorbidities among the study population

Variables		Frequency (190)	Percentage(%)
1.smoking	Yes	104	54.7
	No	86	45.3
2.obesity	Yes	10	5.3
	No	180	94.7

Table: 4) Frequency distribution of CT CHEST COVID SCORE AND D-DIMER among the study population

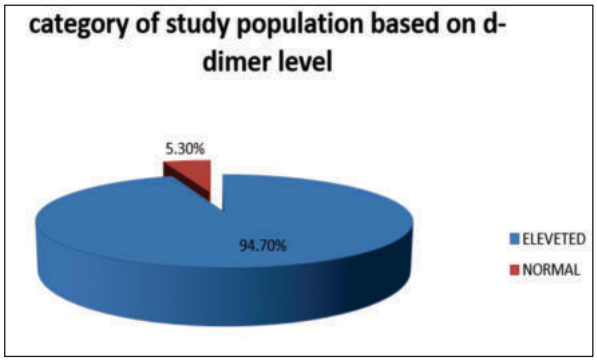
Variables	Severity	Frequency	Percentage
CT CHEST SCORE	Mild	10	5.3
	Moderate	146	76.8
	Severe	34	17.9
2.D-Dimer	Elevated	180	94.7
	Normal	10	5.3

Chart: 6) Category Of Study Population Based On Ct Chest Severity Score



In this study 76.8% of study population had moderate lung involvement

Chart: 7) Category Of Study Population Based On D-dimer Level



Among these study population 94.7% had elevated d-dimer level

Comparison Of Covid and SARI With All Comorbidities And Risk Factors

Table: 5) Comparison Of Covid And SARI With All Comorbidities And Risk Factors

	Variables	Covid	SARI	p-value	ODDS ratio
1	Diabetes	80(87.9%)	81(81.8%)	0.243	0.6(0.3-1.4)
2	Hypertension	59(64.8%)	64(64.6%)	0.97	0.9(0.5-1.7)
3	Chronic kidney disease	14(15.4%)	20(20.2%)	0.3	1.3(0.6-2.9)
4	Malignancy	7(7.1%)	6(6.1%)	0.6	0.7(0.2-2.4)
5	Liver disease	8(8.8%)	11(11.1%)	0.6	1.3(0.4-3.3)
6	Coronary artery disease	33(36.3%)	21(21.2%)	0.02	0.5(0.2-1.9)
7	Cerebro vascular disease	6(6.6%)	8(8.1%)	0.7	1.2(0.4-3.7)
8	Chronic lung disease	5(5.5%)	5(5.1%)	0.8	0.9(0.2-3.2)

Among the study population there is a no significant difference between the exposure rate of diabetes, hypertension,CKD,CLD,CVD,malignancy among covid and SARI group. Exposure of coronary artery disease among covid group higher than SARI cases and statistically significant pvalue-0.02(<0.05).

Table: 6) Comparison Of Covid and SARI With Ct Chest Score

S.No	CT SCORE	COVID	SARI	p-value	Odds ratio
1	Mild	4(4%)	6(6%)	0.73	
2	Moderate	69(76%)	77(78%)		
3	Severe	18(20%)	16(16.2%)		

In this study there is no significant difference between covid and SARI for CT chest severity score.

Table: 10) Comparison of covid and SARI with D-DIMER

S.No	D-DIMER	COVID	SARI	p-value	Odds ratio
1	Elevated	87(96%)	93(94%)	0.6	1.4(0.3-5)
2	Normal	4(4.4%)	6(6%)		

In this study there is no significant difference between covid and SARI for d-dimer level.

DISCUSSION.

Pandemic COVID-19 is causing huge morbidity and mortality throughout the world. Our study showed important risk factors associated with an increased fatality rate included older age(>60) ,male sex, smoking, baseline comorbidities especially diabetes, hypertension, chronic kidney, liver diseases, respiratory, and cardio-cerebrovascular diseases, malignancy.

Advanced age has been identified as an independent risk factor for mortality in SARS [5, 6] and MERS [7, 8]. Our study also showed that older age(>60)was also correlated with an increased mortality rate in patients with COVID and SARI.

Previous studies were primarily from China, where the proportion of adult men who smoke (>50%) is much higher than that the proportion of adult women who smoke (<3%) [9]. The sex difference in the risk of mortality among patients with COVID-19 may also be related to differential ACE2 expression in males and females related to the X chromosome [10, 11].Our study also showed increased mortality in male sex with smokers .

Our Study results showed patients with diabetes, hypertension, chronic kidney disease,liver disease, cerebrovascular disease, respiratory disease, malignancy , cardiovascular disease,obesity had approximately higher risks of mortality in both COVID and SARI patients than individuals without these conditions. Previous studies investigated the correlation of blood glucose control and outcomes in COVID-19 patients with diabetes [12]. The results indicated that patients with well-controlled blood glucose who maintain glycemic variability within 3.9 to 10.0 mmol/L had significantly improved survival compared to patients with poorly controlled blood glucose.[12] Increased D-dimer were also observed in nonsurvivors of COVID and SARI . This finding indicated that excessive activation of the coagulation cascade in progression of infection.

LIMITATION:

Clinical features and laboratory tests including lactate dehydrogenase, IL-6, and serum ferritin were not considered. Therefore, their role might be underestimated in predicting in-hospital death.

CONCLUSION:

This study showed various comorbidities, complications, and demographic variables including diabetes, hypertension, chronic kidney disease, chronic lung disease,liver disease , Cerebrovascular disease, cancer, increased D-dimer, male gender, older age, smoking, and obesity are clinical risk factors for a fatal outcome . Implementation of adequate protection and interventions for patients having comorbidities may significantly reduce the risk of mortality associated with COVID-19 and SARI.

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