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Original Research Article

Comorbidities and Delay in Seeking Treatment Association with Severity of COVID-19 Disease in Patient Mortality Due to COVID Disease at 100 Bedded Dedicated COVID MCH Hospital Raigarh, Chhattisgarh

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Abstract:

Background: A novel corona virus (SARS-CoV-2), as the causative agent of COVID-19 pandemic 2019. SARS-CoV-2 affects respiratory tract & damage the tissue results generation of inflammatory cells like cytokines and chemokines like IFN that damages the lung alveoli, causing severe acute respiratory syndrome.

Aims and Objective: To find out Association between comorbidities and delay in seeking treatment with severity of Covid-19 disease in patients died due to Covid disease at 100 bedded dedicated Covid MCH hospital Raigarh, Chhattisgarh.

Material & Methods: In this hospital based cross-sectional observational study, 187 patients with covid-19 were enrolled & categorized into three groups mild, moderate & severe. Comorbidities were determined based on patients self-report on admission. Age, sex & vital parameters, were determined and analyzed.

Results: Out of 187 patients 136 (72.72%) patients was male & 51 (27.27%) were females. The most prevalent comorbidity was diabetes mellitus (16.04%) followed by hypertension (12.29%). 52 (27.80%) patients reported having two comorbidities, hypertension associate with diabetes mellitus type II.

Conclusion: The findings of this study suggest that the presence of comorbidities is strong associated with severity of COVID-19 infection. The strongest association was observed for diabetes mellitus, and hypertension followed by AKI, CVA, anaemia, asthma & cancer.

Keywords: COVID-19, SARS-CoV-2, Comorbid conditions, diabetes mellitus, hypertension, CVA.

Introduction

In January 2020 novel coronavirus (SARS- CoV-2), identified as the causative agent of COVID- 19 disease [1]. In 30 January, 2020 World Health Organization (WHO) declared COVID- 19 disease as a public health emergency [2]. In COVID- 19 patient's activation of the humoral immune system & increase secretion of different types of interleukin is a critical mediator for respiratory failure [3]. The defective immune response causes an over production of pro-inflammatory cytokines, known as cytokine storm, that damages the lung alveoli, causing severe acute respiratory syndrome and multiple organ failure [4]. Pre-existing comorbidities affect the clinical course and outcomes of COVID-19 patients [5]. As per the latest reports clinical manifestations of COVID-19 are heterogeneous & 20–51% of patients were reported as having at least one comorbidity, with diabetes (10–20%), hypertension (10–15%) and other cardiovascular and cerebrovascular diseases (7–40%) being most common [6,7,8]. Patients with critical and severe COVID- 19 are treated in the intensive care unit (ICU), while patients with non- severe disease are hospitalized in a usual isolation room. Comorbidities like diabetes mellitus, hypertension, cancer & TB patients are more vulnerable to SARS-CoV-2 infection. The mortality of patients with comorbidities and

concomitant SARS-CoV-2 infection is higher than in the general population. Therefore, the aim of our study was to find out association between comorbidities and delay in seeking treatment with severity of Covid-19 disease in patients died due to Covid-19 disease at 100 bedded dedicated Covid MCH Hospital Raigarh, Chhattisgarh.

Aim: To find out Association between comorbidities and delay in seeking treatment with severity of Covid-19 disease in patients died due to Covid disease at 100 bedded dedicated Covid MCH hospital Raigarh, Chhattisgarh.

Objective:

1. To find out any association between comorbidities and severity of Covid- 19 disease in patients died due to Covid disease at 100 bedded dedicated Covid MCH hospital Raigarh, Chhattisgarh.
2. To find out association between delay in seeking treatment and severity of Covid-19 disease in patients died due to Covid disease at 100 bedded dedicated Covid MCH hospital Raigarh, Chhattisgarh.

Methodology :- The study was Hospital based cross sectional observational study conducted between April 2021 to August 2021 at 100 bedded dedicated Covid MCH associated Late Shri Lakhiram Agrawal Memorial Govt. Medical College Raigarh (C.G.). After obtaining the ethics approval of the Institute Ethics Committee. Detailed history age, sex, socioeconomic status & vital parameters were taken in a specified proforma of 187 patients who was admitted to ICU/HDU of dedicated Covid hospital for COVID-19, have been enrolled in the study after obtaining their written informed consent. COVID-19 disease was diagnosed in patients based on the WHO guideline by RT-PCR test. Patients' outcome in terms of mortality & recovery was noted.

Statistical analysis: The data were collected & compiled on Microsoft Excel Software and presented in the form of mean, percentages, odds ratio and figures such as tables. Data were analyzed using SPSS software 29 version. Correlation between comorbidities & clinical outcome of covid-19 patients were analyzed by Chi-square test. The p value of <0.05 was considered as a statistically significant.

Results: A total 187 COVID-19 patients were included in this study. Out of 187 COVID-19 cases 139 patients were normal, 16 patients was mild, 08 patients was moderate, 24 patients was severe form of Covid-19 disease admitted in 100 Bedded Dedicate Covid hospital MCH Raigarh.

Table 1: Severity of Covid-19 disease with age of the patients died due to Covid-19.

Age	SpO2									
	Normal	%	Mild	%	Moderate	%	Severe	%	total	%
<10	2	1.06	0	0	1	0.53	0	0	3	1.60
11 to 20	0	0	0	0	0	0	1	0.53	1	0.53
21 to 30	7	3.74	1	0.53	1	0.53	1	0.53	10	5.34
31 to 40	11	5.88	1	0.53	0	0	6	3.20	18	9.62
41 to 60	56	29.94	4	2.13	3	1.59	7	3.73	70	37.42
≥ 61	63	33.66	10	5.34	3	1.59	9	4.79	85	45.43
Total	139	12.83	16	4.27	08	8.55	24	74.33	187	100

(Chi Square: 24.40, DF: 15, P =0.048)

In table-1 shows that Severity of Covid-19 disease with age of the Covid-19 patients. 03(1.60%) patients was below 10 yrs. of age, 01(0.53%) patient's was 11 - 20 yrs. of age, 10(5.34%) 21-30 yrs. of age, 18(9.62%) 31-40 yrs. of age, 70(37.43%) 41-60 yrs. of age & 85(45.45%) patients were above 61yrs. of age. Severity of Covid-19 disease was found to be associated to the age of the patient died due to Covid p<0.05. Nine (9) death 4.79% was seen among 61 and higher age group with severe Covid-19 disease and increasing trend was observed from lower to higher age group. Over all death was also seen in higher age groups with increasing trend.

Table 2: Association of Gender with Severity of Covid-19 disease

SpO2	Gender					
	Male	%	Female	%	Total	%
Normal	15	8.02	9	4.81	24	12.83
Mild	7	3.74	1	0.53	8	4.278
Moderate	13	6.95	3	1.60	16	8.55
Severe	101	54.01	38	20.32	139	74.33
Total	136	72.72	51	27.27	187	100

(Chi Square: 2.7321, DF: 3, P = 0.4348)

In table-2 shows that Association of Gender with Severity of Covid-19 disease. Out of 187 patient's 136(72.72%) patient's was male & 51(27.27%) were female.

Table 3: Association of severity of disease with delay in seeking treatment for Covid-19 patents died due to Covid-19 disease

	Delay in seeking treatment after development of symptoms					
SpO2	**≤ 4 days**	**%**	**≥ 5 days**	**%**	**Total**	**%**
Normal	13	6.95	11	5.88	24	12.83
Mild	5	2.67	3	1.60	8	4.27
Moderate	9	4.81	7	3.74	16	8.55
Severe	66	35.29	73	39.03	139	74.33
Total	93	49.73	94	50.26	187	100

(Chi Square: 1.2639, F: 3, P = 0.7377)

In table-3 association of severity of disease with delay in seeking treatment for Covid-19in patents died due to Covid-19 disease. Not much difference was seen in delay in seeking treatment and severity of Covid-19 disease were patients seeking treatment within 4 days or less were 49.73% with 35.29% severe disease and patients seeking treatment within 5 day or more were 50.26% in total with 39.03% severe disease.

Table 4: Association of comorbidities with severity of Covid-19 disease in patients died due to Covid-19 disease

Comorbidities	**SpO2 (Oxygen saturation level)**									
	Normal	**%**	**Mild**	**%**	**Moderate**	**%**	**Severe**	**%**	**Total**	**%**
AKI	2	1.06	1	0.53	0	0	9	4.81	12	6.41
CKD	1	0.53	0	0	1	0.53	0	0	2	1.06
DM II	1	0.53	2	1.06	2	1.06	25	13.36	30	16.04
HTN	1	0.53	0	0	3	1.60	19	10.16	23	12.29
DM II+HTN	6	3.20	2	1.06	7	3.74	37	19.78	52	27.80
Anaemia	1	0.53	0	0	0	0	7	3.74	8	4.27
Asthma	0	0	0	0	1	0.53	2	1.06	3	1.60
Cancer	0	0	0	0	0	0	2	1.06	2	1.06
CVA	4	2.13	1	0.53	1	0.53	4	2.13	10	5.34
Cardiac disease	2	1.06	1	0.53	0	0	1	0.53	4	2.13
CLD	2	1.06	0	0	0	0	0	0	0	1.06
PNC with eclampsia	2	1.06	0	0	0	0	0	0	0	1.06
Others	17	9.09	12	6.41	8	4.27	4	2.13	41	21.92
total	39	20.8 5	19	10.16	23	12.29	110	58.82	187	100

(Chi Square: 37.33, F: 27, P = 0.00290)

In table-4 shows that association of comorbidities with severity of Covid-19 disease in patients died due to Covid-19 disease. Out of 187 Covid-19 patients 12(6.41%), 02(1.06%), 30(16.04%), 23(12.29%), 08(4.27%), 03 (1.60%), 02(1.06%), 10(5.34%), 4(2.13%), 2(1.06%), 2(1.06%) patients reported having AKI, chronic kidney diseases, diabetes mellitus II, Hypertension, Anaemia, asthma, malignancy, CVA, cardiovascular diseases, chronic liver disease, eclampsia respectively.

Severity of disease had been found strongly associated with Covid-19 disease $p<0.05$ ($p=0.00290$) were 58.82% had severe disease with some or more combine comorbidities. Highest seen for Diabetes associated with Hypertension (DM II +HTN) 27.80% with severe disease 19.78% highest among all comorbidities related death.

Followed by Diabetes alone 16.4% then hypertension 12.29%. Acute kidney injury (AKI) had also been associated with death with 4th most common comorbidity related death due to Covid 19 disease 6.41%. CVA 5.34%, Anemia 4.27%, Cardiac disease 2.13%. Comorbidity like diabetes mellitus associated with hypertension was seen more commonly in severe group than in mild (19.78% versus 1.06%) & moderate (19.78% versus 3.74%) group.

Discussion

This study provided the Comorbidities and delay in seeking treatment association with severity of Covid-19 disease. Multiple comorbidities are associated with the severity of COVID-19 disease. In a cohort study of 7337 patients with COVID-19 with and without type 2 diabetes patients it was shown that increased mortality rate in type II diabetes patients as compared than non-diabetic patients, in this study also Patients with type 2 diabetes mellitus patients have increased severity &

poor outcome associated with COVID-19 [9]. Poor outcomes for COVID-19 have been related to cardiovascular comorbid conditions in this study also increase mortality was seen in cardiovascular disease after type II diabetes mellitus [10]. Ejaj H. et al Covid-19 & comorbidities deleterious impact on infected patients mortality rate of COVID-19 patients with comorbidities study found in china HTN (9.5%) DM (7.4%) CVD (7.3%), liver disease (2.4%), renal disease (0.7%), malignancy (2%) & in this study type II DM (16.04%), HTN (12.29%), CKD (1.06%), chronic liver disease (1.06%) & malignancy (1.06 %.) [11].

Conclusion: The findings indicate that the presence of associated comorbidities is associated with worse outcome in COVID-19 infection. Cerebrovascular disease was the most strongly predictive comorbidity for severe disease, followed by CVD, chronic lung disease, cancer, diabetes, and hypertension. Among laboratory-confirmed cases of Covid-19, patients with any comorbidity yielded poorer clinical outcomes than those without. A greater number of comorbidities also correlated with poorer clinical outcomes. A thorough assessment of comorbidities may help establish risk stratification of patients with Covid-19 upon hospital admission.

Ethical approval: The study was approved by the Institutional ethical committee of Late Shri Lakhiram Agrawal Memorial Govt. Medical College Raigarh (C.G.)

Work Attributed to: 100 Bed Dedicated Covid MCH Associated Late Shri Lakhiram, Agrawal Memorial Govt. Medical College Raigarh (C.G.), INDIA

Author contributions: LKS- conceptualization the article; **VPG-** contributed study design & data collection; **VS-** data analysis & interpretation of results; **HK-** manuscript preparation; **SKM-** review & editing; **AMM**- review & final correction. All authors read & approved the final manuscript.

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