ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 12, Issue, 06, pp.11914-11918, June, 2020

DOI: https://doi.org/10.24941/ijcr.38902.06.2020

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

EPIDEMIOLOGY, CLINICAL PROFILE AND OUTCOME OF COVID-19 PATIENTS ADMITTED IN DEDICATED COVID HOSPITAL IN SOUTHERN RAJASTHAN

Dr. Mahesh Dave[1], Dr. Mayank Sharma[1*], Dr. Lakhan Poswal[1], Dr. VikramBedi[1], Dr. Narendra Deval[2] and Dr. Rahul Vijayvargiya[2]**

[1]Senior Professor, Department of Medicine and Anesthesia, RNT Medical College Udaipur, Rajasthan, India
[1*]Senior Resident Department of Medicine, RNT Medical College Udaipur, Rajasthan, India
[1**] Principal and Controller, Dedicated Covid Hospital, RNT Medical College Udaipur, Rajasthan, India
[2] Senior Resident, Department of Anesthesia and Medicine, RNT Medical College Udaipur, Rajasthan, India

ARTICLE INFO

Article History:
Received 20th March, 2020
Received in revised form
09h April, 2020
Accepted 17th May, 2020
Published online 29th June, 2020

Key Words:

Covid-19,MODS in
Covid-19,ARDS

ABSTRACT

Background: The entire world is struggling with novel corona virus (Covid-19) and pandemic is still not under control.The aim of our study is to understand various epidemiological factors, clinical presentation and outcome of Covid-19 patients, who were admitted in Dedicated Covid Hospital, attached to RNT Medical college Udaipur Rajasthan. **Methods:** This was a prospective, observational study conducted over 224 ,RT-PCR confirmed Covid-19 patients, over a period of one month from 1st May 2020 to 31st May 2020. Epidemiological, clinical, laboratory and radiological data were collected and analysed of all these patients. **Results and Discussion:** We observed that Covid-19 virus affects all age group but the most commonly affected patients were younger adult of 16-49 year age. Most of the patients were male (58.10%), residing in urban area (74.10%) and were from middle socioeconomic class (75%). Most of patients were asymptomatic (73.66%),Among symptomatic most common symptoms was cough (81.35%)&fever (59.33%).Approximately 30.35%had comorbidities and most common comorbidities was hypertension (17.85%). Leukopenia, lymphopenia, thrombocytopenia along with altered LFT was observed as most common laboratory finding. The most common complication observed was ARDS and kidney injury, outcome was observed good and case fatality rate was 2.23%. **Conclusion:** From present study we conclude that it affects younger adult, male, from urban area and middle socioeconomic class people. Most common symptoms were cough & fever and common complications were ARDS, kidney injury, MODS & myocarditis.

Citation: ***Dr. Mahesh Dave, Dr. Mayank Sharma, Dr. Lakhan Poswal, Dr. Vikram Bedi, Dr. Narendra Deval and Dr. Rahul Vijayvargiya2,*** **2020.** "Epidemiology, clinical profile and outcome of covid-19 patients admitted in dedicated covid hospital in southern Rajasthan, *International Journal of Current Research*, 12, (06), 11914-11918.

INTRODUCTION

Emerging and re-emerging pathogen are global challenge for public health (George, 2018). In Dec 2019, a new contagious COVID-19 pneumonia caused by a novel corona virus (SARS COV-2) immersed in Wuhan, Hubei, China (Imperial College London) and spread very rapidly all over the world both in developing and developed countries such as USA, Italy, Spain, UK as well in India. The ongoing COVID-19 pandemic is currently not under control. Corona virus is an enveloped, positive sense single strand RNA virus that broadly affects human, other mammals and birds and causing respiratory, enteric, hepatic and neurological diseases in them (Weiss, 2011; Masters, 2013).

Corresponding author: **Dr. Mayank Sharma,**
Senior Resident Department of Medicine, RNT Medical College Udaipur, Rajasthan, India

Coronavirus have the largest genome among all RNA viruses, typically ranging from 27 to 32 kb. The genome is packed inside a helical capsid formed by the nucleocapsid protein (N) and further surrounded by an envelope. Viralenvelope contains at least 3 structure proteins, membrane protein (M),envelope protein (E) and spike protein(S). The spike forms large protrusions from the virus surface, giving the appearance of having crowns (hence there name;corona in Latin means crown) (Walls, 2016; Beniac, 2006). Six Corona virus species are known to cause human diseases. Four virus-229E, OC43, NL63 and HKU1 are prevalent and typically cause common cold symptoms in immunocompetent individuals[7]. Two other strains-severe acute respiratory syndrome corona virus (SARS-CoV) and Middle East respiratory syndrome corona virus (MERS-CoV) are zoonotic in origin and have been linked to sometime fatal illness (Cui, 2019). SARS-CoV was the pathogen responsible for severe respiratory syndrome outbreaks in 2002 and 2003 in Guangdong Province, China

(Zhong, 2003; Ksiazek, 2003; Zaki, 2013). MERS-CoV was the pathogen responsible for severe respiratory disease outbreaks in 2012 in the middle east[11]. By January 2020, Chinese scientist had isolated a Novel Corona virus (SARS COV-2) from the patient of pneumonia of unknown cause (Phelan, 2020; Gorbalenya, 2020). It was latter designated Corona Virus Disease-2019 (COVID-19) in February 2020 by WHO[15].This disease is primarily transmitted human to human via droplets as well as contact with fomites (Guan, 2020). Around 59,34,936 laboratory confirmed cases of COVID-19 and 3,67,166 confirmed death have been reported in all over world as on 31st May 2020. India has reported 1,82,143 cases and 5,164 death of COVID-19 till 31st May 2020 (Coronavirus disease, 2020).

The clinical spectrum of SARS- CoV2 infection appears to be wide, and variable encompassing asymptomatic infection, mild upper respiratory tract illness like mild fever ,throat pain, myalgia, cough and severe viral infection like atypical pneumonia, acute respiratory distress syndrome(ARDS), cardiac symptoms like hypotension, myocarditis, renal involvement inform acute kidney injury(AKI) and multiple organ dysfunction syndrome(MODS) and even deaths. There is variability in clinical presentation, severity of disease, prognosis and outcome of Covid-19 disease . It varies country to country, state to state and city to city. A lot of factors was postulated for this variability which may include age, viral strain, innate immunity, environmental factors and comorbidities among the affected population. Hence a prospective study was planned over laboratory confirmed Covid-19 patients who were admitted in dedicated Covid hospital, a tertiary care hospital of southern Rajasthan with aim and objective to study various epidemiological factors, clinical presentation and outcome of these patients.

MATERIAL AND METHODS

This was prospective, observational study conducted over 224 RT-PCR confirmed Covid-19 patients admitted in Dedicated Covid Hospital, a tertiary care centre, attached to RNT Medical college Udaipur Rajasthan, over a period of one month from 1st May 2020 to 31st May 2020. *Inclusion criteria:* All RT-PCR confirmed Covid-19 patients admitted in various wards of dedicated Covid hospital, irrespective of age and gender. *Exclusion criteria*: Patients who didn't give written consent for study.

Methodology:

Patients who were suspected to be Covid-19 infection on the basis of clinical history, contact history and travel history as per ICMR guideline, underwent RT-PCR testing of oropharyngeal/nasopharyngeal swab for Covid-19. These RT-PCR confirmed covid-19 patients were admitted in Covid hospital and were enrolled in the present study after written consent. All Covid-19 patients epidemiological data (age, gender, residence, profession, socioeconomic status, smoking habits), clinical data (fever, cough, shortness of breath, myalgia, sore throat, headache, hemoptysis, diarrhea, hypotension, hypoxia) and comorbidities were recorded. BJ Prasad scale was used for socioeconomic description. All these patients were followed upover a period of hospital stay and complications were recorded inform cardiac involvement (myocarditis), renal involvement (AKI and CKD), ARDS and multiple organ dysfunction syndrome (MODS).

Following were the criteria taken to diagnose complication of covid-19 patients.

Cardiac involvement (myocarditis)

- History of acute onset pain chest suggestive of cardiac origin
- Acute onset ECG changes in form tachycardia / bradycardia, interventicular conduction defects(IVCD), and secondary ST – T wave changes
- Elevated cardiac biomarkers (CPK-MB/ TROP-I)

Acute respiratory distress syndrome (ARDS) – Berlin 2017 criteria were taken

- onset of illness less than week
- bilateral opacity in chest X-ray which are not due to cardiac failure or fluid overload
- $PaO_2/FiO_2 < 300$

Multiple organ dysfunction syndrome (MODS) - 2 or more than 2 organ involvement

Renal involvement (AKI/CKD)

1. Raised urea and serum creatinine above the normal value (serum urea >40 mg/dl and serum creatinine>1.3 mg/dl). All these patients were investigated with a set protocol of investigation which includes complete blood count (CBC), fasting blood glucose (FBG), renal function test (serumurea & creatinine), liver function test (SGOT, SGPT, serum bilirubin and alkaline phosphatase) as, C reactive protein (CRP), erythrocytesedimentation rate (ESR), lactate dehydrogenase (LDH), creatine kinase-MB (CK-MB) , arterial blood gas analysis (ABG) ,chest x-ray and ECG. Serum Trop I was measured in all patients where cardiac illness was suspected. Patients outcome was recorded in terms of discharged or death.

RESULTS

The present study was conducted over 224 RT-PCR confirmed COVID-19 patients admitted in various wards in Dedicated Covid Hospital, Udaipur a Tertiary Care Centre at Southern Rajasthan. Out of 224 patients studied the most common age group was 16-49 years (66.07%) followed by 50-64 year age group(19.19%). Regarding the gender male were predominantly involved(56.25%).More than half patients were from urban area (74.10%) and belonged to middle socioeconomic class(75%).

Majority of patients had history of contact to laboratory confirmed Covid -19 cases (80.35%),where as 18.75% had history of travelling to infected regions.42.80% were smoker in present study group. The clinical profile are shown in table 2. Out of 224 patients studied 165 patients (73.66%) were asymptomatic while 59 patients (26.33%) were symptomatic. Among symptoms cough were in (81.35%), fever were (59.33%), myalgia were (50.84%), shortness of breath were (49.15%) and sore throat were in (47.45%). Few patients had headache (22.03%), diarrhea (18.64%) and hemoptysis (01.69%). 68 patients (30.35%), out of total patient studied (n=224) had comorbidities.

Table 1. Epidemiological profile of COVID-19 patients

S.No.	Characteristics	Patients (n=224)	(%)
1.	Age		
	0-15 years	10	04.46
	16-49 years	148	66.07
	50-64 years	43	19.19
	>65 years	23	10.26
2.	Gender		
	Male	126	56.25
	Female	98	43.75
3.	Residence:		
	Rural	58	25.89
	Urban	166	74.10
4.	Profession		
	Health care worker	12	05.35
	Others (businessmen, student, agriculture)	212	94.65
5.	Socioeconomic status:		
	Upper class	40	17.85
	Upper middle class	34	15.17
	Middle class	82	36.60
	Lower middle class	52	23.21
	Lower class	16	07.14
6.	H/O Travelling to infected region	42	18.75
7.	H/O Contact to laboratory confirmed case	180	80.35
8.	Smoker (yes)	96	42.85

Table 2. Clinical profile of COVID-19 patients

S.No.	Characteristics	All patients (n=224)	%
1	Sign and symptoms		
	Asymptomatic	165	73.66
	Symptomatic	59	26.33
	- Fever	35	59.33
	- Cough	48	81.35
	- Myalgia	30	50.84
	- Sputum production	10	16.94
	- Shortness of breath	29	49.15
	- Sore throat	28	47.45
	- Headache	13	22.03
	-Chest pain	08	03.57
	- Diarrhea	11	18.64
	- Hemoptysis	01	01.69
	-Hypotention	08	03.57
	- Hypoxia	38	64.40
2	Comorbidity		
	No of pts with comorbidity	68	30.35
3	Type of comorbidity		
	Hypertension	40	17.85
	DM	28	12.50
	CVD	20	08.90
	COPD	38	16.96
	Hypothyroidism	12	05.35
	CKD	07	03.12
	Malignancy	03	01.30

And among comobidities hypertension (17.85%), chronic obstructive lung disease (16.96%), diabetes mellitus (12.50%), cardiovascular disease (08.90%), hypothyroidism (5.35%), chronic kidney disease (3.12%) and malignancy (1.30%) were observed. The above table 3 showing laboratory investigation in studied population. CBC revealed leukocytosis (WBC>10000/µL) in 14 patients (6.25%), leucopenia (WBC<4000/µL) in 47 patients (20.98%), lymphopenia (ALC<1500/µL) in 27 patients (12.05%) and thrombocytopenia (platelet count <1,50000/µL) in 32 patients(14.28%). 22 patients (09.80%) had impaired RFT,11 patients(6.69%) had raised total bilirubin,38 patients(16.96%) had raised AST and 21 patients(9.37%) had raised ALT where as 92 patients(41.07%) had elevated alkaline phosphatase. Elevated serum CRP, ESR, LDH and CKMB was present sequentially in 146 patients (65.17%), 183 patients (82%), 203 patients (91%) and 209 patients (93.60%). Serum Trop I was raised in 8 patients (03.50%). Out of 224 patients studied, complication were observed in 24 patients (10.71%) . among complication ARDS was observed in 22 patients (9.80%), Multiple Organ Dysfunction Syndrome (MODS) in 15 patients (06.69%) myocarditis in 8 patients (03.57%), ARDS and myocarditis both in 6 patients (02.60%) and AKI/CKD in22 patient (09.80%). Total 96 patients (42.80%) had atypical pneumonia in chest roentgenogram, among them only 29 pateints (30.20%) were symptomatic where as measure 67 patients (69.79%) were asymptomatic. Silent hypoxia was observed in 6 patient (02.67%) out of total studied patient (n=224). Outcome of patients is shown in table 5. 219 patients (97.76%) of total were discharged and 5 patients (02.23%) died.

DISCUSSION

The present study was conducted over 224 RT-PCR confirmed Covid-19 patients .It was observed that Covid 19 infection occurred in the all age group ranging from infant to elderly. In the present study the youngest Covid-19 patient was a infant of 10 months of age whereas oldest was of 82 years of age. In the present study maximum patient were seen in young adult 16 to 49 year age group followed by 50 to 64year age group and found 66.06% and 19.19% respectively .This high rate of infectivity in young population may be due to the fact of high priority of travelling in this age group.in the present study more than half of the patients were male (56.25%) and such a type of male preponderance was also reported by many of the authors. Wei-jie *et al* and Bhandari *et al* reported similar male preponderance in 58.10% and 66.66% respectively (Wei-jie, 2019; Bhadari, 2020). The most of the patients were from urban population (74.10%) and from middle socioeconomic class (75%).

Regarding the profession very few patients were health care worker (5.35%) where rest was from variable profession such as agriculture, business, student and other profession. Clinical spectrum of Covid 19 patients is wide and variable ranging from asymptomatic to critical illness. In the present study the most of patients were asymptomatic (73.66%), which was contradict with the study done by Nitesh Gupta*et al*. where 42.9% patients were asymptomatic (Nitesh Gupta, 2020). Among symptomatic patients (59 patients) most common symptoms reported was cough (81.35%), fever (59.33%), myalgia (50.84%) and shortness of breath (49.15%), Bhandari *et al* observed similar type of finding where cough was major clinical feature followed by fever, but the study done by Wang *et al* reported fever as the most common symptom. This variation between different studies may be explained by the fact that covid 19 disease may present differently and varies country to country and region to region. In the present study over 224 patients, 68 patients (30.35%) had comorbidities and among comorbiditiesl hypertension was observed in maximum patients (17.85%) followed by chronic obstructive lung disease (16.96%), diabetes mellitus (12.50%), cardiovascular disease (08.90%), hypothyroidism (5.35%), chronic kidney disease (3.12%) and malignancy (1.30%). The studied population (n-224) underwent all routine investigation and found leukocytosis in 06.25%, leukopenia in 20.98%, lymphopenia in 12.50% and thrombocytopenia in 14.28% patients. Bhandari *et al* and Zhang *et al* reported higher incidences of lymphopenia

Table 3. Laboratory and radiological features of COVID-19 patients

S. No.	Investigation	Value	Patients (n=224)	%
	White blood count	>10000/ µL	14	06.25
		< 4000/ µL	47	20.98
2	Absolute lymphocyte count	<1500/ µL	27	12.05
3	Platelet count	>1,50000/ µL	32	14.28
4	S. Creatinine	>1.3 mg/dl	22	09.82
5	Liver Function Test		132	58.92
	Total bilirubin	>1 mg/dl	11	04.91
	Alakaline phosphatase	>116IU/L	92	41.07
	AST	>37 U/L	38	16.96
	ALT	>63 U/L	21	09.37
6	S. CRP	>3 mg/l	146	65.71
7	ESR	>20 mm/hr	183	82.00
8	S. LDH	>234 U/L	203	91.00
9	Raised CKMB	>25 U/L	209	93.60
10	Raised Trop I	>0.014 ng/ml	08	03.50
11	Atypical pneumonia in chest X-Ray		96	42.80

Table 4. Complications in COVID-19 patients

S.No.	Complications	Patients n=224	%
A.	Complications		
1.	ARDS	22	09.80
2.	Myocarditis	08	03.57
3.	ARDS & Myocarditis both	06	02.60
4.	AKI/ CKD	22	09.80
5.	MODS	15	06.69
B.	Other complications		
1.	Asymptomatic pneumonia	67	29.90
2.	Silent hypoxia	06	02.67

Table 5. Outcome of Covid 19 patients

Total patients	Discharged		Death	
	Patients	%	Patients	%
224	219	97.76	5	02.23

52.38% and 75.4% in similar type of study. These results are higher than present study and the variation may be explained by the fact that the presentation and severity of patient population is variable as in present study maximum patient were from asymptomatic group. Serum creatinine was raised in 22 patients (09.80%) whereas LFT was deranged in 132 patients (58.92%), out of LFT the most common liver enzyme affected was Alk. Phosphatase followed by SGPT in 41.07% and 09.37% respectively. Most of patients had raised serum CRP (65.17%), ESR (82%), LDH (91%) and CKMB (93.60%) but Trop I was found significantly high only in 8 patients (03.50%).

There were a gross difference in CPKMB and Trop I level in covid 19 patients and there is no correlation seen between these two cardiac biomarkers. In the present study 96 patients (42.80%) had atypical pneumonia in chest roentgenogram out of them 67 patients (69.79%) were asymptomatic whereas only 29 patients (30.24%) were symptomatic. Only 06 patients (02.67%) had silent hypoxia. Similar type of silent hypoxia was also reported by William Ottestad *et al*. In the present study 24 patients (10.71%) developed complication and the most common complication observed was ARDS and kidney injury in 09.80% followed by MODS in 06.69%, myocarditis in 03.75% patients. Out of these 24 patients developed complications 19 patients survived where rest 5 of them died. The present study carried over 224 patients, the outcome was observed and was favourable in the form of discharge (97.76%) whereas case fatality rate was 02.23%.

Conclusion

The present study which was carried over 224 RT-PCR confirmed Covid-19 patients admitted in Dedicated Covid Hospital , a tertiary care hospital of southern Rajasthan ,over a period of one month. We concludes that most of our patients were from young adult population with male and urban preponderance. Maximum of them were from middle socioeconomic status and very few of them were from health care worker profession. Most of the Covid-19 patients were from asymptomatic group where among symptomatic group most common symptoms were respiratory symptoms like cough, shortness of breath and fever. Co morbidities was observed in significant number of patients and the most common co morbidity was hypertension and COPD. Leukopenia, lymphopenia, thrombocytopenia, elevated Alk. Phosphatase, high ESR, CRP, LDH and CPKMB were the common laboratory abnormal finding observed in these patients. The most common radiological finding on x-Ray chest was atypical pneumonia but even maximum patients was not symptomatic. The common complication among this study was ARDS, kidney injury, myocarditis and MODS and they are major cause of death in the present study.

REFERENCES

Beniac DR, Andonov A *et al*. 2006. Architecture of the SARS coronavirus prefusion spike. *Nat Struct Mol Biol.,* 13:751–52

Bhadarietal. Clinical profile pfCovid 19 infected patients admitted in a tertiary care hospital in North India.JAPI May volume 68:13-17.

Chan JMW,Ng CK *et al*. Short term outcome and risk factor for adverse clinical outcomes in adult with severe acute respiratory syndrome (SARS). Thorax.2003;58:686-689.

Coronavirusdisease (COVID 19)situation report.https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/

Cui J, Li F *et al*., 2019. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol*., 17:181-192.

George F. Gao. 2018. From "A"IV to "Z"IKV: attacks from emerging and re-emerging pathogens. Cell 172:1157-1159.

Gorbalenya AE., Baker SC. *et al*. 2020. Severe acute respiratory syndrome-related coronavirus: the species and its viruses—a statement of the Coronavirus Study Group.bioRxiv. (published online Feb 11.) (preprint).DOI:10.1101/2020.02.07.937862

Guan W, Ni Z *et al*. Clinical characteristics of corona virus disease 2019 in China. N Engl J Med 2020.382:1708-1720

Imperial College London. Report 2: estimating the potential

Jan 2020. https://www.imperial.ac.uk/mrc-global infectiousdisease-analysis/news--wuhan-coronavirus.

Ksiazek TG, Erdman D *et al*. 2003. A novel coronavirus associated with severe acute respiratory syndrome. *N Engl J Med.,* 348:1953-1966

Masters PS, Perlman S *et al*. 2013. Coronaviridae. In: Knipe DM, Howley PM, eds. Fields virology. 6th ed. Lippincott Williams & Wilkins, 825-58.

Nitesh Gupta *et al*. Clinical and epidemiologic profile of the initial COVID 19 patients at a tertiary care centre in India.Monaldi Archives for Chest Disease 2020;volume 90:1294.193-196

Phelan AL, Katz R. *et al*., 2020. The novel coronavirus originating in Wuhan, China: challenges for global health governance. JAMA 323(8)709-710. (published online Jan 30.) DOI:10.1001/jama.2020.1097

PMID: 32378842 DOI: 10.4045/tidsskr.20.0299

Su S, Wong G. *et al*., 2016. Epidemiology,genetic recombination and pathogenesis of coronaviruses. *Trends Microbiol.,* 24:490-502

total number of novel coronavirus cases in Wuhan City, China.

Walls AC, Tortorici M *et al*., 2016. Cryo-electron microscopy structure of a coronavirus spike glycoprotein trimer. Nature., 531:114–17.

Wei-jie, Ph.D *et al*. 2020. Clinical charcteristics of coronavirus disease 2019 in China.NEngl Med 2020;382:1708-1720.

Weiss SR, Leibowitz JL *et al*., 2011. Coronavirus pathogenesis. *Adv Virus Res.,* 81:85-164.

William *et al*. COVID-19 With Silent Hypoxemia.

Zaki AM *et al*. 2012. Isolation of novel coronavirus from a manwith pneumonia in Saudi Arabia. *N Engl J Med.*, 367:1814-1820

Zhang J *et al*. 2020. Clinical characteristics of 140 patients infected with SARS-CoV in Wuhan, China. European Journal of Allergy and Clinical Immunology 00:1-12.(published 19th February,2020).

Zhong NS *et al*., 2003. Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republication of China, in February, 2003.Lancet. 362:1353-1358.

****