Original Research Article

A study of initial 251 Covid-19 patients admitted at Government Medical College, Kota

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ABSTRACT

Background: A new strain of Corona virus, presently known as Covid-19, belongs to the family of Corona viruses that originated in animals, has not previously been identified in humans. The high infectivity of the disease led to the third Corona virus outbreak in the last 20 years after the SARS-CoV and the Middle East respiratory syndrome MERS-CoV.

Methods: It was a hospital based descriptive cross-sectional study at Government Medical College (GMC), Kota Hospital, conducted from 5 April to 10 May 2020. All the positive patients who were residents of Kota and diagnosed and admitted at GMC, Kota were selected for this study. A pretested and structured questionnaire was used. Data were entered, processed and analyzed using SPSS version 20.

Results: Out of total 251 included patients, 162 Males and 89 Females. The most affected containment zones were Chandraghata, Suket, Bhimganjmandi and Anantpura. The mass sampling was satisfactory in Chandraghata, Bhimganjmandi and Anantpura. Seventy one percent of first follow up sample were negative which increased on subsequent follow up sample. Only 10 Patients died with the case fatality rate of 03.98%. Twenty five patients became follow up positive even after their first follow up sample was negative.

Conclusions: Males were more affected then females. Maximum number of cases belonged to 20-50 years of age. Sampling pattern was not uniform. The results do not justify labelling to the asymptomatic/mild Covid-19 positive patient as cured just after the first follow up negative. Most common co-morbidities in fatal Covid-19 patients were diabetes mellitus, hypertension and chronic obstructive pulmonary disease.

Keywords: Corona virus, SARS, MERS, Asymptomatic, Cured

INTRODUCTION

Corona viruses are a family of viruses that originate in animals before making the jump to humans. Corona virus includes around a dozen types of virus particle that are associated with very different disease states of which Seven, including the new virus, have been found in humans, with four causing only mild, common cold-like symptoms.[1]

Corona virus, presently known also as Covid-19, is understood to be a new strain that has not previously been identified in humans, first popped up in Wuhan (China) in the people who had visited local seafood and animal market.

The second meeting of the emergency committee was convened by the WHO director general under the International Health Regulations (IHR) (2005) regarding the outbreak of novel Corona virus 2019 on Thursday

30 January 2020. It was decided to declare this disease as a Public Health Emergency of International Concern (PHEIC) with the guidelines to all countries preparing them for containment, including active surveillance, early detection, isolation and case management, contact tracing and prevention of onward spread of 2019-nCoV infection.[2] The high infectivity of the disease led many governments to adopt strict regulations and measures with the aim of containing its spread. This pandemic is the third Corona virus outbreak in the last 20 years after the SARS-CoV and the Middle East respiratory syndrome MERS-CoV.[3]

International Committee on Taxonomy of Viruses (ICTV) announced "severe acute respiratory syndrome Corona virus 2 (SARS-CoV-2)" as the name of the new virus on 11 February 2020. This name was chosen because the virus is genetically related to the Corona virus responsible for the SARS outbreak of 2003. As agreed by the ICTV, WHO announced "COVID-19" as the name of this new disease on 11 February 2020 to avoid a risk associated with fear and miscommunications using the name SARS.[4]

The incubation period is up to 14 days but in some cases, it can be outside this range. Most people get infected with Corona viruses at one point in their lives, but symptoms are typically mild to moderate. In some cases, the viruses can cause lower-respiratory tract illnesses such as pneumonia and bronchitis. According to the WHO, the new Corona virus causes a fever, fatigue, sore throat and dry cough in the early stages of the disease. As the illness progresses, patients may experience difficulty breathing.

Human corona virus diseases are usually said to be zoonotic viral diseases. The primary mode of transmission seems to be from animal to human. According to CDC, the human corona virus are most commonly spread between an infected person and others via - droplet transmission, close personal contact, contact with an object or surface with viral particles on it, and rarely from fecal contamination, hospitals are also key locations for 'super spreading' events - when a single patient infects many people.

Diagnosis of infection with 2019-nCoV is by finding evidence of the virus in respiratory samples. Real time polymerase chain reaction (RT-PCR) assays are designed to detect 2019-nCoV sequences. Samples to be collected are respiratory material (NPS/OS in ambulatory patients), sputum (if produced), endotracheal aspirate or bronchoalveolar lavage (patients with severe respiratory disease) and serum for serological testing.

Several public health measures that may prevent or slow down the transmission of the COVID-19 were introduced; include case isolation, contact tracing, environmental disinfection, and use of personal protective equipment.[5] For the general population, presently there is no vaccine preventing COVID-19. The best prevention is to avoid being exposed to the virus.[6]

Objective

Objective were to study the occurrence of COVID-19 patients for age, gender and territorial expansion in Kota district and to analyze the sampling pattern in the containment zone.

METHODS

It was a hospital based descriptive cross-sectional study conducted at GMC, Kota hospital from 5 April to 10 May 2020. All the positive patients who were resident of Kota and diagnosed at GMC Kota and admitted at Government Medial College Hospital, Kota were selected for this study. There were 256 patients diagnosed Covid-19 positive at microbiology laboratory, GMC, Kota up to last report on 10 May 2020, four of them belong to other districts and one was not able to give his identity/address due to psychiatric problems so that total five patients were excluded. The total included patients were 251. All the follow up samples considered in this article were up to the last report received on 10 May 2020. A pretested and structured questionnaire was used. Data were entered, processed and analyzed using SPSS version 20.

Inclusion criteria

All the patients were resident of Kota district for more than One month, diagnosed between the period of 5 April 2020 to 10 April 2020 and admitted at GMC, Kota.

Exclusion criteria

Patients not admitted at GMC, Kota and non resident of Kota and those who stayed at Kota for less than one month.

RESULTS

Out of total 251 included patients, 162 were males and 89 females with Male - Female ratio of approximately 2:1. The ratio for male-female is approximately 2:1 (Figure 1). Below the age of 10 years, Males and females were equally affected. The percentage difference for the gender is increased up to age of 49 years in the favors of males and then this difference decreased up to the age of 59 years and approximately equalized at 69 years and beyond that age again suddenly increased in favors of males (Table 1).

The most affected containment zones are Chandraghata (67.20%) followed by Suket (13.20%) leading ahead to Bhimganjmandi (08.80) and Anantpura (03.60%).

When compared with the numbers of positive cases, the mass sampling was satisfactory in Chandraghata (42.92%) followed by Bhimganjmandi (20.64%) and Anantpura (12.02%) but not satisfactory in Suket and Mandana containment zones (Table 2).

The results of follow up samples shows that 70.89% patients became negative on their first follow up sample, which increased to 80.09% on the second, 82.28% on the third and 96.97% on fourth follow up sample (Table 3).

Ten patients died with the case fatality rate of 03.98% (males - 04.32% and females - 03.37%). Nine out of ten deaths had co-morbid conditions, seven patients had hypertension while four had diabetes mellitus, one had chronic kidney disease (CKD) and one had IHD (Table 4).
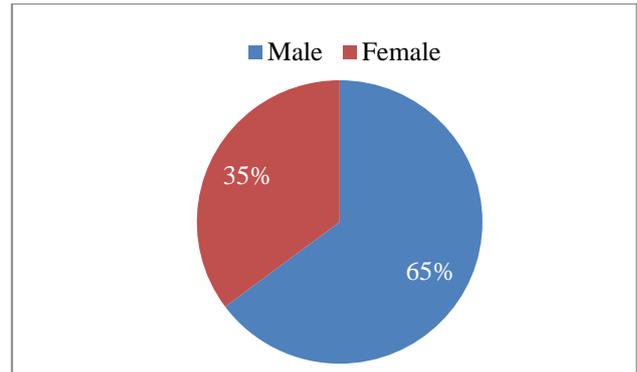

Figure 1: Pie chart for distribution of positive cases with the gender.

Table 1: Distribution of cases according to age group and gender (n=251).

Age group in years	Males	Females	Total
	N (%)	N (%)	N (%)
0-9	03 (50.00)	03 (50.00)	06 (100.0)
10-19	18 (54.55)	15 (45.45)	33 (100.0)
20-29	41 (61.20)	26 (38.80)	67 (100.0)
30-39	39 (72.22)	15 (27.78)	54 (100.0)
40-49	32 (76.19)	10 (23.81)	42 (100.0)
50-59	14 (66.67)	07 (33.33)	21 (100.0)
60-69	10 (47.62)	11 (52.38)	21 (100.0)
70-79	05 (71.43)	02 (28.57)	07 (100.0)
Total	162 (64.54)	89 (35.46)	251 (100.0)

Table 2: Distribution of cases and samples collected according to containment zones.

S. no.	Containment zone	Positive cases (n=251)	Samples collected (n=8465)
		N (%)	N (%)
1.	Bhimganjmandi	22 (08.76)	1747 (20.64)
2.	Chandra Ghata	168 (66.93)	3633 (42.92)
3.	Anantpura	10 (04.00)	1018 (12.02)
4.	Shripura	08 (03.18)	827 (09.77)
5.	Suket	33 (13.14)	187 (02.21)
6.	Itawa	01 (00.40)	49 (05.79)
7.	Khairabad	01 (00.40)	28 (03.31)
8.	Borkhera	02 (00.80)	259 (03.06)
9.	Akashwani	05 (02.00)	684 (08.08)
10.	Mandana	01 (00.40)	33 (00.38)
11.	Total	251 (100.0)	8465 (100.0)

Table 3: Distribution of positive cases according to follow up sample results.

S. no.	Sample sequence	Repeat positive	Repeat negative	Total
		N (%)	N (%)	
1.	First	62 (29.11)	151 (70.89)	213
2.	Second	42 (19.91)	169 (80.09)	211
3.	Third	14 (17.72)	65 (82.28)	79
4.	Fourth	01 (03.03)	32 (96.97)	33
5.	Fifth	01 (12.50)	07 (87.50)	08
6.	Sixth	00 (00.40)	01 (100.0)	01
7.	Seventh	00 (00.40)	01 (100.0)	01

Table 4: Distribution of the died patient (n=10).

Name of medical college	Age	Sex	District	Symptoms/ date of onset	Date of Sample taken 1st	Lab name	Result	Outcome	Date of death	Remark	Other Co-morbid conditions
GMC, Kota	50	M	KOTA	Fever and cough - 5 - 7 days	04.04.2020	GMC KOTA	Positive	Expired	04.04.2020	Covid-19 report received after the death of the Patient	K/C/O IHD
GMC, Kota	70	F	KOTA	No symptoms at the time of admission	05.04.20	GMC KOTA	Positive	Expired	15.04.2020	Covid-19 report received before the death of the Patient	Hypertension
GMC, Kota	65	F	KOTA	SOB - 30 minutes before death	19.04.2020	GMC KOTA	Positive	Expired	19.04.2020	Covid-19 report received after the death of the patient	Hypertension
GMC, Kota	32	M	KOTA	SOB and mild fever - 3 days	24/04/2020	GMC KOTA	Positive C - 5515	Expired	24.04.2020	Covid-19 report received after the death of the patient	Hypertension, DM - T2, CKD
GMC, Kota	70	M	KOTA	Fever and SOB and cough - 3 days	26.04.2020	GMC KOTA	Positive C - 6164	Expired	27.04.2020	Covid-19 report received after the death of the patient	Hypertension, COPD
GMC, Kota	60	M	KOTA	SOB and cough - 3 days	4/27/2020	GMC KOTA	Positive C-6334	Expired	27.04.2020	Covid-19 report received after the death of the patient	Hypertension, DM - T2
GMC, Kota	54	M	KOTA	Fever, SOB and cough - 3 days	03.05.2020	GMC KOTA	Positive C - 9540	Expired	05.05.2020	Covid-19 report received before the death of the patient	Hypertension, DM - T2, IHD (PTCA)
GMC, Kota	47	M	KOTA	Fever, SOB and cough - 3 days	02.05.2020	GMC KOTA		Expired	05.05.2020	Covid-19 report received before the death of the patient	DM - T2
GMC, Kota	48	F	KOTA	Loose motion - 5 days, SOB - 4 days	04.05.2020	GMC KOTA		Expired	05.05.2020	Covid-19 Report received Before the Death of the Patient	Hypertension
GMC, Kota	76	M	KOTA	Fever, and cough, hemoptysis - 4 days and SOB for last 01 day	06.05.2020	Govt.	Positive C - 10716	Expired	07.05.220	Covid-19 report received before the death of the patient	

IHD - ischemic heart disease, CKD - chronic kidney disease, DM - diabetes mellitus, COPD - chronic obstructive pulmonary disease.
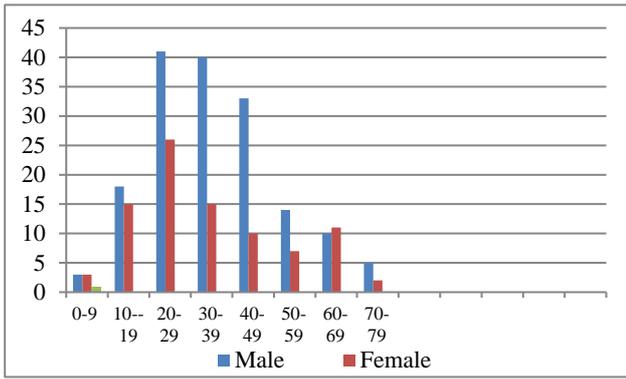
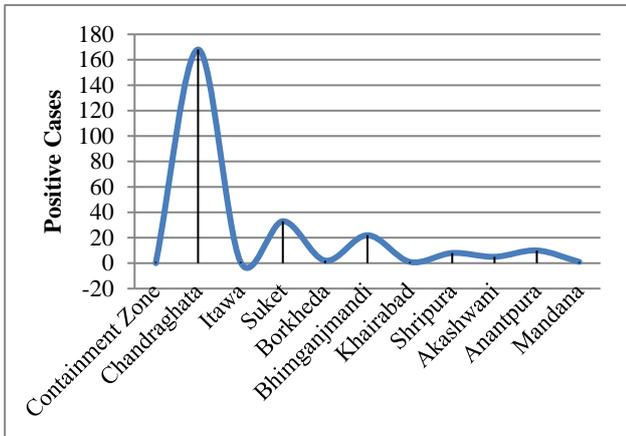**Figure 2: Graphical presentation with gender and age among the positive cases.**

Figure 3: Graphical presentation of positive cases in containment zones.
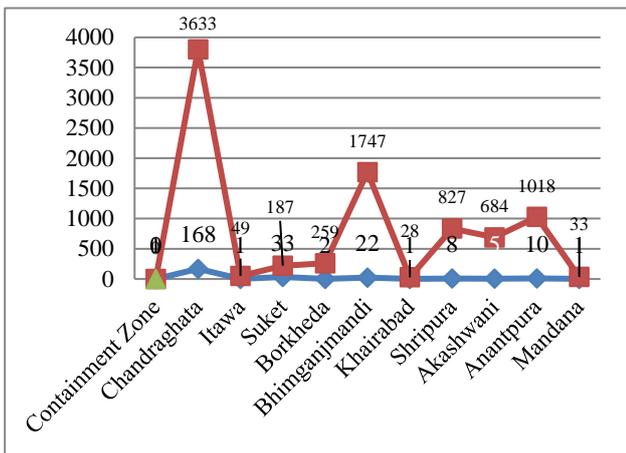

Figure 4: Graphical presentation of positive cases vs samples in containment.

Twenty five patients who became follow up positive even though their first follow up sample was negative whereas 196 patients were labelled as cured after becoming follow up negative twice consecutively (125 on second follow up sample, 39 on third, 24 after fourth, 07 after fifth and 01 after seventh follow up sample report).

Forty five remained positive active cases in whom two consecutive tests were negative. As per follow up sampling protocol their repeat sample will be taken after a certain time interval (flow chart of follow up samples).
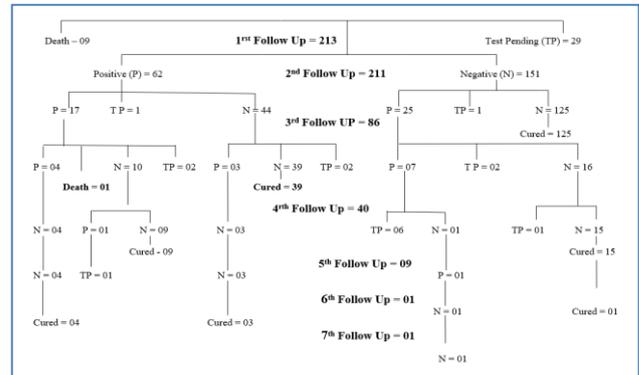

Figure 5: Follow up samples for total positive (n=251).

DISCUSSION

There was male female ratio was approximately 2:1 was exactly similar to Chen et al and comparable to Wang et al which may be due to the fact that in the lockdown period females don't go outside but males tend to go outside (Figure 1).[7,8]

Most of the people affected were between age of 20 to 50 years of age probably due to the fact that younger population tends to go outside for daily needful things and for also for their curiosity (Table 1). The most affected containment zones were Chandra Ghata, Suket and Bhimganjmandi. This may be due to more densely populated area, narrow streets and lesser floor area per person, unavailability of goods in the curfew area, illiteracy, poverty, unwillingness of asymptomatic individuals could also be the probable contributing reasons. The sample collection was good in the initial stages which could be due to fact that there were only one or two containment zones initially to concentrate (Table 2).

Most of the cases were asymptomatic and high conversion rate of positive to negative after the first follow up sample could be due to timely admission, supervised care with used treatment protocol (Table 3). Despite a significant infectivity rate, the case-fatality rate among confirmed cases of COVID-19 was 3.98% similar to Cascella et al (03.70%) and Singhal et al (2-3%) with the majority of deaths typically occurring among the elderly patients (age >45 years) as also reported by Singh et al.[9-11] Most of the deaths had multiple co-morbidities similar to the study by Wang et al (Table 4).[8] Illiteracy, not following the rule of distancing during hospital stay, non availability of separate rooms for each patient with the use of common toilet may be the probable cause of follow up positive even though their previous follow up sample report was negative (Figure 5).

CONCLUSION

Males are more affected then females. Maximum numbers of cases were between 20-50 years of age. Sampling pattern was not uniform but was satisfactory except Suket and Khairabad containment area. Most of the patients were asymptomatic and cured with the baseline treatment protocol.

Incidence of Covid-19 positive patients at different places having different geographical socio-economic and cultural conditions is found to be different. A lot of it could depend on pattern of sampling which need to have uniform.

The results do not justify the labelling of the asymptomatic or mild Covid-19 positive patients as cured just after the first follow up negative as the 16.55% of patients tested positive after becoming negative once.

Most common co-morbidities in fatal Covid-19 patients were chronic kidney disease (CKD), diabetes mellitus (DM), hypertension and chronic obstructive pulmonary disease.

Recommendations

We need to apply more aggressive and uniform approach to the sampling in containment zones, sampling of asymptomatic individuals of all the close contacts and nearby residents of positive patients. This uniform sampling policy needs to be adopted throughout the country so that the true incidence is known and appropriate measures can be taken. This policy of pooling of samples also needs to be uniformly redefined.

We have to go for aggressive approach for screening of population with Co-morbidities. This could be done with the help of the data and Manpower available with district Health Administration and Inter-sectoral Coordination with ICDS department, district Administration and the department of Social Welfare.

As per guidelines by ICMR, we can give hydroxy chloroquine sulphate to the contacts of Positive patients prophylactically irrespective of their sample result because in many cases they became positive despite their First follow up sample negative. We can also start a policy like as Weekly Iron Folic Acid Supplementation Programme (everyone has to take a tablet at the same time and same day) to ensure the intake of tab HCQ to every health care worker for prophylaxis.

Mere efforts should be taken to increase paperless work in the offices especially in the COVID care center hospitals and dedicated COVID care Centers to minimize the transmission of infections due to Bed headed tickets and other stationary items. For management purpose, it may be appropriate to discharge asymptomatic patients without repeat test or testing once but it would be appropriate if patient are labelled cured after two consecutive negative follow up tests.

Mere efforts should be taken to increase paperless work in the offices especially in the COVID care center hospitals and dedicated COVID care centers to minimize the transmission of infections due to bed headed tickets and other stationary items. Definition of cured patients need to be reconsidered as the patients became positive even after becoming negative in their previous follow up sample report.

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