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# GENDER DIFFERENCE IN CO MORBIDITY AND RECOVERY AMONG NCOV-19 INFECTED PATIENTS.

Medicine

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## ABSTRACT

**Background:** The COVID-19 is a global public health emergency with various known and unknown factors that determines the pathology, course and outcome. Female gender and pregnancy is considered as a significant risk factor for morbidity and mortality of viral epidemics, this signifies needs to study gender difference in COVID-19.

**Methods:** In this retrospective chart review study, categorization of confirmed COVID-19 cases as per gender was done and compared among them in terms of their risk factors involved like presence or absence of risk factors, summation of risk factors, received HCQS or not age above 55 years and early vs late recovery and mean virus clearance **days.**

**Results:** A total of 112 patients with mean age of 31.36± 14.84 years consisting 68 (60.7%) males and 44 (39.3%) females and 12 (10.7%) pregnant and 6 (5.4%) during purpeurium were analysed. There was early recovery among 41 (36.6%) and 02 (1.8%) death in ours sample. There was significantly higher association of risk factors as co morbid conditions with female (Chi square value = 22.099,df= 1 and p-value =.000), lower treatment allocation by HCQS (47.7 % of females) (chi square = 8.655, df=1, p=.003), and only 22.7% of females recovered in contrast to 45.6% of male patients (chi square = 6.016, df=1, p=.014).

**Conclusions:** This study found significant association of female gender with higher risk factors, which restricts use of HCQS administration and delayed recovery.

## KEYWORDS

COVID -19; Gender; Virus clearance.

## INTRODUCTION

The coronavirus disease 2019(COVID-19), is a global publichealth emergency of this present time, and it is yet evolving in different geographic and clinical features. There are various known and unknown factors that determines the pathology, course and outcome of covid 19. Female gender and pregnancy is considered as a significant risk factor for morbidity and mortality of viral epidemics [1].

Pregnancy is considered always an additional risk factor for coronavirus infection due to factors like gestational diabetes, relative immunosuppression of the TH1 response, makingpregnant women more susceptible to viral infections [2]; and expression of the ACE2membrane protein, the receptor for both SARS-Cov and SARS-Cov-2 is relatively increased during pregnancy [3].

However the symptoms of COVID-19 pneumonia during pregnancyare mainly fever and cough similar to others, but there are no evidence forvertical transmission in late pregnancy [4].

Abundant research has been conducted to date in order to understand the features of CoV-2 infection, Yet, very little is knownabout the gender aspects of COVID-19.

In view of this, we planned this retrospective chart review study to see the gender difference among confirmed COVID-19 cases, in relation to socio demographic risk factors and response to treatment.

## METHODS

This study is a retrospective chart review, to see the effect of Hydroxychloroquine (HCQS) in virological clearance of RT-PCR documented SARS-CoV-2 positive patients. This study is chart review of dedicated COVID Health Centre (DCHC), Rajendra Institute of Medical Sciences (RIMS) , Ranchi between 31st March 2020 to 30th may 2020.

The information of all hospitalized patients with confirmed COVID-19 were included in this study if they fulfilled the primary criteria of being RT-PCR documented SARS-CoV-2 positive in nasopharyngeal& throat sample at admission regardless of their clinical status. There was record of all patients detailed history, that

was taken and clinical examination was doneat the time of admission. The treating physician screened for their suitability for administering HCQS and decided about HCQS administrating or not. The main contra indication to HCQS was patients with significant cardiac, renal co-morbidity, higher age, ECG abnormality, pregnancy, lactation and patients unwilling to take HCQS.We made this group in ours study as control group.

The all HCQS group cases were given HCQS at a dose of 400mg P.O. on day one and 200mg next 4 days. There was fixed duration re assessment of RT-PCR testing for corona by naso pharyngeal swab. This primary endpoint ofvirological clearance at day-7 was repeated after 2 days if it had been negative to reconfirm the patient status. All test were done by RT-PCR with samples from nasopharynx&throat.

### Statistical Analyses

Data was entered in Microsoft Excel (2016) and further the collected data of all patients was statistically analyzed, using Statistical Package for Social Sciences (SPSS, Inc., Chicago, Illinois) version 10.0.

Data analysis included means and standard deviations for each group, and clinical subgroup of the sample. Chi square test was used for categorical variables to determine if differences existed between the groups.The Non parametric Mann whitney U test was used for comparison of continuous variable and Statistically significant levels are reported for p values less than or equal to 0.05. Highly significant levels are p values less than .001.

## RESULTS

A total of 112 patients were included for the study with mean age of 31.36± 14.84 years and mean days for attaining virus free status with treatment it was found to be 8.88± 2.84 days. Similarly across the variables there was 68 (60.7%) males and 44 (39.3%) females, among the female patients of corona 12 (10.7%) were pregnant and 6 (5.4%) were during purpeurium. Overall 102 (91.1 %) of sample population was below 55 years of age and remaining 10 (8.9%) were above 55 years of age. There was 04 patients of CMP,09 patients of diabetes, 06 patients of hypertension and 01 each patients of hypothyroidism and CKD.Among the total sample size of 112 patients the treating team clinically decided to treat 72 patient with HCQS and remaining 40 patients were treated without HCQS. There was early recovery within 7 days among 41 (36.6%) patients and recovery after 7 days was for 71 (63.4%) patients. There was only 02 (1.8%) death in ours sample population during admission. Table 1 summarizes the sample characteristics of the whole sample(Table -1).

We categorise sample as per gender and compared among them in terms of their risk factors involved like age above 55 years, presence or absence of risk factors, summation of risk factors, received HCQS or not and recovery in terms of virus clearance days as early vs late and mean virus clearance days. We considered age of 55 and above as a risk factor, with presence of chronic medical illness like diabetes, hypertension, cardiomyopathy, chronic kidney disease and thyroid disease, in addition to pregnancy and perpeurium. The study groups were observed across for frequency distribution and pearson chi square test was done to compare (Table-2).

The age category of above 55 years and below 55 years of age across gender was similar in frequency distribution. We found significantly higher association of risk factors as co morbid conditions with female gender in comparison to male gender (Chi square value = 22.099,df= 1 and p-value =.000). We also found significantly higher risk factors including age above 55 among female gender (Chi square value = 13.226,df= 1 and p-value =.000). Also treatment allocation by HCQS to patients was significant lower among female gender due to higher co morbid risk factors, HCQS was not allocated to 25% of males and 52.3% of females (chi square = 8.655, df=1, p=.003). In terms of becoming virus free on testing within 7 days of treatment only 22.7% of females recovered in contrast to 45.6% of male patients (chi square = 6.016, df=1, p=.014) (Table-2).

We further categorised our sample within female gender as with or without pregnancy or perpurium which was 17 and 27 respectively. However there was no significant difference in age and mean virus clearance time across presence or absence of pregnancy and perpeurium (Table 3). The analysis of virus clearance time in days, which was 9.18 ± 2.76 for non-pregnant and non perpeurium group and for pregnant and perpeurium group it was 9.05 ± 2.24 days (Man Whitney U test value = 224.50, p= .900) (Table-3).

## DISCUSSION

In this retrospective chart review study, we aimed to see the gender difference and effect of pregnancy and perpeurium among confirmed COVID-19 cases. The virologic clearance in days declared by naso pharyngeal swab negativity of RT-PCR across groups were compared. The result showed that female gender is associated with significantly higher co morbid medical risk factors in addition to pregnancy and perpeurium. This disadvantageous profile further leads to non selection for HQCS treatment, and impairs or delays recovery in terms of virus clearance.

We found our sample consisted of 60.7% males and this gender distribution is in accordance to a meta-analysis showed that the male took a larger percentage in the gender distribution of COVID-19 patients 60% (95% CI [0.54, 0.65]) [5]. Yet another two metaanalysis reported 56.9% [6] 53.3% [7] male representation to illness.

We found highest co morbidity of diabetes (8%), followed by hypertension (5.4%), Cardio myopathies (3.6%), chronic kidney disease (0.9%) and hypothyroidism (0.9%) in ours sample. These co morbidity is relatively less then Chinese study of 1590 patients [8] reporting hypertension (16.9%), followed by diabetes (8.2%).

The presence risk factors and multiple risk factors are associated with poor prognosis as [9,10] is well known in literature, and we found similar findings but in addition we found that female gender is associated with poor prognostic risk factors, pregnancy and perpeurium. However there are various reasons possible for male predominance of illness, but there was significant association of risk factors with female gender. This risk factors and pregnancy contraindicated HCQS administration and further caused delayed viral clearance among female gender. Literature also suggest self under reporting of comorbidities on admission, this could also lead to over-estimation of strength of association with adverse outcome [8].

## CONCLUSION:

This study found significant association of female gender with higher risk factors, which restricts use of HCQS administration and delayed recovery.

### Acknowledgements

All COVID-19 patients, health care workers, administrators and Covid task force at RIMS, Ranchi.

**Table 1: socio demographic characteristics and distribution of the sample. N= 112**

| | Variable | Total sample (n =112) |
|---|---|---|
| Mean age ± SD in years | | 31.36± 14.84 |
| Mean days for attaining virus free status ± SD | | 8.88± 2.84 |
| | | N (%) |
| Gender | Male | 68 (60.7%) |
| | Female | 44 (39.3%) |
| Recovery | Within 7 days | 41 (36.6%) |
| | After 7 days | 71 (63.4%) |
| CMP | Present | 04 (3.6 %) |
| | Abscent | 108 (96.4 %) |
| Diabetes | Present | 09 (8 %) |
| | Abscent | 103 (92 %) |
| CKD | Present | 01 (0.9 %) |
| | Abscent | 111 (99.1 %) |
| HTN | Present | 06 (5.4 %) |
| | Abscent | 106 (94.6%) |
| HypoThyroidism | Present | 01 (0.9 %) |
| | Abscent | 111 (99.1 %) |
| Treatment | HCQS Given | 72 (64.3 %) |
| | HCQS Not Given | 40 ( 35.7 %) |

**Table 2: Group comparison across gender for age, comorbid physical illness, risk factors, HCQS treatment and recovery type.**

| Sl no | Variables | Sub variables | Study groups n (%) | | Pearson Chi square | DF | p |
|---|---|---|---|---|---|---|---|
| | | | Male(68) | Female (44) | | | |
| 1. | Age | Above 55 | 8 (11.8) | 2 (4.5) | 1.712 | 1 | .191 |
| | | Below 55 | 60 (88.2) | 42 (95.5) | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2. | Combined Physical illness | Comorbid | 6 (8.8) | 21 (47.7) | 22.099 | 1 | .000* |
| | | Risk factor free | 62 (91.2) | 23 (52.3) | | | |
| 3. | Risk cat +age | High risk | 12 (17.6) | 22 (50) | 13.226 | 1 | .000* |
| | | Low risk | 56 (82.4) | 22 (50) | | | |
| | Hydroxychloroquine | Received | 51 (75) | 21 (47.7) | 8.655 | 1 | .003* |
| | | Not received | 17 (25) | 23 (52.3) | | | |
| 6. | Recovery type | Early | 31 (45.6) | 10 (22.7) | 6.016 | 1 | .014* |
| | | Delayed | 37 (54.4) | 34 (77.3) | | | |

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