Original Research Article

Health Care Associated COVID-19 Infections, infection prevention and hospital epidemiology amongst COVID-19 infected health care personnel in a 1000 bedded tertiary care hospital in Northern India

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Abstract

Background: Health Care Workers (HCWs) of all levels and groups are involved in caring for patients and evidence indicates that they are particularly at risk of acquiring Severe Acute Respiratory Syndrome Coronavirus2 (SARS-CoV-2) infection, due to repeated occupational exposure. **Methodology:** This retrospective cross sectional study was conducted in Government Medical College (GMC), Jammu. Data was collected in a pre-structured questionnaire. **Results:** Prevalence in HCWs was 21.5% and mortality being 0.3%. 82% were symptomatic. Fatigue was the commonest symptom observed. 290(68%) were doctors and 140(32%) were paramedical staff. **Conclusion**: This data on prevalence of infection in HCWs can help to plan policies on how to prevent our HCWs and how to use this overstrained health resource in the present difficult times.

Keywords: COVID-19, Health Care Workers, Epidemiology

Introduction

In December 2019, the novel Coronavirus disease (COVID-19) caused by SARS-CoV-2 emerged in China, followed by a rapid spread all over the world. On March 11, 2020, the World Health Organization (WHO) raised its pandemic alert. At the time of writing this article (December, 2020), there are more than 55.6 Million cases globally and almost 1.34 Million fatalities. In India the cases reaches to 9 Million with 132 K deaths. Whereas in Jammu, this number is 97,537 with 1618 deaths [1]. HCWs are at increased risk of acquiring the infection because of repeated occupational exposure. A 34 year old ophthalmologist in Wuhan Central Hospital, Dr. Li Wengliang, died due to COVID-19 on February 7, 2020 in Wuhan. He was recognized by Petersen *et al* [2] as "a face to the frontline healthcare worker. The first doctor to notify the emergence of the SARS-CoV-2, (COVID-19), outbreak". Regarding prevention of infection, social distancing, use of face masks and frequent hand washing with alcohol rubs or soap are the measures advisable for general population [3]. However, Health Care Workers (HCWs) are being exposed to much higher risk, therefore needs additional protective measures [4] like wearing of Personal Protective Equipment (PPE) like gown, gloves, face shield, shoe cover, N95 masks.

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These protective gears are useful in settings where generation of aerosols from the respiratory tract is suspected like in cases of nasopharyngeal swab collection, endotracheal intubation or respiratory suctioning [5]. HCWs of all levels and groups are involved in caring for patients and evidence indicates that they are particularly at risk of acquiring SARS-CoV-2 infection, due to repeated occupational exposure [6]. Clinicians are at the highest risk for acquiring the infection because significant proportion of the population consults them due to fever and its related symptoms, and hence they become the first point of contact.

Current COVID-19 pandemic is unprecedented and as the numbers expand exponentially, paucity of data regarding health care workers who are at the forefront of this disaster exists. Hence we decided to conduct a study which is the first one from Jammu, to throw some light on the prevalence of infection in Health Care Workers in a tertiary care hospital.

Material and methods

This is a cross sectional study conducted in Department of Microbiology, GMC Jammu. Exposure, epidemiologic, demographic, clinical, laboratory and radiologic data was collected in a pre-structured questionnaire from previous positive HCWs with their consent. Individuals with a history of close contact with a positive case outside the workplace such as with family members or close friends were excluded from our study.

Results

2000 Health Care Workers were tested over a span of 9 months from April to December, 2020 that included doctors and paramedical staff working in GMC, a tertiary medical college in Jammu. Out of those, 430 health care workers were found to be positive i.e. 21.5% and 1 doctor died of COVID-19 related complication. Maximum HCWs were in the age group of 20-30 yrs (258) followed by 31-40 yrs (137)

and >41yrs (35). Use of PPE was documented in HCWs working in COVID-19 designated wards and COVID-19 testing Laboratories. Every non first line HCW who attended patients in general was provided with N-95 masks. Testing was performed either after presentation of symptoms or after giving COVID-19 duties, or in cases with unprotected close contact with confirmed COVID-19 colleague on duty. Based on the history, 64% were found to be positive after contact with infected patient while giving duties, 20% had contact history with the infected colleague on duty rest 12% had the history of laboratory exposure while 4% had no opinion regarding the exposure. Out of total 430 HCWs affected, 290(68%) were doctors and 140(32%) were paramedical staff. 40% of the postgraduates were from the Surgery Department, 20% from Anaesthesia Department, 10% from Gynaecology, 5% from ENT, 5% from medicine and rest 20% from miscellaneous branches. 10% HCW's had the history of diabetes and hypertension, whereas in rest there were no underlying diseases. 77(18%) were asymptomatic while, 353(82%) were symptomatic. The different symptoms observed are given in fig.1. According to MOHFW guidelines, they were categorized as mild and moderate and severe symptomatic and they were managed at dedicated COVID Care Centres or put under home isolation. Temperature was recorded and in all febrile patients, it was above 100°F. 20% became afebrile on day 2 of taking antipyretics but in 80% patients, fever remained for 5 days. Diagnosis was made by RT-PCR testing using LabGun kit, provided by ICMR under protocols set by them. After becoming positive, maximum (90%) became negative at day 14 and rest 10% at day 28. Chest X-Ray PA view did not show any abnormal findings in 95% cases. Chest CT was performed only in 5% cases. LFT, RFT and CBC were deranged in 15% cases while in others, they were within range. For treatment, Vitamin C, antibiotics was given to every admitted HCW. Cough syrup was added to 10 patients with dry cough and patients with body aches were given Vitamin D. 90% of HCWs became negative on 14 days after testing positive and they were discharged after that.

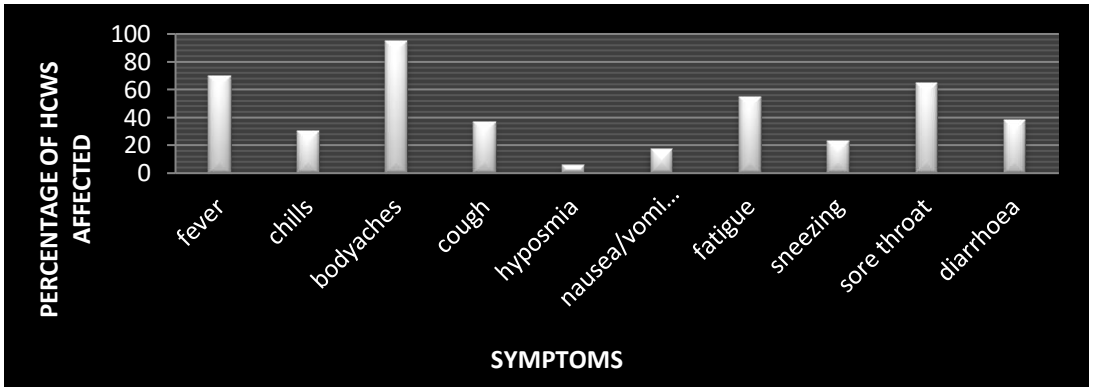

Fig I. Percentage of HCWs presenting with different symptoms

Discussion

The Healthcare system all world over, has been overwhelmed by the deluge of COVID-19 patients, overcrowding in hospitals and thereby putting immense strain on healthcare facilities and healthcare professionals. COVID-19 has exposed health workers and their families to unprecedented levels of risk. The present study provides an insight into the infection status of HCWs in Jammu region during the COVID-19 pandemic along with the need for proper equipment use and education of these individuals.

Our report demonstrated the prevalence of 430 individuals (21.5%) amongst HCW. In a study conducted by Jha S *et al* [7] there was a prevalence of 3.6 %. Mortality in our study was 0.3%. A study by Mahajan N *et al* [8], observed 1% mortality and 11% prevalence. High prevalence in our study shows saturated Health sector and exhausted HCWs. 20 to 30 years was the age group which was maximum affected which is similar to the study of Chatterjee P *et al* [9] and Sabetian G *et al* [10]. This is because of prolonged working hours, working without breaks, work-related stress which added to the burden of COVID-19 positivity. Every health care worker was provided with N95 masks and use of PPE was documented in HCWs working in COVID-19 dedicated wards. But reuse of PPE was concluded as a risk factor for COVID-19 positivity. Out of 290 doctors i.e. 68% of total health care workers, 200 (70%) were postgraduates from different branches, and rest (30%) were senior faculty. The high positivity in PGs demonstrates the fact that they were on forefront more as compared to the senior doctors and thereby, increased cases of infection in them. Infection among clinical departments was more as compared to para clinical and non clinical departments, because of the direct patient contact and unknown COVID-19 status of the patient at the time of management of an emergency. Present study also shows that of all the 140(32%) paramedical staff, Nurses (40%) were affected more as compared to others like Laboratory Technicians (35%), Operation Theatre Technicians (15%) and grade IV employees (10%) due to the fact of them being in direct contact with patient care which increases the risk of acquiring infection.

The clinical features of COVID-19 varied, ranging from asymptomatic state (in 18% cases) to Acute Respiratory Distress Syndrome and Multi Organ Dysfunction, because of which, 1 doctor lost his life. We observed a high positivity in symptomatic cases as compared to the asymptomatic cases, a finding similar to the study of Jha S *et al* [7]. The common presenting symptoms were fever, fatigue, dry cough, myalgia and dyspnoea, while few patients presented with vomiting, diarrhoea, nausea, and new-onset anosmia or ageusia. From our study, it can be concluded that fatigue was the most common clinical feature followed by fever, sore throat, diarrhoea and cough. Sabetian G *et al* [10] observed in their study that symptomatic (65.5%) cases were more as compared to the asymptomatic cases (35.5%) and cough (45.4%) being the common presenting feature followed by sore throat. This disparity in symptomatology can be because of the geographical difference in the circulating strain of the virus.

Conclusion

In the early phase of the COVID-19 outbreak, the number of HCWs was insufficient, and the continuous working hours of HCWs were relatively longer. Therefore, the HCWs were exhausted physically and mentally. These situations lead to decreased immunity which predisposes the HCWs to the increased chances of infection. The wellbeing of HCWs can be promoted by ensuring that infected colleagues are promptly tested and isolated [11,12] providing sufficient time to take rest to ensure adequate sleep, avoid overwork, consuming nutritious diet and supplements to increase the immunity. Availability of data on prevalence of infection in HCWs will help in planning the policies regarding the best use of overstrained health resources in the present difficult times.

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