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An Analysis of Risk Assessment of Health Care Workers Exposed to COVID -19 Cases

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Abstract **Original Research Article**

Introduction: People most at risk of acquiring the disease are those who are in contact with or care for patients with COVID-19. This inevitably places health care workers (HCWs) at high risk of infection, especially when there is a breach in the personal protection while managing patients for categorization of risk in exposure to COVID-19 in health care workers, a risk assessment tool in the form of questionnaire has been devised by The Ministry of Health & Family Welfare (MoHFW), Directorate General of Health Services after the risk assessment of HCWs as high or low risk, management is done according to the recommendations. ***Materials & Methods:*** We analyzed the data collected by the Risk Assessment Committee members of Health care workers exposed to COVID 19 for a period of 1year from June 2020 to June 2021. After the interview of HCWs, they were categorized as high or low risk. ***Results:*** *Risk assessment committee(*RAC) members interviewed a total of 1660 HCW contacts of 144 index cases in one year period from June 2020 to June 2021. Our contacts include doctors, nurses, technicians, sanitation worker and other staffs. Index cases were mostly HCWs except few, who were patients. On an average, we used to receive a list of 8-12 contacts for each index case from the Contact Tracing Committee. Out of 1660 contacts, we found 241(14.5%) were high risk and 1419 (85.4%) low risk. ***Conclusion:*** Risk assessment of HCWs not only reduces the burden of disease in HCWs, but also prevents unnecessary quarantine of low risk category and shortage of man power as more scientific evidence on COVID-19 becomes available, more accurate validated risk prediction scores will facilitate more precise estimates of individual risk.

Keywords: Risk assessment, Covid 19, Exposure, High risk, Low risk, Health care worker.

INTRODUCTION

Current evidence suggests that the virus that causes COVID-19 is transmitted between people through close contact and droplets. People most at risk of acquiring the disease are those who are in contact with or care for patients with COVID-19. This inevitably places health care workers (HCWs) at high risk of infection, especially when there is a breach in the personal protection while managing patients. Here, comes the need to provide guidance on preventive measures, isolation and quarantine of health care functionaries. For categorization of risk in exposure to COVID-19 in health care workers, a risk assessment tool in the form of questionnaire has been devised by The Ministry of Health & Family Welfare (MoHFW), Directorate General of Health Services Table-1 [1]. This tool is for health care facilities with COVID 19 patients. The form should be completed for all HCWs who have been exposed to a patient with confirmed COVID-19. After the risk assessment of HCWs as high or low risk, management is done according to the recommendations.

The aims and objectives of the study are to interpret the factors responsible for high risk exposure in health care workers.

MATERIALS AND METHODS

This hospital based retrospective, descriptive study was conducted among heath care worker exposed to covid 19 case in a tertiary care hospital NEIGRIHMS, Shillong from June 2020 to May 2021**.** Being a tertiary healthcare facility along with managing COVID patients, we had all the facilities and arrangements made according to the Advisory issued by the MoHFW. A Risk Assessment Committee (RAC) was formed with faculties from different departments to assess the level of risk exposure (high or low) for the contacts of COVID-19 positive HCW or patient at our hospital. Positive status of index case was informed to nodal officer. Nodal officer informed contact tracing team about index case. The list of all possible contacts was provided by the Contact Tracing Team. This system is in place since May- June 2020. After receiving the list, RAC members used to interview the contacts immediately over phone and categories them as high or low risk. High risk exposure:

- HCW or other person providing care to a COVID-19 case or lab worker handling respiratory specimens from COVID-19 cases without recommended Personal Protective Equipment (PPE) or with possible breach of PPE.
- Performed aerosol generating procedures without appropriate PPE.
- HCWs without N95mask/face-shield/goggles (recommended PPE in designated COVID and non COVID areas).
- Having face to face contact with COVID-19 case within 1 metre for more than 15 minutes.
- Having accidental exposure to body fluids.

Low Risk Exposure

Contacts who do not meet criteria of high risk exposure. Those contacts whose risk categorization got confusing, the RAC members used to discuss in details amongst themselves and also with the Nodal Officer to finally assign the risk category. Our questionnaire tool (Table1) for contact interview was adopted from the MoHFW guidelines [1].

Table 1: COVID-19 Virus Exposure Risk Assessment Form for Health Care Workers (HCW)

Health Care Worker Information	
Name:	**Department**
Phone number	Age (in completed years) E. Gender
Current place of stay:	
Type of HCW (specify), & Designation (Doctor, Nurse, Technician, others)	
HCW interactions/ activities performed on COVID-19 patient information	
Date of exposure to confirmed COVID-19 patient	
Place of exposure:	
COVID-19 Patient details Patient symptomatic since (Date) Test sample sent on (Date)	
Source control (Source/patient wearing a cloth face covering or facemask)	Yes/ No
Approximate min. Distance from the patient (in meters)	
Duration of contact (minutes)	
Aerosol-generating procedure was performed on the patient?	Performed Present/Not Present
G2. If yes, what type of procedure	Intubation/Nubulisation Airway suctioning,Tracheostomy Collection of sputum, Bronchoscopy, CPR Other:
Accidental exposure to body fluids	Yes/No
Did you have direct contact with the environment where the confirmed COVID-19 patient was cared for? E.g. bed, linen, medical equipment, bathroom etc.	Yes/No/Unknown
During the health care interaction with a COVID-19 patient, did you wear PPE	Yes/ No
J2. If yes, which of the below items of protection used: 1.Surgical triple layer mask 2. N95 mask 3. Single use gloves 4. Disposable gown 5. Face shield or goggles/ protective glasses	 Yes/ No Yes/ No Yes/ No Yes/ No Yes/ No
Did you perform hand hygiene after touching the patient's surrounding (bed, door, handle etc.), regardless of whether you were wearing gloves?	Yes/ No/ NA

We analysed the collected data and also interpreted the factors responsible for high risk exposure.

RESULTS

RAC members interviewed a total of 1660 HCW contacts of 144 index cases in one year period from June 2020 to June 2021. Our contacts include doctors, nurses, technicians, sanitation worker and other staffs. Index cases were mostly HCWs except few, who were patients. On an average, we used to receive a list of 8-12 contacts for each index case from the Contact Tracing Committee. Out of 1660 contacts, we found 241(14.5%) were high risk and 1419 (85.4%) low risk Table-2. Demographic Profile of these high risk and low risk contact is presented in table-3.Contacts was also enquired regarding their last significant exposure with the index case in terms of duration of contact and proximity. The low risk cases were advised to continue their work with strong vigil for symptoms. They were also advised to test themselves with RT-PCR on being symptomatic. High risk cases were put on 7 days quarantine- home or institutional according to feasibility. They were also advised to do RT-PCR at 5 days or earlier if symptomatic.

On analysis of the history of high risk cases, factors responsible were mostly having food together, long conversations> 15 minutes in very close proximity < 1 metre without wearing mask or proper PPE, using the Changing Room together, commuting in the same vehicle from home to work and back.

COVID appropriate behaviour was reinforced amongst all HCWs time and again stressing on:

- Washing Hands.
- Wearing Mask.
- Watch Distance.

Out of the 241 high risk cases, 5 turned out to be COVID positive, which is roughly around 2%. This might be due to stricter measures adopted and is noteworthy. The number of COVID positive among low risk was only 7(0.5%). It is observed that COVID positivity is negligible in COVID critical care areas as compared to non COVID areas. That might be because PPE policies were strictly adhered to, underlining the importance of an effective PPE policy. Strict adherence to strict protocols can only contain the disease from spreading like wild fire with devastating consequences.

Table 2: Risk Category

Risk category	No. of cases	Percentage	Turned covid +ve	Percentage
High risk	241	14.5%	5	2%
Low risk	1419	85.4%	7	0.5%
Total contacts	**1660**		**12**	

Table 3: Demographic Profile of Contacts

Sex	Low Risk	High Risk
M	774	112
F	645	129
Age (yr)		
20-30	221	22
30-40	749	92
40-50	319	88
>50	130	39
Socio-economic status		
Low	453	53
Middle	726	121
High	240	61

DISCUSSION

Man is a social animal. But the new norm is no socializing. No doubt COVID-19 has far reaching complications even to the extent of death, but prevention is only some few basic measures away. Health care workers acquire COVID- 19 infection at a higher rate than the general population. Even in our study in the period from June 2020 to May 2021, we assessed contacts of 144 index cases. In a total of 1660 contacts, 241 were high risk and 1419 low risk. Looking at the numbers, it appears that certain actions are recommended strongly to reduce the burden of HCWs getting affected.

Recommended action for HCWs:

- Ensure that frequent and proper hand sanitization either with soap and water or alcohol based hand rub are followed at all times.
- Respiratory Etiquettes (using tissue paper or handkerchief while coughing or sneezing) are practiced always.
- Appropriate PPE use at all times in duty hours.
- Any breach in PPE and exposure to be informed immediately to the Nodal Officer.
- Social distancing and proper masking should always be followed.

Even under the laid down protocols, there are exposures to COVID-19 cases, which might be either high or low risk. This risk assessment tool is important for proper categorization of risk and also to decrease the quarantine of health care workers and save man power at work. The RAC is an emergency team providing prompt services as and when required. There is also an advisory for Personal Protective Equipment (PPE) protocol for hospitals [2]. In spite of that, there is COVID-19 transmission in HCWs at work place. Transmissions are also common beyond working hours. Like in our study also, commuting in the same vehicle, having food together are common factors in high risk exposure. Since, the policy of mandatory quarantine after COVID ward duty is no more there, such HCWs when interact with non- COVID duty HCWs pose significant risk. COVID appropriate behavior is a must to ward off the risk. A recent study from Wuhan has linked proximity to COVID-19 patients, long duty hours, and suboptimal hand hygiene as possible risk factors for COVID-19 infection in HCWs [3]. Sometimes, even difficulty and lack in widespread reliable testing and the uncertainty of the diagnostic criteria are associated with the transmission of infection to HCWs [4]. Even stressful working environment, long working hours leading to fatigue and isolation related psychological issues contribute to increased chances of COVID- 19 infection in HCWs [5]. Some other factors which can make HCWs vulnerable to infection could possibly be inadequately cleaned and sanitized hospital surfaces, compromise in disinfection of medical equipment and lack of training and education related to the viral pandemic [6]. The health regulatory bodies should start with training and education of medical and supporting staff including nurses, technicians, dentists, doctors, paramedics, receptionists and cleaners through online or offline (wherever feasible) mandatory courses according to the updated protocols as issued by WHO and Centre for disease control (CDC) [7, 8].

Limitations of the Study

As the study depends on self-reported assessment, under-or over-reporting is very likely. People may give wrong information due to poor recall or to avoid the inconvenience of institutional quarantine. There is also a probability that health workers may be exposed to COVID-19 from community transmission which can`t be ruled out from this study.

CONCLUSION

Risk assessment of HCWs not only reduces the burden of disease in HCWs, but also prevents unnecessary quarantine of low risk category and shortage of man power in the hospital. Research and audit programmes are needed at every level and every visible aspect to determine the impact of COVID-19 on healthcare workers. As more scientific evidence on COVID-19 becomes available, more accurate validated risk prediction scores will facilitate more precise estimates of individual risk. Before it becomes a work place hazard, the HCWs should not fall short off any of the COVID preventive measures and keep going with the services. Hope, in the coming days, more accurate and validated risk prediction tools will hardly find any contact to assess with strict COVID protocols in place.

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