



Preventive and Control Measures of COVID-19 Patients: A Review

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Abstract

Covid19 is an acute respiratory disease which is caused by a novel coronavirus. This virus has been found in January 7, 2020 from China. The virus was previously known as 2019-nCoV. This particular virus is high chance of spread. Preventive measures are very essential for the health care workers. Proper preventive measures can only be applied to stop the spread of this virus. [*Bangladesh Journal of Infectious Diseases, April 2020;7(suppl_1):S41-S44*]

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Introduction

An acute respiratory illness caused by a novel coronavirus was first reported in China. The virus has been nomenclature as SAR-COV2 which was previously known as 2019-nCoV¹. This particular virus belongs to β -coronaviridae, is one of the three human coronavirus that caused human catastrophe

since 2002 after SARS-COV and MERS-COV¹. The virus infects upper and lower respiratory tract and binds more strongly to ACE2 receptor than its homologous virus SARS-COV. The most important routes of transmission are therefore through respiratory droplets and close contact².

Chances of Transmission

Droplet infection results from transmission of a water particle (usually 5-10 μm in diameter) containing virus. Direct human to human transmission occurs through air droplets among persons who are in close contact within 1 meter. Moreover, droplet infection has also been documented indirectly through surfaces of fomites³. Air-borne transmission may occur in special situation where aerosol generating medical or surgical procedures are under taken. However, in a study in China among 75465 COVID-19 cases no direct airborne transmission was recorded⁴. Although SARS-COV2 infects upper or lower respiratory tract, viral shedding in the blood is common, hence transmission of SARS-COV2 through blood is also a theoretical possibility⁵. It is crucial to know the transmission dynamics of infection for future plan and preparedness against spread of the disease⁶. Therefore, the strategy should emphasize to prevent droplet infections among the contacts with COVID-19 patient and airborne precaution should be taken in special situations like tracheostomy, bronchoscopy, endotracheal intubation, open suctioning, manual ventilation⁷.

Importance of Prevention and Control Strategy

Integrated community measures against SARS-COV 2 are important to control the spread of infection and disease. Several countries have taken different public health measures to reduce or delay the community transmission of COVID-19. Since there is no vaccine and specific anti-viral drugs so far, public health measures is considered as an effective tools to mitigate the impact of the virus in the community. The strategy includes community involvement where individuals develop the potentiality to prevent themselves from COVID-19 contacts as well as involvement of community based approach where planners, employers and community organizers can take strategy to protect vulnerable groups and the community against COVID-19 infection. Interestingly when the Wuhan incident started was the time for Chinese Lunar Holiday. This particular time has a high travelling rate among the homebound Chinese citizens who eventually came in close contact that facilitated the spread of transmission. Hence China focused on the conventional technique of public health outbreak response like isolation, quarantine, social distancing and community containment⁸. While controlling an outbreak of COVID-19 which is caused by an enveloped virus and predominantly transmitted through respiratory route, public health measures are

out most important which includes hand hygiene, respiratory etiquette, social distancing, environment cleaning and securing safe handling of food. Moreover, an infection prevention control measure is similarly important for health care providers⁹.

Hand Hygiene

Hand is an important vehicle to transfer SARS-COV2. Frequent touching of mouth, nose or eye could recklessly bring the virus in contact with the mucosal surfaces. Hence the most important measure to control the spread of COVID-19 infection is frequent hand wash with soap and water or with an alcohol based hand sanitizer. If hands are not visibly dirty they should preferably have washed with alcohol based sanitizer for 20 to 30 seconds¹⁰. However, if hands are visibly dirty they must wash with soap and water for 40 to 60 seconds with an appropriate protocol¹¹. Hand wash can protect a person from contracting this highly infectious virus and subsequent spread to others.

Indirect modes of transmission of COVID-19 are though fomites. Surfaces may get contaminated with infected hands or spills from respiratory droplets. An appropriate disinfection technique with 1.0% hypochlorite solution or 70.0% alcohol can limit the spread of infection.

Use of Mask

Prohibition of generalized use of masks by WHO is often criticized by some researchers. However using a surgical mask for COVID-19 patients, their care giver and health care workers (HCW) is well excepted⁹. Using an N95 mask or respirators is only restricted to any procedures like bronchoscopy, tracheostomy, manual ventilation, collection of respiratory samples or during other aerosol generating procedures⁹.

Hospital Environment

In a health care set-up, infection prevention control measures should be strictly followed. In the hospital there should be a system of well-maintained triage which is a first point of contact of suspected patient where patients are separated according case definition. It is mandatory for all suspects in the triage to wear surgical mask. The attending physicians should have PPE with surgical mask, however in case of any aerosol generating procedure and during sample collection a complete PPE is mandatory to

protect health care worker from SARS-COV2 infection.

Droplet Precaution

Droplet precaution refers to prevention of large droplet transmission of respiratory viruses. As air-droplet seldom crosses beyond 1 meter, performing any work on patient near within 1 meter, all health care workers must wear medical/ surgical mask along with face shield or goggles to protect eye from accidental spitting from patients¹².

Contact Precaution

Contact precaution prevents direct or indirect transmission from contaminated surface, fomites or instruments. Personal protective equipment (PPE) includes masks, gloves, gown, and goggles are necessary to prevent infection to health care workers. Dedicated instruments (stethoscope, thermometer) should be used for each patient however in case of sharing each instruments must be disinfected with alcohol or hypochlorite solution. Health care worker must avoid touching their mouth, nose or eye, frequent hand wash and a proper training on donning and doffing of PPE is very important to prevent spread of infection among them¹².

Airborne Precaution

For obtaining airborne precaution it is obligatory for the health care workers to use complete PPE with N95 respirators during performing procedure that generates aerosol. Preferably it should be done in a negative air pressure room and should contain single person per room¹². Covid19 virus has thought to be transmitted by aerosol. However, this is a new virus. It is still under investigation.

Institutional Safeguard

Apart from this health care set-up, during a pandemic attack institutional safeguard against COVID-19 infection is also important. Workplace are kept safe by promoting and facilitating hand hygiene, keeping distance of at least 1 meter, keep work surface and frequently touch sites like door knobs, telephone or computer key pad disinfected, prohibiting gathering by encouraging video conference, assess the risk of business travel, securing an isolated room for persons who suddenly get sick during work and encourage employee to get self-quarantine when having mild symptoms of COVID-19.

Standard Measures

In such situation when COVID-19 becomes major threat to public health, the institutional gathering is discouraged. In relation to that schools must have plans to ensure frequent hand hygiene for the students, ease accessible and available hand sanitizer and soap, frequent monitoring of hand wash practice, cough etiquette and holding program to sensitize the students about waste disposal. Classes should be rescheduled to avoid interclass gathering, if unavoidable hold classes in open air and well ventilated space, avoid food sharing, ensure safe health of persons work in the school cafeteria, advice students and staffs to stay home in self quarantine if suffer from mild symptoms of COVID-19.

Conclusion

A strong public health infrastructure is mandatory which can think proactively for future preparedness, development and research against emerging and reemerging infectious diseases. Investment for capacity building is crucial for rapid response through regional and global scientific and political collaboration to fight against future pandemic like COVID-19¹³.

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