



MANAGEMENT AND DISPOSAL OF COVID-19 DEAD BODIES

Forensic Medicine

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ABSTRACT

Covid-19 is a viral disease with a high transmission risk. The number of deaths due to this disease has been continuously increasing, and transmission through dead bodies reported. Considering, India is the second-most populous country in the world; there will be high morbidity and mortality due to the disease. In the management and disposal of Covid-19 related deaths, one of the following protocols, i.e. PAN American Health Organisation guidelines, Ministry of Health and Family Welfare (MOHFW), W H O guidelines followed. None of the significant guidelines has taken into consideration the case report where two people infected from a dead body. It brought forth the need for having a set of guidelines which could be adopted and followed for proper handling and disposal of the dead bodies.

KEYWORDS

body packing, COVID-19, Dead body disposal

INTRODUCTION

The causative agent of COVID-19 acute respiratory disease is the 2019-nCoV, which primarily affects the respiratory system and hence has been named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (formerly called HCoV-19)(1). The disease labelled as a pandemic within three months of its first reported case, thus reinforcing rapid spread and global impact of this virus(2). SARS-CoV-2 remains viable in aerosols for a period of about 3 – 16 hours; and on plastic and steel up to 72 hours(3)(4). Recently the World Health Organisation mentioned the possibility of the virus spreading via airborne route, raising fear and concern all over the world(5). The most common pathway of human-to-human transmission, however, till now has been the contact of the mucosae with infectious respiratory droplets or fomite(6). Initially, it believed that dead bodies were not a transmission source(7). This claim was negated by the report of COVID-19 spread to a forensic medicine professional in Thailand in March 2020 and the report of forensic medicine doctor getting Covid-19 while doing an autopsy in Vishakhapatnam, India in June 2020(8)(9). Hence, it warrants the formulation of guidelines to break the transmission chain.

Formulating Guidelines

While developing the guidelines following should be taken into consideration:

- I. Advisable that only trained hospital staff to be involved in dead body management.
- II. Judicial usage of the scarce resources (due to pandemic)(10).
- III. Personal Protective Equipment (PPE) kit (fulfilling requirements set either by the Centre for Disease Control (CDC), WHO or Ministry of Health and Family Welfare, Government of India) use is necessary. However, it is challenging to wear, especially for non-medical staff who may underestimate its significance(11). Thus, multiple countries suggest limited or sessional use of PPE kits, duration of each session varying from 4-6 hours(12)(13).

Therefore:

1. Allocate a set number of the workforce involved in this work.
2. All allocated staff trained for PPE kit usage. Body wrapping and disinfection process with a complete mock drill under the supervision of concerned authorities. No one should be allowed to work before satisfactory completion of training.
3. Designated staff and their supervisor will directly report to a concerned nodal officer.

4. To minimize the chances of errors, staff provided with the checklist with clear stepwise instructions.
5. A separate route, for transporting dead bodies from COVID isolation to mortuary.
6. Exposure of any kind should bring into immediate attention of Nodal Officer.

For body bags, our specifications based on most commonly acceptable standards(14)(15).

The disinfectant chose as per government guidelines, 1% Sodium hypochlorite solution effective against coronavirus(16)(17).

COVID Patient Death Information Flow

The death rate amongst patients infected with Covid-19 is about 2-3 %(18). The percentage may seem low, but when countries with high populations considered, the numbers become staggering. Hence, an effective closed-loop communication system amongst the health care workers ensures active movement of the dead body with the least risk of infection spread.

Dead Body Handling (COVID-19 cases)

Safety of health care workers is of prime importance. A 'buddy system' should be followed for both donning and doffing of PPE to ensure there is no breach of personal protection(19). Minimum and only side to side movement of the body (avoiding bending of the body at the thoracic level which can result in aerosol generation) is recommended(7). Flowchart- 1 demonstrates working procedure for staff attending the dead body.

Flowchart-1 – Dead Body Handling

Staff should wear PPE kit as per Donning protocol.



Remove all catheters, Ryle's tube, endotracheal tube, drains etc from body.

- Keep in plastic bag with 1% sod hypochlorite.
- IV lines to be disposed into sharp containers.
- Puncture or therapeutic wounds should also be sealed using with cotton plugs or pads soaked in 1% Sod Hypochlorite solution and surgical tape.
- The outer surface of the plastic bag is to be cleaned with 1% Sod Hypochlorite solution.

All relevant orifices (mouth, nostrils) will be stuffed or closed with cotton plugs or pads soaked in 1% Sod Hypochlorite solution.

Remove all clothes from body and keep in biohazard bag and seal. Mop the outer surface of the bag with 1% Sodium Hypochlorite solution

Any leakage from the dead body during the body packing or removal process will be cleaned by the body disposal team by cleaning the floor with the appropriate disinfectant (1 % sodium hypochlorite solution) and leaving the cleaned area cordoned off for a period of 30 minutes.

Body Packing

Proper packing of a dead body is of paramount importance. Variations exist in all the major guidelines regarding this (WHO, CDC, MOHFW and ICMR). Unlike guidelines issued by the WHO where it suggested that body bags are not a must, the CDC and MOHFW recommended using single layer packing of a body bag, whereas Indian Council of Medical Research (ICMR) recommended body packed in two layers(7)(20). We, however, advise wrapping of the body in a triple layer system—each layer of packing interspersed with a layer of 1% sodium hypochlorite solution. Flowchart-2 depicts the triple layer packing protocol for effective packing of COVID-19 dead body.

Flowchart-2

Wrap the body with a single layer cloth sheet soaked in disinfectant (1% Sodium Hypochlorite) and then pack into a second layer with a plastic sheet.

Wipe the plastic wrapped dead body with 1% Sod Hypochlorite solution and put in a plastic body bag with zipper. The outside of the body bag should also be wiped with 1% sodium hypochlorite solution.

All used/soiled linen should be kept in biohazard bag and its outer surface be disinfected with 1% Sod Hypochlorite solution.

Dead body should be transferred to the specified vehicle with minimum movement and handling.

After handling and disposing the dead body, personal care should be taken by attending personnel according to standard protocols like removal of all PPE equipment at proper place and in proper manner

After transportation of body, transporting vehicle should be decontaminated with 1% Sod Hypochlorite.

Figure 1



Figure 1 - Body packing in Three layer :
(A)Layer I - packing the body in disinfectant (1% Sodium Hypochlorite) soaked cotton sheet, (B)Layer II - packing of layer I wrapped body in a plastic sheet and then wiping with disinfectant, (C)Layer III - packing of layer II wrapped body in a body bag,

(D)Wiping of outer surface of body bag with disinfectant.

Additional Instructions

- The bedsheets, mattresses and bed rails can be a source of a droplet and fomite transmission(17)(21)(22).
- To avoid discarding beds, they should be adequately cleaned and sanitized along with cleaning and disinfection of high-touch surfaces in patient care areas (e.g., bed rails, carts, charts, bedside commodes)(23). Thus the use of disposable, waterproof covers for mattresses minimize body substance contamination and subsequent infection to other patients not only for Covid-19 but also for other infections(24)(25)(26).
- Swabs should be taken bi-weekly to check for COVID-19 presence from the stretchers used for transporting the bodies, cold storage cabinets and door handles along the entire route.

Workers involved in dead body management be provided with:

- Full medical coverage for themselves and their families
- Monetary incentive

Body Disposal

Grieving the loss of a loved one can be very stressful and may sometimes lead to making decisions which can hamper personal safety. Community transmission of COVID-19 due to funeral gathering in the United States was reported with similar reports of clusters of cases also from India when government guidelines and regulations are not followed(27)(28). Some precautions that should be followed are(29):

- Relatives are allowed to view deceased, one time before last rites by unzipping the face end of the body bag just outside Isolation Ward in a separate area with full precautions.
- Practice social distancing while arranging funerals and limiting attendance
- Avoid touching, hugging, or kissing the body of a deceased person who was confirmed or suspected COVID-19 patient.
- Wash hands with soap and water for 20 seconds after contact with the body and use hand sanitizer with at least 60% alcohol(30).

• Cremation is the preferred method for last rites with a body bag.

However, burial can also be done if body is buried six-ten feet deep and away from a water source. Tertiary care hospitals should install electric crematoriums in an appropriate location to allow easy and hassle free cremation for the grieving family members and to avoid a double impact on the environment.

The hospital administration should also provide:

1. Direct route of communication between hospital authorities and relatives of the COVID positive/suspected patient.
2. Counselling of patient's attendants, for testing and treatment modalities, precautions to be taken and to motivate for getting tested.
3. Information to grieving attendants for proper disposal of dead body, to prevent further spread of COVID-19,
4. Suggestions to local administration to designate a temporary cremation site for COVID-19 dead bodies.
5. Coordination with local law enforcement to ensure proper disposal of infected bodies.

Medico-legal considerations

Newer and technologically superior practices for autopsies in medico-legal cases to prevent transmission to autopsy related health workers, is a start. This requires understanding on the part of both the law enforcement, judiciary and the medical fraternity. Minimally invasive autopsy techniques should be employed in cases where autopsy cannot be avoided (like deaths during custody or media-sensitive cases).

Also, body identification is very important in these times, especially if we are proposing multi-layer packing of dead bodies for prevention against infection. Proper and clear labelling thus should be high on the priority list.

DISCUSSION

Our guidelines will bring forth questions like why only 3 layers and why not 4 or 5 and what is the justification for having a separate set of guidelines when all the major health authorities have issued such guidelines already.

No set of guidelines that are available today have talked about packing

the body in three separate layers. Most of them have laid emphasis on the use of body bag. Earlier, dead bodies were not considered an important or even a possible source of COVID-19 infection(7). Thus we believe that the guidelines that were formulated did not take into account the risk to people dealing with dead bodies of COVID-19 patients like mortuary workers or Forensic medicine doctors or coroners. The 3 layers which we have specified comprise of materials which are normally available for body disposal and the hospital will not have to procure anything extra for the same. This prevents any more burden on the already thinned out hospital resources in times of a pandemic. Many people defend and endorse just a single leak proof body bag packing. The problem with that method is that, there will always be a possibility of breach and exposure to the handlers. Adoption of the proposed system or guidelines will help decrease the risk of transmission phenomenally. People are known to violate or overlook simple body bag packaging due to religious beliefs as it is easy to do so but we believe that having three layers is going to discourage the possibility of people opening up body bags and mishandling dead bodies of COVID positive patients. In the end, this proposed set is a suggestion for the better protection of hospital workers at no extra cost, which is currently being implemented in our institution.

CONCLUSION

Following above mentioned set of guidelines, will ensure proper disposal and prevent transmission of the virus to healthcare personnel and subsequently the community. As healthcare community, we have to make efforts to tide over this time of crisis and emerge victorious against this invisible enemy.

Conflict of Interest: Authors declare no conflict of interest.

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