International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2020): 7.803

Embalming in COVID-Era

Bhumica Dang[1], Pradeep Bokariya[2], Jyoti Rohila[3], APS Batra[4]

[1]Assistant Professor, BPS GMC for women Khanpurkalan, Sonepat, Haryana, India
Email: *mclyfe88[at]gmail.com*

[2]Associate Professor, Department of Anatomy, Mahatma Gandhi Institute of Medical Sciences, SEVAGRAM, Wardha (Maharashtra), India
Email id: *pradeepbokariya[at]mgims.ac.in*

[3]Assistant Professor, Department of Anatomy, Dr. B. R. Ambedkar State Institute of Medical Sciences, Mohali, Punjab, India
E- mail: *jyotirohilla5671[at]gmail.com*

Professor& Head, BPS GMC for women Khanpurkalan, Sonepat, Haryana, India
Email: *apsbatra[at]yahoo.com*

Abstract: ***COVID-19 is a severe illness predominantly respiratory caused by SARS-COV19. Being a HG-3 (Human Grade -3) pathogen; specific precautions are must if the cadaveric dissection has to be continued. Embalming procedure is unavoidable in instances when a dead body has to be transported for last rites. Cadaveric dissection is irreplaceable without degrading the standard quality of education. Also; virtual dissection arrangement is too expensive and requires maintenance. Guidelines are important to be followed while deciding the suitability of the cadaver and even during and post embalming procedure. Following a COVID -19 appropriate behavior is important while accepting the body for embalming.***

Keywords: Embalming, COVID, precautions

1. Introduction

The corona virus disease 19 (COVID-19) has spread worldwide. The COVID outbreak in March has been announced as pandemic by World Health Organization (WHO). [1] Though Government of India in its "**Guidelines on Dead Body Management**" has clearly said that embalming should not be done yet sometimes we come across such inevitable circumstances when we have to think thrice in saying no to embalming. [2]

Cadaveric dissection and its importance to curriculum of anatomy can never be underestimated. It forms the foundation stone of MBBS curriculum and also used for surgical skill training and clinicians of various disciplines. Cadavers serve the purpose of research in surgical anatomy, histology and molecular research and even for bio-medical engineering for designing new devices [3]. Cadavers are important for procuring skeletons. Cadaveric dissection is important in development of fine motor skills in students that help them further themselves in medical career.[4] Cadaveric dissection had been important also in respect to inculcating the value of ethics and humanity.[5] The embalmed human cadavers are important to teach students "fabric of human body". [6]

Due to all these facts the body donation program in the pandemic era has been questionable and debatable issue. Many anatomists are accepting the preregistered medically screened donors. In the current scenario it is obligatory on part of anatomists to be more vigilant about COVID-19 guidelines before accepting the body through voluntary donation or for transportation purpose. The donors / diseased should be screened for the COVID- 19 infection by different methods, such as history for symptoms suggestive of COVID-19 infection, epidemiological screening for travel and potential exposures, and nasopharyngeal l / oropharyngeal / bronchoalveolar lavage samples for laboratory testingofCOVID-19. [7]

Emerging issues with respect to safety in COVID pandemic

SARS-COV2; the virus which causes COVID 19 is a hazard group 3 (HG3) pathogen like HIV and TB. The virus spreads mainly;

1) Between people who are in close contact
2) Through respiratory droplets and aerosols
3) Through splashes of contaminated fluids.[8]

Certain medical schools across USA and Europe as Cleveland Clinic, University of Aberden, Cambridge, University of Dundee, Royal college of Surgeons in Ireland, University of Edinburg, University of Glasgow, University of Oxford and other medical colleges including JIPMER, Pondicherry have suspended body donation programs. However University of Munich had made a policy to screen all donations by COVID -19. [9]

Criteria to be implemented for accepting dead bodies

Unlike the previous outbreaks of Ebola, SARS COVID 19 has seen an unprecedented extent and therefore new criteria need to be formulated in light of these. The dead bodies may be accepted if

If patient tested for COVID 19 and found to be negative [9]
Body handlers i.e. any individual involved in physical handling of human remains are at perennial risk of contracting COVID. So; precautions must be taken by the individuals. Apart from these precautions we also suggest that proper training of staff of Anatomy department pertaining to handling of instruments and body should be

Licensed Under Creative Commons Attribution CC BY

done. All the staff should be sensitized with virus and its spread through relevant documents and related videos. The staff should be made aware with standard Donning and Doffing process. They should also be trained to use infection prevention and control practices while handling the bodies.

In addition to it the aggregation of relatives should be strictly prohibited. More number of people and more the chances of spread. Personnel with age more than 60 and immunocompromised should not be allowed to handle the body [9].

1) Standard PPE along with heavy duty gloves, face shields, face Filter Protections (FFP2 / FFP3 / N95) and shoe protection should be made compulsory.
2) Use non-biodegradable (250 microns thick) double body bags for carrying the body.
3) Disinfect the instruments after use and dispose of Personal protective equipment (PPE) by incineration. (10)
4) Disinfect the body bag and strict protection against aerosols produced during splashing of contaminated body fluids. [9]
5) Surface disinfection of the cadaver is notorious for generation of splashes and aerosols. Avoid using compressed air and water under pressure for cleaning the body which may cause splashing and re-aerosolize the infectious virus. Gently irrigate the body and cavities as nasal and oral with 1% sodium hypochlorite. (9)

Embalming fluids are able to inactivate SARS-COV-2 in temperature dependent and time dependent manner. Any request to view the body after embalming must be denied so as to prevent re-infection of the cadaver. [9]

The precautions to be taken can be divided into three groups on the basis of severity of risk involved which is shown in Table 1.

During embalming; procedures to be followed

1) Wear PPE for examination for ascertaining the fitness of the body for anatomical embalming [9].

Transmission based precautions: PPE for the care of the deceased during the COVID-19 pandemic [10].

Table 1: Categorization of Risks

	Low–risk procedures as admitting the deceased, preparing for viewing, releasing the deceased	Medium Risk procedures as rolling deceased, undressing deceased, significant handling	High Risk procedures that lead to aerosol production
Disposable gloves	Yes	Yes	Yes
Disposable plastic apron	Yes	Yes	Yes
Disposable gown	No	No	Yes
Fluid resistant surgical mask	Yes	No	No
Filtering face piece respirator	No	FFP2 or FFP3	FFP3
Disposable eye protection	Yes	Yes	yes
Shoe protection	Yes	Yes	Yes

Aerosol generation is unlikely but be mindful of infectious body fluids so 1% sodium hypochlorite solution must for disposal for emergency use to deal with mishaps.

Embalming instruments be placed in a tray with disinfectant solution with 1% formalin, 1% phenol, 1% ethanol and 0.5 % sodium hypochlorite solution for 8hrs before washing and storing them. All the body fluids are infectious so they must be disinfected with 0.5% sodium hypochlorite solution before draining. During bathing of the cadaver utmost precautions to be followed as water under pressure produces aerosols. [11]

Points to Ponder Post Embalming

PPE kits are must to be worn by the personnel while cleaning and disposing of the biomedical waste. Disposal of body fluids by adding 0.5% sodium hypochlorite solution. Dispose the invasive medical devices as catheters, nasogastric tubes, tracheostomy tubes and needles, scalpels in a puncture –proof and closable container. Embalming facility must have proper ventilation with airflow of at least 160l / s / person and a controlled direction of air-flow. All the air should be exhausted to outside directly or through a high-efficiency particulate air(HEPA) filter. This guideline to be followed till the embalming room is thoroughly cleaned.

2. Conclusion

Risks of infection from human cadaver though less but adequate protection from aerosols is must. And introduction of specific COVID appropriate behavior for embalming may be the way forward for mitigating the risk posed by SARS COV2.

References

[1] AST. American Society of Transplantation. COVID-19 (Coronavirus): FAQs for Organ Donation and Transplantation, 11 March 2020 ed., Mt. Laurel, NJ: American Society Transplantation; 2020.p.8.
[2] HCO O. Ministry of health and family welfare. COVID-19: GUIDELINES ON DEAD BODY MANAGEMENT
[3] Singal A, Bansal A, Chaudhary P. Cadaverless anatomy: darkness in the times of pandemic COVID-19. Morphologie 2020; 104: 147-50.
[4] Krähenbühl SM, Čvančara P, Stieglitz T, Bonvin R, Michetti M, Flahaut M, Durand S, Deghayli L, Applegate LA, Raffoul W. Return of the cadaver. Key role of anatomic dissection for plastic surgery resident training. *Medicine.* 2017; 96:e7528.doi:10.1097/MD.0000000000007528.
[5] D Souza A, Kotian SR, Pandey AK, Rao P, Kalthur SG. Cadaver as a first teacher: A module to learn the ethics and values of cadaveric dissection. *J Taibah Univ Med Sci.* 2020; 15:94–101.
[6] Gregory SR, Cole TR. The changing role of dissection in medical education. *JAMA.* 2002; 287:1180–1181.doi:10.1001/jama.287.9.1180-JMS0306-4-1.

Licensed Under Creative Commons Attribution CC BY

[7] Ravi KS, Dead body management in times of COVID-19 and its potential impact on the availability of cadavers for medical education in India. Anatomical Sciences Education April 2020https://www.researchgate.net/publication/34058501.
[8] Osborn et al., Briefing on COVID-19: Autopsy practices relating to possible cases of COVID-19, The Royal College of Pathologists, London, February 2020.
[9] Rajasekar SSSN, Kumar VD. The Cadaver Conundrum: Sourcing and Anatomical embalming of human dead bodies by Medical schools during and after COVID-19 Pandemic: Review and Recommendations. SN Compre. Clin. Med.
[10] ICRC-General guidance for the management of the dead ICRC Forensic unit.
[11] Hoffman PN, Healing TD. The infection hazards of human cadavers: Guide to infection control in the healthcare setting.

Licensed Under Creative Commons Attribution CC BY