



Spanish Anatomical Society

Technical report

Managing of COVID 19 (SARS-CoV-2) corpses in bodies
donation programs

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1. Recipients

People involved in bodies donation programs for teaching and research.

2. Justification

The current crisis produced by the appearance of the pandemic caused by the COVID 19 virus, led the Spanish Government to decree the state of alarm on March 14, 2020. This condition forced the suspension of face-to-face educational activity and, subsequently, the closure of universities with dire implications not only for teaching but for research.

Taken into account that, with the exception of the Centre for the donation of bodies and dissection rooms at the Complutense University of Madrid, all donation programs are managed by university departments or medical schools, the impact that this closure has had on the donation process has been absolute and endangers activities of such importance as teaching health science students, continuing training for medical specialists as well as the research carried out with material from donated bodies.

It is important to highlight that the commitment acquired with the donor, once he has expressed his will to donate his body after his death, constitutes a contract between the two parts, for which reason we are forced to fulfil it under any circumstance.

On the other hand, we must bear in mind that COVID 19 (SARS-CoV-2) is here to stay; This implies that we will continue to receive bodies that have suffered this pathology (diagnosed or not) so it is decisive to know how to act in these cases without making excesses in our considerations.

“Pneumonia due to the new coronavirus, or SARS-CoV-2, emerged at the end of 2019 in the city of Wuhan, in the Chinese province of Hubei, being declared by the WHO a Public Health Emergency of International Importance on January 30, 2020. Due to its similarity to other coronaviruses, it is thought that it is transmitted mainly through respiratory secretions, either by direct contact, by the emission of drops of more than 5 microns or, in specific procedures that generate them,

through aerosols of these secretions. . Furthermore, the presence of the virus in urine and faeces has been demonstrated, although the transmissibility through them is not clear ... The corpses of people who died from COVID-19 should be considered as Group II corpses as established in Decree 2263. / 1974, of July 20, by which the Mortuary Sanitary Police Regulation is approved. This classification would correspond to group III corpse according to the Consensus Guide on Mortuary Health approved by the Public Health Commission in July 2018. However, since the corpse may constitute a biological risk, some additional measures are proposed to those considered for Group III corpses treatment, based on existing information and internationally applicable recommendations”⁽¹⁾

These lines are a literal extract of the technical document published by the Ministry of Health in March of this year and contain essential information to understand the way in which we must deal with the use of COVID 19 bodies in the process of donating bodies to teaching and research. Indeed, these are group III corpses with some considerations and, according to the referred Consensus Guide on Mortuary Health⁽²⁾, Group III is considered to be those that do not present the risks included in Group I (Respiratory anthrax , potentially communicable diseases, with known or unknown origin, that can be transmitted from person to person and pose a relevant risk to public health, viral haemorrhagic fevers -for arbovirus, arenavirus, bunyavirus, filovirus, flavivirus, hantavirus and others-, as well as unknown origin haemorrhagic fevers, Q fever, pneumonic plague, smallpox, human transmissible spongiform Encephalopathy) or those included in Group II (radiological risk).

This statement is supported by the fact that to inform the competent health authority of the existence of positive COVID 19 bodies is not required which is an essential requirement in cases of bodies belonging to Groups I and II.

3. Infection with COVID-19 dead bodies

Most of the around the world published documents in relation to the management of dead bodies, are focused on the infection probability in the immediately after the death moments or during invasive procedures of virus reservoirs such as autopsy. For these cases, the preventive procedures established are the same as in the work with confirmed and controlled patients.

Despite there being no instructions directed to the body donation process; health authorities around the world have mentioned the non-existent capacity of contagion of COVID 19 through a corpse. There are many expressions collected in various technical documents that indicate the possibility of working with these bodies without any contagion possibility.

According to the European Center for Disease Control and Prevention ⁽³⁾, there is no evidence of transmission of SARS-VOC-2 through dead people. The potential risk of transmission related to the manipulation of COVID 19 bodies is considered low and, in any case, would be related to;

- direct contact with human remains or body fluids where the virus is present
- direct contact with fomites.

Very explicitly, the World Health Organization recalls that except in cases of haemorrhagic fevers (such as Ebola or Marburg fevers) and cholera, cadavers are not generally infectious. Only the lungs of patients with pandemic influenza virus, if mishandled during an autopsy, can be infectious. Apart from this, the corpses do not transmit the disease. It is a widespread belief that the corpses belonging to people who have died of a contagious disease should be cremated; but this is not true, incineration is a cultural issue and of available resources ⁽⁴⁾

It is well known that the virus can remain on certain surfaces for a few days ⁽⁵⁾ and therefore it can also do so on the dead body, something that must be taken into account when receiving and subsequently handling it.

Another risk that must be considered during the manipulation of the corpse is the possibility of aerosols or drops of body fluids being generated. It has also been estimated that the virus can remain in them, hence the importance of using the recommended preventive equipment. This fact is what has also decided the Spanish authorities to the mandatory double bag in the transport of the bodies and not the possible capacity that contact with the body can lead to contagion since it is known that the virus has no capacity to survive in dead organisms ⁽⁶⁾

Fortunately, when it comes to chemicals that inactivate the virus, there is a full consensus that the most effective disinfectants are:

Sodium hypochlorite (bleach) (e.g. 1,000 ppm (0.1%) for general surface disinfection and 10,000 ppm (1%) for cleaning up blood spills

Ethanol 62-71%

Hydrogen peroxide 0.5%

Phenolic and quaternary ammonium compounds used according to the manufacturer's recommendations.

Other biocide agents such as 0.05-0.2% benzalkonium chloride or 0.02% chlorhexidine digluconate may be less effective.

In addition to the selection of the product to be used, it is also important to choose the time (eg 10min) taking care that there is no greater dilution than desired and that the products used are in the useful period of use ⁽⁷⁾

4. Procedure

El procedimiento de recepción y embalsamamiento de cuerpos COVID 19 que aquí se contempla está basado en el publicado por la Sociedad Anatómica Española en el documento técnico “Acta de Madrid”⁽⁸⁾. Únicamente se han incorporado las modificaciones necesarias para asegurar una manipulación segura del cuerpo por parte del personal. En este procedimiento, los espacios donde se realice el procedimiento, así como todas las superficies y material en contacto con el cuerpo, toman especial relevancia.

The following procedure for receiving and embalming COVID 19 bodies is based on that published by the Spanish Anatomical Society in the technical document "Madrid Act" ⁽⁸⁾. Necessary modifications have been incorporated to ensure safe handling of the body. In this procedure, the spaces where the procedure is performed, as well as all the surfaces and material in contact with it, take special relevance.

We must be prepared with the required personal protective equipment:

1. Neoprene apron.
2. PVC or nitrile gloves (always double glove) as appropriate, to protect from mechanical, chemical and biological risk.
3. S5 class II rubber or polymer safety boots with non-slip sole and safety toe.
4. Small mask for organic vapours and integral frame safety glasses, which protects from splashes and projections.

O well:

5. 3M brand face mask, 6800 series, model 6899T, with 3M CE0086-A2B2E2K2P3R filter, which protects the entire face, including the eyes.
6. This type of mask, due to its design, also protects us from possible splashes. In the event that we use FFP2 masks, we must bear in mind that other mucosa (such as the eye) must also be protected.
7. It is recommended the use of disposable plastic sleeves that will prevent the gown sleeves from being contaminated by rubbing with the liquids from the body cleaning. The clothing used in no case should be reused. After use it must be washed with very hot water and disinfectant (in compliance

with the regulations, this cleaning must be done by specialized external companies)

A la llegada del cuerpo al centro lo primero que haremos será comprobar que los datos del fallecido corresponden con los del donante y que la documentación que recibimos es la correcta. Durante el periodo de cuarentena es habitual que falte documentación o que en lugar de originales nos dejen fotocopias. A pesar de que podemos disponer de la Historia clínica la positividad a COVID 19 no siempre figura entre las pruebas realizadas aunque, todos los cuerpos, deben tratarse como posibles portadores.

Once the body has arrived we will check that the deceased's data correspond to that of the donor and that the received documentation is correct. During this quarantine period has been common missing or photocopied instead of originals. Although the clinical history could be available, COVID 19 positivity does not always figure among the tests performed therefore all bodies should be treated as possible carriers.

Usually the bodies will be received with a double shroud and / or an incineration box. If they arrive with the box, it must be removed by the funeral company, avoiding the storage in our facilities of material that has been in contact with the body. As mentioned, the double shroud is an implemented measure to reduce the contamination risk through liquids during transportation. The removal of this double shroud is a process that must be done with the utmost care, leaving all the elements it contains inside (identifying sanitary labels, clothing, cannulas, tracks, hair shaved residues ...)

Serology test. Subsequently, and after disinfecting the supraclavicular region with 96° alcohol, 10 c.c. of blood from the subclavian vein are extracted. The (heparinized) vial is located in the corresponding container and is urgently sent to the laboratory for a serological analysis (HIV and hepatitis B / C). The kits to obtain the samples are supplied by the analysis laboratory.

Taking of a sample can be considered to carry out a COVID19 control test, but its result will not modify the procedure in any case. Some of these tests are not 100% effective and, in any case, it would be more interesting to know the state

the body condition after a period of time in which the body could already be used for teaching or research activities.

The donor's clothing, dressings and body cannulas will be removed and all body length will be shaved. All waste material included in the double shroud will be placed in a suitable bag for disposal and incineration. The ministerial order SND / 271/2020 (9) published by the government on March 19, 2020 establishes differences between the management of home waste where are living COVID 19 patients and those from hospitals, residences, etc. ... where the same type of patients are found. This difference is based on the high viral load that is assumed to those residues coming from places where there is a high number of infected people. In the first case, the waste must be introduced in up to 3 bags to finally be deposited in the gray domestic garbage container (in no case is it allowed to deposit them in recyclable garbage containers); in the second, they must be treated as infectious waste and removed in the specific containers.

Inspection of the skin surface for possible bedsores or other types of lesions, confirming that the corpse is adequate to initiate one or the other procedure. In this period of crisis, in which the bodies' delivery has been delayed due to the high number of services that the funeral services have had to face, it is common to find that decomposition has begun. These circumstances must be labelled.

Then, the body will be cleaned with disinfecting soap, commercial bleach (in a ratio of 1/5) and a surgical brush intensively, proceeding to dry if it is going to be frozen. The disinfecting mixture will be left to act for at least 10 minutes. The oral cavity must be disinfected as well as the nostrils using a syringe.

4.1. Cold preservation

The body will be transferred from the autopsy table, once conveniently bagged in a Galga 700 PVC bag, dry and bagged, after due registration and identification, using the stretcher / hydraulic crane to the freezing chamber (-20°C), and it will be deposited in the tray of the corresponding rack. Workers should remove the first glove before leaving the body preparation room to avoid contact of other surfaces with the external glove. In the event that the outer glove has deteriorated, the first glove must also be replaced.

Changing room and PPE for access to the freezing chamber:

1. Work clothes for cold
2. Neoprene apron
3. Cold resistance gloves for works in the cold store. It includes mechanical resistance to cutting and puncture, chemical and biological resistance.
4. S5 class II rubber or polymer safety boots with non-slip sole and safety toe.
5. Integral frame safety glasses, which protects from splashes and projections.
6. Outside the injection room the use of a mask (preferably FFP2) is still mandatory

4.2 Conservation by fixation. Embalment

The following aspects should be carefully checked before carrying out the procedure:

1. Start the ventilation / aspiration system.
2. At least two technicians are present throughout the process.
3. The phone works for possible emergencies.
4. The injection pump works properly
5. The embalming solution is prepared and suitable for use. For this, it is necessary to have stirred the content so that the mixture is homogeneous. The embalming mixture contains phenolic compounds that inactivate the virus ⁽⁷⁾
6. The instruments are prepared and conveniently located.
7. The liquid waste drum is connected to the drain tube of the injection table.
8. Some padded support is available.

Costumes and PPE:

1. 3M brand face mask, 6800 series, model 6899T, with 3M CE0086-A2B2E2K2P3R filter, which protects the entire face, including the eyes.
2. Neoprene apron.
3. DOUBLE GLOVE. PVC gloves that protect for mechanical, chemical and biological risk.

4. S5 class II rubber or polymer safety boots with non-slip sole and safety toe cap

Arterial cannulation. The femoral artery is cannulated, preferably in the middle third of the femoral canal of the left thigh, proceeding as stated in the technical document "Madrid Act" ⁽⁸⁾.

Once the embalming process is completed, a second wash is carried out, with water and commercial bleach in the same proportion that in the initial cleaning, to remove any traces of embalming liquid. The body is left on the table supported by its nape, heels and gluteal region in cotton rolls for 48 hours, simply covered by a sheet.

When the injection is finished, the instruments used must be sorted, the embalming table cleaned as well as other utensils, and the room floor using the recommended disinfectants ⁽⁷⁾. The room should be clean and tidy for a new embalming process.

The workers will remain with the same Personal Protective Equipment during the cleaning. These should be disinfected (with ethanol or commercial bleach) once the entire process has been completed.

Storage: Storage is only carried out if the serological tests are negative. In the event that the serological analysis confirms a contaminating virus (HIV or Hepatitis B / C), the body is eliminated by the indicated route depending on the preserving method. On the contrary, if the test has been negative, after 48 hours in which it is verified that the injection has been correct, without the appearance of necrotic areas, the corpse is placed inside a transparent polyethylene bag that is knotted with a resistant rope to the used chemicals.

Once the body has been identified and registered, the final storage is carried out. Any clinical information of interest on the label will be collected, so that the technicians know the information. If the body wears a prosthesis, it will be identified with a colour label for a quick identification.

Bagged in a Gauge 700 PVC bag, placed in a storage chamber, at a temperature of 10.6°C, which has a homologated vapour extraction system.

For this transfer, the workers, who must wear cold clothing, will use a stretcher / hydraulic crane, which is located at the height of the injection table, allowing the body to pass to it and then lift it to the station storage on the corresponding shelf.

Before moving the body to the refrigeration chamber, or in the event that for any reason we must leave the injection room during the process, we must make sure to remove the outer glove.

5. Conclusions

Bodies from confirmed or suspected COVID-19 patients do not have to be excluded from body donation programs for teaching and research. The personal protective equipment used in these circumstances does not differ from that used in bodies from deceased donors of infectious contagious diseases.

6. Referencias

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