

The trauma and acute care surgeon in the COVID-19 pandemic era

O cirurgião de trauma e emergência na era da pandemia de COVID-19

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ABSTRACT

The World Health Organization recognized in March 2020 the existence of a pandemic for the new coronavirus that appeared in China, in late 2019, and whose disease was named COVID-19. In this context, the SBAIT (Brazilian Society of Integrated Care for Traumatized Patients) conducted a survey with 219 trauma and emergency surgeons regarding the availability of personal protective equipment (PPE) and the role of the surgeon in this pandemic by means of an electronic survey. It was observed that surgeons have been acting under inadequate conditions, with a lack of basic supplies as well as more specific equipment such as N95 masks and facial shields for the care of potential victims who may be contaminated. The latter increases the risk of contamination of professionals, resulting in potential losses in the working teams. Immediate measures must be taken to guarantee access to safety equipment throughout the country, since all trauma victims and/or patients with emergency surgical conditions must be treated as potential carriers of COVID-19.

Keywords: Pandemics. Coronavirus. Personal Protective Equipment . Coronavirus Infections.

INTRODUCTION

The World Health Organization recognized in March 2020 the existence of a pandemic for the new coronavirus that appeared in China in late 2019, and whose disease was named COVID-19. It presents an expressive capacity of transmission and propagation, in a world population without natural defenses against this disease, and results in considerable mortality especially in the elderly and people with chronic diseases. Furthermore, it threatens the collapse of the healthcare system, with the sudden overload of hospitals and intensive care units, consuming all essential equipment for the treatment of these patients, such as mechanical ventilators, and also leading to the lack of personal protective equipment (PPE) for the professionals who care for these patients, further increasing the contamination of the health personnel, contributing to the collapse of the entire system.

Also, it should be highlighted that other serious problems such as trauma and other surgical emergencies continue to arrive at the emergency departments in

Brazil. In these scenarios, surgeons are taking care of these patients who arrive, in parallel with the admission of patients with COVID-19, and with difficulties in protecting themselves with appropriate PPE.

The lack of equipment as well as the overload of exposure to COVID-19, mean that health professionals are considered a highly vulnerable population. Several papers have shown that thousands of health professionals have already been infected, and hundreds have died from the disease. According to the New York Times, of the more than 40,000 confirmed cases in Spain, approximately 5,400 are health professionals (14%), these numbers are also observed in other countries with high rates of infection¹. By the beginning of March, China reported more than 3,300 infected health care workers and at least 22 deaths^{2,3}. Protective guidelines are more essential than ever for emergency professionals and surgeons when considering the risks of contamination from invasive procedures.

In this context, SBAIT conducted a survey with trauma and acute care surgeons regarding the availability of PPE and the role of the surgeon in this pandemic.

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METHODS

This is a prospective questionnaire using the SurveyMonkey tool (<http://www.surveymonkey.com>)⁴ and distributed electronically (list of emails and WhatsApp groups) to SBAIT members, composed of trauma and acute care surgeons as well as non-members, totaling approximately 1,500 forms sent. The questionnaire consisted of 14 questions, 13 of which were objective and one that the surgeon could write observations relevant to the topic. The questions addressed the kind of facility and region of work, personal safety situation and which kind of PPE were available to handle trauma patients, considering both, patients with and without the diagnosis of COVID-19, and who have potentially surgical diseases. The data obtained were automatically transferred to an Excel file, to be analyzed.

Participation in the questionnaire was voluntary and spontaneous, and all responses were anonymous. This type of survey does not require ethics committee approval.

RESULTS

Of the 1,500 forms sent, 219 responses were obtained (14.6%). The majority of the surgeons come from the South and Southeast regions of Brazil (54.3%) as shown in Figure 1. Of these, 82% work in the emergency room and/or trauma bay, with only a small portion reporting having had contact with known COVID-19 positive patients.

When assessing the type of institution where the professionals work, it was observed that most of them had professional activities in municipal public hospitals (22.8%), public state hospitals (63.9%) or social health organizations (OSS) (17.3%), and it was also noted that more than 50% of the surgeons also work in private hospitals (Figure 2).

Regarding the personal safety of surgeons, in the current COVID-19 pandemic, it can be seen that 15.5% of them answered that they consider themselves safe to work, while 49.7% consider themselves partially safe and 32.4% do not consider themselves safe to provide care for potentially infected patients (Figure 3).

Regarding personal protective equipment (PPE), it was highlighted that none of the items mentioned as

those considered ideal for the care of trauma victims reached 100% availability among the 219 respondents. Even basic materials such as gloves (93.6%), surgical mask (89%) surgical caps (86.3%), which in theory should be available in 100% of the services were not available in some locations (Figure 4).

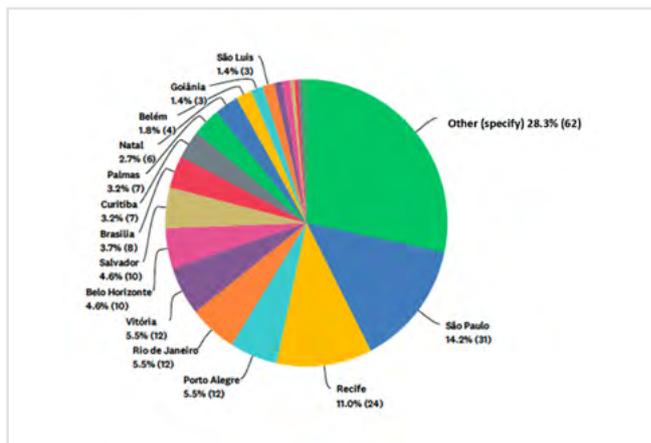


Figure 1. Main surgeons' workplaces.

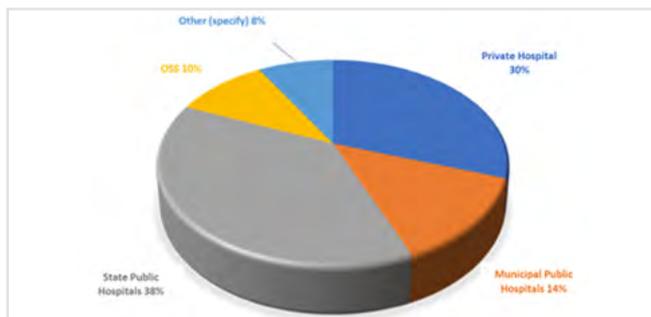


Figure 2. Type of hospital where surgeons work.

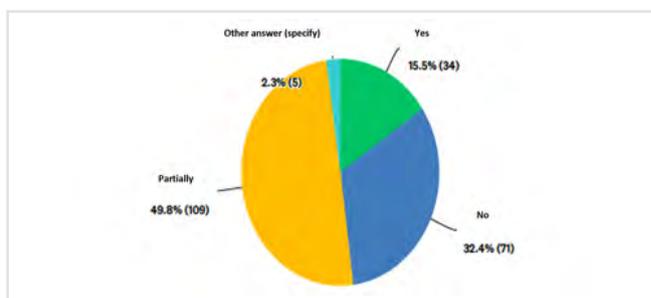


Figure 3. Perception of safety during care for trauma victims during the pandemic.

When asked about what type of safety equipment the surgeon used while in the hospital, 115 (52.5%) reported using a conventional surgical mask, with 30% reported not using any type of personal protective device. As for the types of protection used

to care for patients without suspected COVID-19, it was observed that 43.8% of surgeons use conventional surgical masks even in non-suspected cases, and 36.5% of them reported the use of an N95 mask (Figure 5). When asked about the use of PPE for surgical procedures in patients without suspected virus infection, the answers were practically the same as those obtained for the care of victims without clinical suspicion.

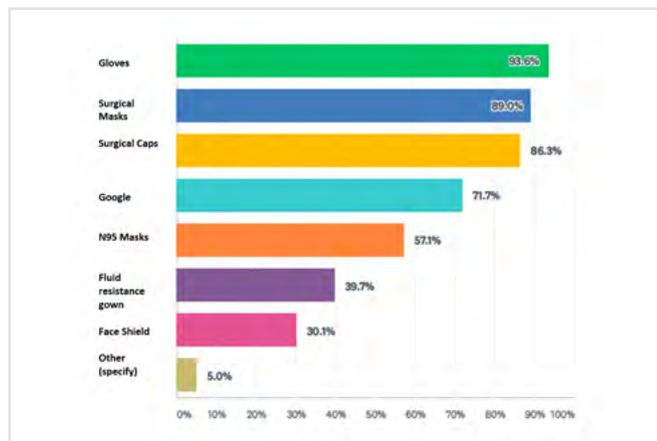


Figure 4. Materials available for the care of trauma victims (the surgeon should check all available items).

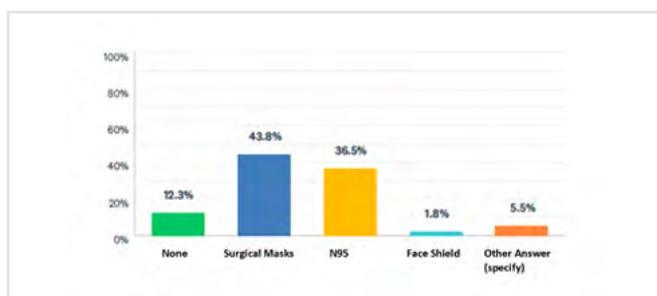


Figure 5. Types of personal safety equipment used against patients who are not suspected of COVID-19.

With regards to laparoscopic surgery and the potential risk of spreading the virus through pneumoperitoneum, it was observed that the majority of surgeons (52.9%) are not performing such procedures at the present time, 23.7% have refrained from performing such procedures only in suspected and/or confirmed cases and 16.4% of surgeons have maintained the usual indications (Figure 6).

Regarding indications and surgical management of an emergency case (traumatic or not), it was observed that 81 surgeons (36.9%) maintain their usual indications

and approaches without changes. However, 51.6% of them have performed thoracic CT scan always and/or in selected cases and 7.7% have opted for non-operative treatment whenever possible (Figure 7).

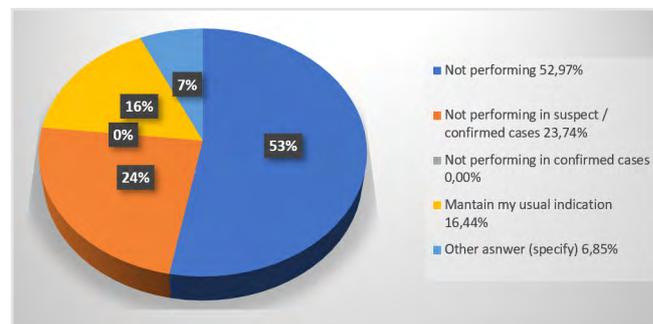


Figure 6. Current indications for laparoscopic procedures during the pandemic.

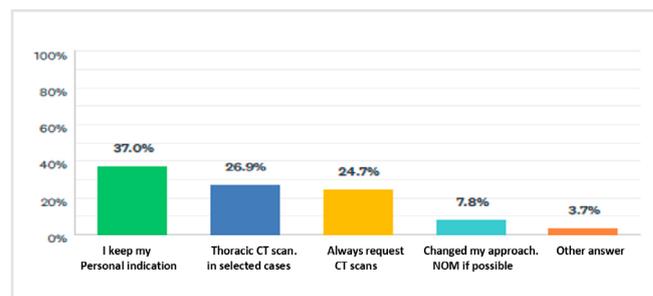


Figure 7. Current indications upon surgical cases (traumatic or not) among trauma and acute care surgeons.

Considering that obtaining a definitive airway is part of the day-to-day tasks of this group of professionals, we evaluated the type of material available to perform oral-tracheal intubation, and the majority of surgeons (55.7%) reported having the face shield and fan filter (42%) available. Unfortunately, only a small number of professionals' report having the video laryngoscope for intubation available (Figure 8).

As for the PPE available for these surgeons to perform an operative procedure, it was observed that less than half of them had protective equipment as recommended by Anvisa (National Health Surveillance Agency) (46.5%). Seventy-nine surgeons (36.1%) report having less than recommended and 14.6% did not know about such recommendations.

In this study 63% of surgeons reported having difficulties in obtaining PPE in their hospitals. Finally, 53.4% (116) of surgeons did not know any health professional who has been infected by the virus.

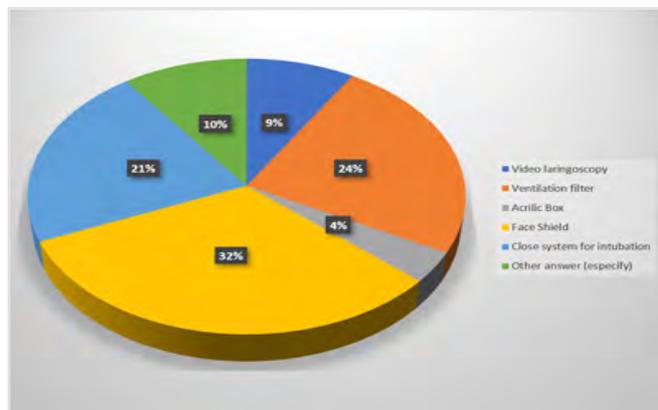


Figure 8. Materials available for orotracheal intubation by trauma and acute care surgeons.

DISCUSSION

It is well known that injuries resulting from trauma represent the main cause of death in the population under 45 years of age worldwide⁵. It is estimated that about 6 million people die each year as a result of such injuries. This number corresponds to about 10% of deaths in the world, killing more than malaria, tuberculosis and HIV combined^{6,7}.

As of April 15, 2020, according to the Coronavirus Resource Center of Johns Hopkins University, more than 2 million people worldwide and more than 30,000 people in Brazil, have been infected with COVID-19, causing the death of more than 140,000 people around the world⁸.

In Brazil today, the vast majority of trauma victims are admitted to public hospitals and OSS, where approximately 62% of surgeons who responded to the current survey carry out their activities. By April 12, 2020 the Brazilian Medical Association (AMB) had received 3,031 complaints about the lack of PPE for patient care. At the present time, both the public and private sector are suffering from the lack of materials and equipment, placing healthcare professionals at risk. Of the 826 institutions consulted by AMB, 95% were experiencing supply problems⁹.

The scarcity of equipment reported to AMB was related to the availability of N95 masks (87%), followed by goggles or face shields (70%) and fluid resistant gowns (66%). The degree of exposure and risk is such that 26% of the respondents reported lack of gloves and 35% of

alcohol-based hand sanitizers. Such data corroborate the findings of the present study as shown in Figure 4.

Assistance to trauma victims follows well-established protocols such as Advanced Trauma Life Support®(ATLS), which assumes that professionals who assist such victims must be wearing appropriated PPE, such as face shields, goggles, fluid resistant gowns and gloves, and such recommendations have been made for decades by the American College of Surgeons and its Committee on Trauma¹⁰. Unfortunately, there are few public and even academic hospitals in Brazil that follow these rules correctly, placing professionals at increased risk of being exposed to personal contamination by body fluids, secretions and more recently to aerosol from the airways of potentially contaminated patients.

ANVISA recently published a technical note that determines that health care professionals who perform procedures less than 1 meter away from suspected or confirmed patients for coronavirus infection should follow the following guidelines: hand hygiene, goggles and/or face shields, surgical masks, which must be replaced by N95/PFF2 mask when performing aerosol-generating procedures, gloves and fluid resistant gowns^{11,12}.

Unfortunately, the present study shows that among the 219 surgeons who responded to the survey, 32 of them were not even aware of ANVISA's recommendations, clearly demonstrating that educational actions by medical societies and health authorities, must be optimized in order to make all health care professionals aware of their guidelines and recommendations.

In a recent electronic publication, Machado Jr recommends for all trauma centers that surgeons have ample access to PPE as well as institutional policies for airway management¹³. In the same way, Lima et al, presented recommendations for emergency surgery during the pandemic, pointing out that the use of protective equipment combined with adequate surgical technique and correct surgical planning represent the best way to reduce contamination rates among health professionals¹⁴.

Finally when the surgeons were asked about the indications for laparoscopic access for emergency surgeries, there was a tendency to avoid or even not use them, in agreement with the current recommendations of several medical societies due to the risk of

contamination of the team by aerosol emission from pneumoperitoneum^{15,16}.

The lack of protective equipment has been affecting surgeons around the world. In the present study, we can say that more than 80% of surgeons report feeling partially or totally unsafe for care. In the UK, Rimmer reports that a third of surgeons (32.5% of a total of 1978 responses) pointed to problems with the supply of protective equipment in their hospitals. More than half of the surveyed surgeons claimed to have had problems to have PPE supplies in their hospitals throughout the last 30 days¹⁷.

Unfortunately, we can expect casualties to increase among the workforce in hospitals, due to both the contamination of surgeons working in the front lines as well as due to the stress resulting from the daily exposure to cases not only of trauma but also of those infected with COVID-19. Lai et al presented the psychological effects among 1257 health professionals who worked in Wuhan during the peak of the pandemic and identified high rates of depression (50.4%), anxiety (44.6%), insomnia (34%) and stress (71.5%) among respondents¹⁸.

The current pandemic was unexpected and unimaginable for many until 3 months ago. Nonetheless, it has exposed several weaknesses in the healthcare systems around the world, which were not prepared for such an event. Alerts by scientific¹⁹ and non-scientific²⁰ communities have been made in the last decade, but to no avail.

The concern about the loss of contaminated health professionals who will be temporarily out of action and some who will not survive is a huge burden for the society and health systems. The protection of these professionals must be a priority at this time, as well as making information available to everyone.

This study has limitations, which, despite being national in scope, did not reach all states and medical services equally. In addition, the proportion of responses may not be of statistical power to support it since the response rate was only 14.6%. Despite this limitation, it was considered a priority due to the need for a rapid assessment of the situation in the country, and for recommendations to be proposed in a timely manner. Importantly, this is the first survey conducted in Brazil with this focus during the current pandemic.

SBAIT published recommendations for surgeons in its media channels last month, but it is believed that communication should still be expanded. In times of greatest crisis, the communication process becomes essential for us to protect more lives²¹.

In conclusion, the trauma and acute care surgeons are in a situation of fragility and risk during the current pandemic, attending traumatized and critical ill patients in most cases without the proper PPE, exposing themselves to contamination. The dissemination of information that can protect surgeons is key in this moment of crisis throughout the health system in Brazil and the world.

R E S U M O

A Organização Mundial de Saúde reconheceu a partir de março de 2020 a existência de uma pandemia do novo coronavírus que surgiu na China no final de 2019, e cuja doença foi denominada COVID-19. Neste contexto, a SBAIT (Sociedade Brasileira de Atendimento Integrado ao Traumatizado) realizou pesquisa com 219 cirurgiões de Trauma e de Urgências e Emergências a respeito de disponibilidade de equipamentos de proteção individual (EPI) e do papel do cirurgião nesta pandemia, por meio de formulário eletrônico. Observou-se que os cirurgiões vêm atuando em condições inadequadas, com falta de insumos básicos assim como equipamentos mais específicos, como máscaras N95 e protetores faciais, para a atenção de potenciais vítimas que estejam contaminadas. Isso eleva o risco de contaminação dos profissionais e causa decorrentes baixas na força de trabalho. Medidas imediatas devem ser adotadas para garantir o acesso aos equipamentos de segurança em todo país uma vez que, todos os pacientes vítimas de trauma e/ou portadores de doenças cirúrgicas de urgência devem ser tratados como potenciais portadores do COVID-19.

Palavras chave: *Pandemia. Coronavírus. Equipamento de Proteção Individual. Infecções por Coronavírus.*

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