NURSING-RESPIRATORY THERAPIST AND OPERATION ROOM TECHNICIANS ROLES IN INFECTION PRECAUTIONS DURING ANESTHESIA; REVIEW

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Abstract:
In the intraoperative setting, there is a risk of clinically significant microbial cross-transmission, which poses a hazard to the safety of the patient. A growing body of research has demonstrated that contamination can occur in the anesthesia work area, which includes the anesthesia medical work cart, stopcocks, laryngeal masks and laryngoscope blades, touchscreens, and keyboards, as well as on the hands of providers. This contamination can lead to transmissions, healthcare-associated infections, and an increased risk of patient mortality. By coming into close contact with blood and respiratory secretions, those who work in the field of anesthesia run the danger of contracting occupational infections. There is also the possibility that they will be exposed to bacteria through the airborne or droplet route.

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DOI: 10.53555/ecb/2022.11.4.033

Introduction:

The provision of anesthesia that is both safe and effective to patients who are undergoing surgical operations or other invasive treatments is essential to the modern health care system. It is possible that patients are at their most vulnerable situation when they are under the influence of anesthesia since they are dependent on the anesthesia team to give them with treatment that is free of any adverse effects. It is anticipated that the patient would be prevented from becoming infected with a health care-associated infection (HAI) by the utilization of infection prevention methods that are appropriate [1]. Since the members of the anesthesia team have direct contact with the patient's blood and respiratory system, they may also be at risk of contracting a healthcare-associated infection (HAI). In a similar vein, effective adherence to infection control strategies ought to lessen the likelihood of occupational exposure and illness among the members of the anesthetic team [1].

It has been seen that infections connected with medical treatment that involve anesthesia can be passed on from a health care worker to a patient, from a patient to another patient, and from a patient to the anesthesia provider. The development of bacterial meningitis in five women who had undergone intrapartum spinal anesthesia is described in a paper that was published not too long ago. The anesthesiologist was the one who transmitted the infection to the patient. As a result of various breaches in the delivery of parenteral anesthetic medications, there have been several accounts of patients obtaining viral hepatitis from other patients. Occupational infections have been transmitted through the contact route, as was the case with herpetic whitlow, as well as through the respiratory route, as was the case during the outbreak of severe acute respiratory syndrome (SARS) in Toronto, Canada [2,3].

General anesthesia, regional anesthesia, and local anesthesia are some of the several types of anesthesia that may be administered. In recent years, the job of the anesthetist has become progressively broadened to encompass the administration of other medicines, such as those used for conscious sedation or pharmaceuticals that alleviate pain. Historically, the anesthesia team has been responsible for providing services in the operating rooms of acute care hospitals. However, in recent years, their responsibilities have grown to include ambulatory care centers, diagnostic, treatment, and procedure areas, pain management practices, and critical care units at hospitals. The highest possible quality of care for the prevention of infection has become more difficult to adhere to as a result of this new development. The quality of care for infection prevention and the administrative monitoring of this care should stay the same regardless of the environment in which the health care is provided or the level of the provider [4].

Review:

During the month of December 2019, the first instance of the coronavirus disease 2019 (COVID-19) was documented in Wuhan, which is the capital city of the Hubei Province in China. The pneumonia that was caused by the unknown pathogen was first documented. The coronaviruses are a category of viruses that are enclosed and have a positive single-stranded RNA structure [5]. The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the name of the coronavirus that is responsible for the COVID-19 virus. However, previous experience with SARS-CoV in 2003 suggests that there is a possibility of airborne spread in a relatively closed area. This occurs when individuals are exposed to high concentrations of aerosols for an extended period of time, most commonly after tracheal intubation [5]. SARS-CoV-2 is primarily transmitted through respiratory droplets and through direct contact between individuals. The signs and symptoms of COVID-19 are comparable to those of other upper respiratory infections, including fever, cough, shortness of breath, and lack of energy. On the other hand, the symptoms may not be readily identifiable, particularly in immunocompromised individuals and elderly people. The World Health Organization (WHO) declared COVID-19 a public health emergency of worldwide concern on January 30, 2020. This designation indicates that the virus has a significant influence on the economy of the whole world. The World Health Organization (WHO) proclaimed COVID-19 to be a pandemic on March 11, 2020 [6]. A COVID-19 pandemic is inching closer and closer to becoming a reality as the number of identified cases continues to rise. Due to the limited amount of information that is currently available on the biology and transmission of this virus, it is impossible to estimate the mortality rate at this early stage in the epidemic scenario. In the early stages of fatality estimates, moderate cases are frequently excluded, and it is not taken into account that some infected people may pass away later on.

On March 2, 2020, members of the Ministry of Health (MOH) in the Kingdom of Saudi Arabia (KSA) made the formal announcement that they

had discovered the first instance of COVID-19 infections. By the 9th of March in the year 2020, the number of cases had increased to twenty, and the government made the decision to cancel all social activities, as well as to close educational institutions and government offices, in order to combat the spread of the sickness. The Kingdom of Saudi Arabia (KSA) made the announcement on March 21, 2020, that it would be suspending all planes, buses, and trains to and from the KSA as well as between its main cities. Moreover, the government imposed restrictions on any monies that were brought into the Kingdom from other countries. In addition to this, it imposed a public curfew that began at 19:00 and lasted until 06:00 every day, and it was increased to 15:00 and lasted until 06:00 in every city [7]. The presence of a diverse team and the necessity for high-transmission risk procedures, such as airway examination, make operating rooms (ORs) potential risk environments for the transmission of airborne diseases. This increases the likelihood that airborne illnesses will be passed from one patient to another. The COVID-19 epidemic has created a number of additional issues, including the increased demand for resources on a worldwide scale, the exhaustion of staff members, the increased risk of transmission, and the increased burden on our health care systems. Due to the fact that they are in close proximity to the patient's airway, anesthesiologists are exposed to a significant risk of airborne transmission. Surgical anesthesia for COVID-19 patients should be performed according to a procedure-specific strategy in order to assist decrease the risk of cross-infections occurring inside the hospital facilities [7].

One sort of disease transmission is known as direct contact, which occurs when two people come into direct physical touch with one another. It is possible for germs to be transferred physically from an infected or colonized individual to a vulnerable host during professional practice. This can happen either from a child to a health care provider or from a health care provider to a kid. Some examples of this include venous cannulation, laryngoscopy, burn treatment, and suctioning secretions. It is possible for medical professionals who operate in operating rooms to be exposed to the possibility of skin contamination caused by bodily fluids. Because of the possibility that medical professionals might be exposed to patients who have diseases that have not been identified, this is a matter that is of the utmost worry. In particular, the hepatitis B virus (HBV), the hepatitis C virus (HCV), and the human immunodeficiency virus (HIV) are concerned individuals. There is a very tiny amount of blood that is required for the transmission of the hepatitis B virus, which is a highly contagious blood virus. A significant number of anesthesiologists and other workers employed in the medical field experience skin contamination as a result of blood and saliva. During the course of seven consecutive days, one research looked at 270 different anesthetic methods. The skin of 65 anesthesiologists was contaminated with the blood of 35 patients, which represents 14% of the total number of episodes. Sixty-one percent of the contamination events that took place during venous cannulation were twenty-eight. Five of the sixty-five anesthesiologists who had been exposed to blood had wounds on the skin of their hands. This is eight percent of the total. It is important to note that seroconversion of health care providers has been documented following skin contamination by infected blood from HIV carriers and HBV infection following blood splashing into the eyes of health care workers. This finding sheds light on the significance of these two infections. Herpes simplex, pediculosis, and scabies are some of the illnesses that are spread by direct contact the most commonly according to research [8]. When it comes to safeguarding oneself against exposures of this kind, even during common operations like beginning an intravenous line or performing laryngoscopy, these findings illustrate why it is so vital to wash our hands thoroughly and to wear protective gear like gloves and eye protection on a regular basis.

The phrase "Indirect Contact" refers to the process by which bacteria are transferred from a source, whether it be an inanimate or living creature, to a vulnerable host through the use of a vehicle, such as an intermediate object, that is contaminated with bodily fluids. This type of contact can also occur when medical professionals touch contaminated monitoring or other patient care devices (such as blood pressure cuffs, stethoscopes, electrocardiographic cables, and ventilation systems [respirators, corrugated tubes, Y pieces, valves]) that are used with multiple children without being properly cleaned or disinfected in between each use [9]. This type of contact can occur with or without the use of gloves.

When it comes to the transmission of blood-borne infections, the most efficient method is the percutaneous contamination that occurs as a consequence of an accident involving cutting or

piercing. Evidence shows that this is the primary route of infection for HIV, HBV, and HCV, particularly in cases when injuries are produced by hollow-bore needles that were used to draw blood or place an intravenous line. This method has been responsible for the transmission of over twenty more blood-borne viruses, including those that are responsible for herpes, malaria, and TB. It is estimated that a percutaneous exposure to blood or bodily fluids from an HIV-positive individual has a 0.3% chance of infectious disease transmission. The chance of hepatitis B virus infection following an injury caused by a cutting or piercing equipment that is infected with hepatitis B antigen is roughly 37% among health care practitioners who do not possess protective antibodies. In the event of hepatitis C virus infection, the risk is 1.8% (0%-7%). Staff members working in anesthesia who do not possess HBV protective antibodies are at a significant risk of contracting the illness [10]. These infection rates highlight the necessity of using "safe" needles and the necessity of advocating for the adoption of "needleless" devices, despite the fact that these systems are substantially more expensive.

Conclusion:

Based on these findings, it appears that the doctor has the ability to conduct preventative strategies that are associated with anesthesia or analgesia that is administered through the spinal cord in order to eliminate the possibility of infection. Decontaminating the skin with the right antiseptic, using sterile gloves and drapes, and performing aseptic technique are all techniques that fall under this category. Because there is an increasing body of evidence suggesting that droplet transmission of oropharyngeal flora can occur during procedures that puncture the spinal column, the Guidelines for Isolation Precautions published by the Centers for Disease Control and Prevention (CDC) recommend that personnel who are inserting a catheter or injecting material into the spinal canal or subdural space wear a surgical mask. Diseases such as TB, measles, and chickenpox are examples of those that may be spread through the airborne environment. Vaccines that are successful should make it possible for the majority of professionals to be immune to measles and varicella. For patients who are currently experiencing these active infections, surgery should be postponed. In the event that the case cannot be postponed, the air handling system in the operating room need to ideally have a negative pressure in comparison to the hallway atmosphere. Patients who are currently experiencing active TB should have a bacterial filter installed on the breathing circuit of the anesthetic machine, as was described earlier.

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