بسم الله الرحمن الرحيم

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شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

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Introduction

Neonatal nursing is a field sub-specialty where nurses work with neonates who have a variety of medical ailments, such as premature, congenital disabilities, cardiac malformations, dangerous infections, and other morphological or functional problems. Medical literature defines the first month of life as the neonatal period. Neonatal Intensive Care Unit (NICU) nursing typically encompasses care for neonates with complications proximately after birth; however, that isn't to say that it excludes care for neonates experiencing chronic long-term problems following their birth. NICU nurses will typically care for neonates from the time of their birth until they're discharged from the hospital ***(Kumar, Kumar & Basu, 2019).***

The neonatal period (birth to 1 month) is a time of extensive and ongoing system transition from uterine environment to external world, this includes the initial period after birth which is referred to as the perinatal period. A neonate is also called a newborn. It is a time when changes are very rapid. Many critical events can occur in this period as feeding patterns are established, bonding between parents and neonate begin, the risk for infections that may become more serious are

higher and may birth or congenital defects are first noted ***(Escobedo et al., 2019).***

Annually more than12 million neonates are born prematurely that include 10-12percent of births worldwide. Some of these neonates undergo suctioning procedures that is one of the basic steps in caring and maintaining air way. Even this procedure maintains upper air way permeability, it is not a safe procedure and may lead to short and long term detrimental effects. Suctioning is one of the most frequent interventions in nursing and in fact it is the most important responsibility of nurses in NICUs ***(Pirlotte et al., 2019).***

Neonates, especially premature ones, are subjected to diagnostic and therapeutic procedures which are essential for their survival. One of the most routine procedures done in NICU is nasal, pharyngeal and Endotracheal Tube (ETT) Suctioning. About 63% of the procedures done on neonates are suctioning but often no releasing intervention was done for this repeated painful procedure ***(Kumar, 2020).***

Clearing the airways of secretions in neonates facilitates the transition from intrauterine to postnatal life by the prevention of aspiration of material into the lungs.

A degree of stimulation necessary to initiate respiration is also provided. Oronasopharyngeal suction of airway secretions in neonates after delivery is a common practice worldwide. However, this method can cause adverse effects, including bradycardia and apnea **(Edwards, 2020).**

Endotracheal Tube suctioning is an essential component of care for the intubated neonates. Suctioning of an artificial airway clears the airway of secretions, potentially improving oxygenation and ventilation. The American Association of Respiratory Care (AARC) states that "successful suctioning of an intubated neonates improves air exchange and breath sounds, decreases the Peak Inspiratory pressure (PIP), decreases airway resistance, increases dynamic compliance, increases Tidal Volume (TV) improves Arterial Blood Gas (ABG) value, improves oxygen saturation, and removes secretions" **(Jain, Jain & Sareen, 2018).**

In the NICU, suctioning is a common procedure performed by nurses and respiratory therapists. However, it is not a benign procedure. Associated risks include cardiac dysrhythmias, hypoxemia, atelectasis, bronchospasm, infection, trauma to the mucosal linings and cilia of the airway and

Increased Intracranial Pressure (IICP). ETT suctioning of neonates with small ETTs that have internal diameters of <4 mm may cause an immediate decrease in dynamic compliance and expired tidal volume regardless of lung pathology. Despite the risks associated with suctioning, failure to suction when needed can result in a plugged ETT and the trauma of reintubation, atelectasis, and decreased oxygenation and ventilation. Optimal hydration and adequate warming and humidification of inspired gas maintain the normal consistency of secretions, reducing the risk of a plugged ETT **(Edzards et al., 2018).**

Suctioning must be performed only when clinically indicated, based on neonate assessment. Clinical signs include changes in respiratory rate and pattern, secretions audible with respirations, coarse and/ or decreased breath sounds upon auscultation of the chest, oxygen desaturations, increased PaCO2, decreased PaO2, bradycardia, neonates restlessness, and changes in the proximal airway pressure waveform on the ventilator. Once the need for suctioning has been established, the neonate should be adequately prepared for the procedure to prevent hypoxemia. The need for preoxygenation should be assessed, considering previous response to care, handling, and suctioning ***(Ringer et al., 2020).***

Catheter size should not exceed one-half the diameter of the ETT. The catheter should be inserted so that the catheter tip ends at the tip of the ETT and does not touch the carina. Negative pressure should not exceed 100 mmHg and should be applied only during withdrawal of the catheter for no more than 15 seconds. The number of catheter passes should be kept to the minimum necessary and should not exceed three. Neonates should be given rest breaks between catheter passes to allow oxygen levels to return to baseline. Sterile normal saline should not be instilled during ETT suctioning. Small amounts of sterile normal saline may be used after suctioning to cleanse the catheter only in closed, inline suction systems **(Fisk, 2018).**

Significance of study

Suctioning that is one of the basic steps in caring and maintain airway. But there is many nurse performed suctioning very good but not biased on ideal knowledge and not based on evidence based and other nurse have good knowledge but not performed it in ideal way. So this study assess the nurse's performance in order to determine the possible gaps, defects and work necessary to overcome those defects. As each nurse is dealing with many infants, nurses,

knowledge and practices will have great effect and will be reflected on high number of infants. The statistics from Ain Shams University hospitals the admission of neonates at 2019 was 1118. So, this study will design in a trial to assess nurses, knowledge and practice regarding suctioning procedure.

Aim of the Study

This aim of the study was to assess nurse's performance regarding suctioning in neonatal intensive care unit at Ain Shams University.

Research questions:

- What is the nurses' knowledge about suctioning?
- What is the current nurse practice regarding suctioning?
- Is there a relation between nurses' knowledge and practices about Suctioning?

Part I: Neonatal Suctioning

Neonatal Intensive Care Unit (NICU) is a hospital unit containing a variety of sophisticated mechanical devices and special equipment for the management and care of premature and seriously ill neonates. The unit is staffed by a team of nurses and neonatologists who are highly trained in the pathophysiology of the neonates. NICU is designated for care of critically ill premature and full-term neonates **(Browen et al., 2017).**

Neonates in the NICU routinely require Mechanical Ventilator (MV), which may be non- invasive through an interface connecting the individual to the ventilator or invasive (the most common choice in NICUs) through an inserted ETT connecting the individual to the ventilator. The presence of the ETT leads to increased mucus production as a result of mild irritation generated in the airway mucosa, and it also impairs the ability to mobilize and expectorate secretions by suppressing the appropriate mucociliary mechanism and impairing the cough reflex, thus requiring frequent ETS to prevent secretion accumulation and airway obstruction. **(Välitalo et al., 2016).**

Suctioning is a component of bronchial hygiene therapy and MV that involves the mechanical aspiration of pulmonary secretions from neonate's artificial airway by insertion of a sterile catheter into the endotracheal or tracheostomy tube to prevent its obstruction **(Tusman et al., 2013).**

Purposes of suctioning technique, **i**t promotes the cough reflex to help in maintaining a clear airway. It removes respiratory secretions and maintains optimum ventilation and oxygenation in neonate who are unable to get rid of these secretions independently. It is needed to maintain the patency and integrity of the artificial air way**.** The indications of suctioning technique are the need to maintain the patency and integrity of the artificial airway, in case of accumulated pulmonary secretions and in the presence of coarse crackles over the trachea is strong indicator of retained pulmonary secretions. Increased peak inspiratory pressure or decreased tidal volume. Deterioration of oxygen saturation and/or arterial blood gases values, Visible secretions in the airway. Neonate's inability to generate an effective spontaneous cough. Acute respiratory distress and Radiological changes consist with retention of pulmonary secretions **(World Health Organization, 2017).**

A large number of premature neonates require prolonged ventilatory support. In order to provide this support an artificial airway must be inserted. This airway can be established in one of two ways, either with an ETT or through the means of a tracheotomy tube. Regardless of which method is used, the neonate's upper airway is bypassed, thus reducing the neonate's ability to clear secretions spontaneously. Additionally, the presence of the tube may lead to an increase in sputum production. For these reasons' neonates with an artificial airway in place will require airway suctioning **(Neumann et al., 2014).**

Suctioning shouldn't be undertaken as a routine procedure on a fixed frequency. The decision to suction the artificial airway should be based on the results of the physical assessment of the neonate. It must be remembered that infrequent suctioning as well as inadequate suction when needed also carries substantial complications such as "hypoxia, pneumonia, atelectasis, infection, increased airway pressures retention of carbon dioxide, ventilation perfusion mismatch, blockage of the ETT, retention of sputum, and neonate's discomfort. The following criteria have been identified in the literature as appropriate indicators for performing endotracheal suctioning. Diminished breath sounds (breath sounds that are

less prominent or more difficult to auscultate) or absent breath sounds are a possible indicator of an obstructed artificial airway. Dyspnea, as indicated by tachypnea (an increased respiratory rate) or the use of accessory muscles. Due to the wide age and developmental variations in respiratory rate, tachypnea is difficult to quantify. Rather, the registered nurse must carefully observe the neonates and note a sustained increase in respiratory rate from baseline. Moderate narrowing of the airway diameter can cause a disproportionately large increase in airway resistance. An increased airway resistance manifests itself as an increase in airway pressure in the neonate who is being mechanically ventilated, resulting in a high-pressure alarm from the ventilator **(Liu et al., 2014).**

Visible secretions in the artificial airway, visible secretions are those secretions that have migrated from the lower airways into the endotracheal or tracheotomy tube. These Secretions may represent excess sputum production or transudate from the pulmonary circulation. Have both identified visible secretions in the airway as an indication for ETS**.** Gurgling or coarse breath sounds or rhonchi, are an indication of secretions in the larger airway passages. Rhonchi are a rattling sound noted upon auscultation that resembles snoring. Finer airway sounds, or rales, indicate secretions in the

small distal airway passages; these secretions most likely are not accessible through ETS. Audible breath sounds in the non-ventilated neonate with spontaneous respirations are similar to rhonchi and indication of secretion **(Myers et al., 2017).**

Decreased oxygen saturation levels, as the artificial airway becomes obstructed, the passage of air is significantly reduced due to the reduction of the internal diameter of the artificial airway. If untreated, this leads to a rise in oxygen consumption, which ultimately leads to an oxygen desaturation. Several authors cite decreased oxygen saturation as an indication for performing ETS. A continued decrease in the oxygen saturation level may indicate worsening hypoxemia **(Lakshminrusimha et al., 2015).**

Complications of Neonatal Suctioning:

Although clearing the artificial airway through the use of mechanical suction is a vital aspect in caring for the neonate with an artificial airway, suctioning the artificial airway is not without risk. The following complications associated with ETS have been identified in the literature hypoxemia, atelectasis, trauma, pneumothorax, increased intracranial pressure, infection, and the use of normal saline bolus instillation **(Hadian et al., 2013).**