Nursing Research Proposal: Decreasing MRSA by Compliant Hand Hygiene and Glove Use

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The Neonatal Intensive Care Unit is full of vulnerable infants. The preterm infants have immature immune systems that hinder their ability to fight infections. The tendency to start antibiotics while waiting for lab results is typical for most NICUs. The preterm infants in the NICU will have many septic work-ups and have antibiotics started pending culture results several times during their hospital stay. The overuse of antibiotics can lead to antimicrobial resistance—in particular MRSA (Johnson, 2012). Methicillin-resistant Staphylococcus aureus is spread primarily through direct person to person contact and most often by the hands of healthcare workers. It can remain in the environment for long periods of time on linen, clothing and dust (Association for Professionals in Infection Control and Epidemiology, Inc., n.d.). This infection is resistant to the many antibiotics and is usually treated with vancomycin. Once this infection finds its way into the NICU strict hand hygiene and contact precautions must be followed. The infants need to be isolated and cohorted in an attempt to control the spread of this infection.

Problem Statement

The Centers for Disease Control and Prevention (CDC, 2002) have produced guidelines that many hospitals use when forming their own policies on hand hygiene. They recommend 30-60 second hand scrubbing but they say studies have shown that most healthcare workers scrub less than 15 seconds. The simple act of hand washing and wearing gloves can make a significant difference in the spread of infection. The problem, in many cases, is that the hand hygiene policies are not being followed correctly. The medical staff do not always wear gloves correctly and hand washing is not as it should be. This inappropriate hand hygiene can lead to the spread of hospital acquired infections and one of the most serious is MRSA. This infection needs to be
eliminated. If it cannot be eliminated, it needs to be decreased. Hand hygiene and contact precaution policies need to have absolute compliance. Infants should be isolated or cohorted whenever possible. There should not be a mix of infected and non-infected patients in one nurse’s assignment. Intensive Care units can become extremely busy and the nurses may have mixed assignments and they may also cut corners when it comes to hand hygiene compliance. Some units have started adding the use of gloves for any patient contact. If treating all patients as if they are on contact precautions will help decrease the spread of MRSA then this practice should be the norm in all NICUs. This research proposal is intended to determine if there is a correlation between strict hand hygiene and the wearing of gloves and the decrease in MRSA.

**Hypothesis**

Neonatal Intensive Care Units want to prevent and control the spread of health care associated infections. It is known that infections can be spread by the hands of healthcare workers and visitors (CDC, 2002). The hypothesis for this research proposal is that the wearing of gloves along with compliant hand hygiene will decrease the incidence of MRSA. If this hypothesis is supported the nurses will improve their practice and the patients in the NICU will go home sooner, healthier and with less cost to the patient and the facility.

**Nursing Theory**

Dorothea Orem’s Self Care Deficit theory is based on her belief that health can be achieved if the person has knowledge and the resources to perform self-care activities (Current Nursing, 2012). Nursing has to intervene if the patient does not have this. The nursing interventions will maintain, restore, and preserve the health of the person (Libster, 2008). The infants in NICU are unable to perform self-care. This care is left to the medical staff and
families. They are entrusted to protect these helpless patients and this research is intended to improve on this protection. Exposing the infants to infection is a danger to them. They cannot tell the nurses, doctors or visitors to wash their hands or to clean the equipment before it touches them. These patients depend on others to ensure their well-being. The medical staff also has to educate the parents of these infants. They will need guidance on how to do wound care, how to feed an infant with cleft lip or palate, how to change an ostomy bag, how to suction a tracheostomy, how to perform CPR, and many other nursing skills that will be required for their infant’s home care. Nursing personnel in hospitals, schools and clinics, along with the families of these special needs infants, will have to continue to provide total care until they can do it themselves (Green, 2012).

**Review of the Literature**

Nurses are regularly faced with situations where they know that something needs to be changed or improved on. The practice of nursing is changing constantly as the healthcare needs of our communities change. Improving technology changes the way we do things as well. As nurses go about their normal work days, they may see an area that they know they can improve on. They may be concerned about their infection rates, the use of restraints, pain control or a way a procedure is done. Nurses want the best quality care for their patients and this care should be evidence based. The nursing practice evolved from evidence based knowledge and that has come from experience, trial and error, and most importantly, research (Nieswiadomy, 2012). To begin a research proposal there first has to be a literature review of the problem being considered for the study. This will tell us what is already known about this problem. We need this existing knowledge to build the future care on (Nieswiadomy, 2012). This review will help the researcher determine what aspect of the problem to study. There may be different angles not
NURSING RESEARCH PROPOSAL: DECREASING MRSA BY

considered before that will become apparent with the review of past literature. These studies set out to gain knowledge about a certain topic or problem. They may solve the problem through this research or they may discover that more work is needed (Levy & Ellis, 2006). For this proposal, it will also be necessary to know the previous MRSA infection rates for the NICU in order to determine if there is a decrease with compliant hand hygiene and the use of gloves.

Many studies dealing with healthcare-associated infection were found during the literature review. Nosocomial infections are one the major causes of morbidity in the NICU (Polak, Ringler, & Daugherty, n.d.). Capriotti (2003) stated that the hands of healthcare workers often become colonized with MRSA after contact with an infected patient. MRSA is then spread by these healthcare workers from patient to patient due to non-compliant hand hygiene. There have been many studies done that have determined that hand washing is the key to the stopping the spread of infection. One study by Cohen, Saiman, Cimiotti and Larson (2003) found that hand washing and the use of gloves by nurses were suboptimal. They found that only 22.8% of touches on neonates were with clean or gloved hands. They also found that nurses would wear gloves but they did not wash their hands before putting them on. Another study found that even when gloves were worn, the nurses often did not change gloves when going from a contaminated procedure to a clean one (Chau, Thompson, Twinn, Lee, & Pang, 2010).

Another study by Picheansathian, Pearson, and Suchaxaya (2008) found that when doing invasive procedures nurses would wash their hands more thoroughly, but when in a hurry, they did not. Alarmingly, they also found that after an education program on hand hygiene, there was not a decrease in the infection rates. Most of these studies mentioned the “Hawthorne effect” being a concern. The nurses knew they were being observed so they were more compliant
during the study but went back to suboptimal hand washing when no longer being observed which is why the infection rates did not decrease.

**Expected Outcomes**

The results of this research proposal will demonstrate whether the more compliant hand hygiene and the wearing of gloves will decrease the incidence of MRSA. The desired outcome would be a measurable decrease of MRSA cases in the Neonatal Intensive Care Unit. With the known fact that compliant hand hygiene can decrease the incidence of infection, it would be expected that medical staff and visitors would be diligent with hand hygiene when touching the vulnerable NICU patient. However, some of the studies reviewed, continued to have suboptimal hand hygiene and no decrease in infection occurrence was noted. If this research also has this result, then changes need to be made.

**Research Design**

This research proposal is looking for a cause-and-effect relationship between hand hygiene and the wearing of gloves with the incidence of MRSA. The research design that is the best fit is with quantitative research. With this design, generalizations can be applied beyond the NICU population and could include patients in the inpatient as well as outpatient settings (Nieswiadomy, 2012). The quantitative design begins with the hypothesis and relationships will be measured. There are objective and measurable results (Siegle, 2002). The NICU patient is unable to give any subjective data on their experience. The weekly screening of MRSA will provide numbers pertaining to who is positive and who is negative. These results would be compared to the incidence of MRSA prior to the conduction of this research. Hand hygiene and the wearing of gloves would be observed and compliance would be determined. The researcher
often knows the anticipated results and the research is designed to gather data to support this outcome.

**Experimental Design**

This research proposal concerns the population of the NICU and it would not be ethical to assign these patients into groups. They must remain an intact group. It is not acceptable to use appropriate hand hygiene with some infants but not with others. The best type of experimental design for this research proposal would be the quasi-experimental. According to Nieswiadomy (2012) with this type of design, there are no comparison groups. The study would involve intact groups. The research would be done with a naturally occurring population. The study would include observation of hand hygiene compliance over time and weekly MRSA surveillance. The existing hand hygiene policies would remain in place and compliance would be monitored. There is always a chance of the “Hawthorne effect” (Picheansathian et al., 2008) but with a known hand hygiene policy for staff and visitors in place, hopefully this effect will be kept to a minimum. The hand hygiene policy should always be followed regardless if someone is being observed or not.

**Sampling and the Recruitment of Subjects**

The subjects involved in this research proposal would be all of the NICU patients that are in the unit during the observation period. There are usually 35-45 patients in the NICU. One of the concerns for this population would be the admissions and discharges that will alter the population from time to time. There are transfer patients from outside facilities that may be MRSA positive at the time of admission. Unfortunately, there will not be a constant population to evaluate. The hypothesis for this study is to see if there a correlation between improved hand
NURSING RESEARCH PROPOSAL: DECREASING MRSA BY

hygiene and the wearing of gloves and the incidence of MRSA. This can only be done if all the patients in the NICU are included in the accessible population.

The other subjects in this study would be the medical staff and visitors. These subjects will be observed for their compliance on the hand hygiene policy and the wearing of gloves. There will be no constant with this group as well as staff and visitors will vary. The staff, visitors and the parents of the infants will be informed of the plan to attempt to decrease the spread of MRSA and that hand hygiene will be observed over time. These participants will be asked for their consent to be included in the study. The medical staff already has a hand hygiene policy in place, visitors are aware of the hand washing procedure and the infants are already screened weekly for MRSA. The only new procedure has been the addition of the wearing of gloves for all patients and not just the MRSA positive patients.

Data Collection and Analysis

Data collection and its interpretation will provide the needed information to support or reject the hypothesis of this research proposal. With this information the NICU will be able to determine if the appropriate policies and procedures are in place or if changes need to be made. The method for data collection on the compliance of hand washing and the wearing of gloves will be through observation. There would be someone designated to observe the staff and visitors to determine if there is compliance of the unit’s policy. They would be informed that they will be observed at times. There cannot be continuous monitoring but designated times throughout the day where observations will be recorded (Nieswiadomy, 2012). The observation criteria would be based on the NICU’s policy on hand hygiene.(University Health System [UHS], 2011) This policy is based on the guidelines set by the Centers for Disease Control and
Prevention (CDC, 2002). The observation period would be a designated time of six months where compliance or non-compliance will be documented.

The remaining factor in the research hypothesis that requires data collection is the incidence of MRSA. The unit will continue to do weekly MRSA surveillance. The research would monitor the occurrence of MRSA during the six month observation period as compared to the occurrence prior to the use of gloves.

**Interpretation of the Data**

Inferential statistics will be used in this research proposal to test the hypothesis. These statistics will be searching for a correlation between the two variables in the hypothesis (Nieswiadomy, 2012). They will help to determine if there is a correlation between compliant hand hygiene and the wearing of gloves with a decrease in the incidence of MRSA. The null hypothesis states that there is no correlation between them. The goal of this research proposal is to reject the null hypothesis. In rejecting this null hypothesis, the research will support the stated hypothesis that the wearing of gloves, along with compliant hand hygiene, will decrease the incidence of MRSA. The chi-square test will be appropriate to compare the data collected. The rate of MRSA occurrence will be monitored over the designated time and these rates will be compared to prior rates and this data will be correlated with the observation of hand hygiene compliance. This information can be presented by the use of bar graphs or scatter plots (Nieswiadomy, 2012) to show the correlation of the use of gloves and the incidence of MRSA. If a correlation is confirmed, then the practice of compliant hand hygiene and the wearing of gloves should be continued and mandated. If it is found that there is no decrease in the incidence of MRSA then policies and procedures need to change. Education needs to occur. Continued
observation on hand hygiene compliance is essential to ensure safe practice. MRSA surveillance should be continued and rate compared quarterly and reported to staff.

**Fair Treatment of Subjects**

There will be no procedures that will cause harm to the participants. The MRSA swab is uncomfortable for the infant but they are not harmed. The observation of hand hygiene and the wearing of gloves is also not a harmful procedure. The main harm that could occur is that the non-compliant hand hygiene causes a spread of MRSA in the unit and a formally healthy infant becomes infected.

**Conclusion**

The incidence of MRSA continues to be a problem in the hospital setting. The actions of health care workers can have a large impact on this incidence of infection in the Neonatal Intensive Care. An act as simple as hand washing and the wearing of gloves can make a difference in the health of these fragile infants. Infections prolong the infant’s hospitalization and it is costly to the patient and the facility. Nursing has had the reputation as a nurturing and caring profession. Nurses do not ever want to be responsible for harming a patient. But if nursing, or other medical staff, do not wash their hands or wear gloves appropriately infections can be spread and harm is done (Mortell, 2012). Insufficient infection control practices can always be improved on and the protection of our susceptible infants can be insured. This research proposal is intended to lead to improved practice and healthier babies. By adhering to strict infection control policies the incidence of MRSA can be prevented and controlled (Rahim & Barnett, 2009). The use of gloves is also an essential added safeguard. Education of staff and visitors is crucial. As with other research proposals, the need for further research is needed. It will be very beneficial to study how improved education could improve the hand hygiene
compliance. Further studies on the type of soaps or alcohol rubs being used and how they could be improved could help decrease the incidence of infection.
NURSING RESEARCH PROPOSAL: DECREASING MRSA BY

References


