STUDY OF THE COMPARATIVE EFFECTIVENESS OF FOUR PROCEDURES FOR MAINTAINING THE STERILITY OF USED INFUSION NEEDLES FOR VENOCLYSIS REINSERTION

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This experimental study was undertaken to determine (1) which of the four procedures was the most effective in maintaining the sterility of the infusion needle for venoclysis reinsertion, (2) whether there was any difference in the percentage of contamination, and (3) what types of microbial contaminants were present in the cases in which the different procedures were used.

The subjects were twenty-four pediatric patients, or six cases in each sequence of four from the pediatric ward of the Western Visayas Medical Center at Mandurriao, Iloilo City.

The post-test-only control group design was used. The four procedures utilized by the nurses involved (1) the use of Cidez™ disinfecting solution, (2) the use of capillary plastic tubing soaked in disinfecting solution overnight, (3) the use of sterile gauze, and (4) the use of disinfected intravenous medication port. Each specimen including those in the control group was obtained directly from each dislodged infusion needle by a medical technologist who took the specimen immediately to the clinical laboratory for incubation and culture testing. The results of the sterility and the culture testing were observed and recorded every 24, 48 and 168-hour interval. The results were verified by the Head Bacteriologist of WVMC.

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Findings. The results of the fluid thioglycolate (FT) testing and the McConkey agar culture plates showed that:

1. All the specimens taken from the infusion needles for all the four procedures used for maintaining sterility were found to be free of any disease-producing microbes within 48 hours from the time the infusion needles were pulled out of the patient's veins. No pathogens were found in the needles from the control group.

2. After 48 hours, two procedures — medication port and sterile gauze — were found to have one contamination each. The procedures using capillary tubes and soaking solution had two contaminations each. The control group was completely free of any pathogens.

3. All the specimens using the four procedures were free of monilia isolates until the 96th hour when the microbes were identified. Two instances of contamination out of six cases using Procedure capillary tubes and one case out of six using Procedure sterile gauze were found to have been contaminated by the same microbes by the 96th hour.

Staphylococcus aureus was isolated after 72 hours or three days in the specimens from Procedure Cidex™ soaking solution. In Procedure medication port, staphylococcus was isolated in 168 hours, or seven days.

Conclusions. From the results of the study, the following conclusions have been drawn:

1. All the four procedures were 100 percent effective in maintaining the sterility of used infusion needles within 48 hours as shown by the fact that all the specimens were clear of any microbial growth within this period.

2. After 48 hours, it is not safe to reinsert used infusion needles treated with any of the four procedures because disease-carrying microbes were isolated at various intervals after this time. Identified microbial contaminants include staphylococcus aureus and monilia organism.

3. The results of the control group indicated that aseptically pulled out dislodged needle is certainly sterile. Effort was made to reinsert the needle after it had been pulled out or dislodged, without subjecting the needle to any of the four aforementioned procedures.

Recommendations. Based on the results of the study and the conclusions arrived at, the following recommendations are advanced:

1. A dislodged infusion needle may be reinserted into the patient's vein within forty-eight hours after it has been aseptically pulled out.

2. All of the four procedures are effective within the 48-hour period, if there is a need for reinsertion. The administration must choose or prescribe whichever procedure is cost-effective or most economical. It might be remembered that:

   a. The use of the medication port will not cost anything since the in-use intravenous set is utilized. The needle should be carefully inserted through the softest part at the center of the medication port to protect the tip of the needle from being blunt and causing pain.

   b. Capillary tubes can be made from discarded intravenous tubing cut into the desired length and soaked in disinfectant solution of Cidex™ overnight. The needle protector that comes with every pack should be conserved, soaked in disinfectant solution, and held in place with surgical tape.

   c. A piece of 4 x 4 sterile, single ply gauze costs P4.50.

   d. Disinfectant soaking solution of Cidex™ of 120 centiliters costs P35.

3. Similar studies might be conducted on a larger scale considering other variables not covered by this study.

4. Hospital directors, ward administrators, chiefs of nursing services and physicians should work together to make lawmakers and the Philippine Nursing Board update nursing laws and policies to meet the needs of the patients in hospitals and to improve health care delivery system. One of the problems is the law which specifies that nurses may not insert IV's. A special group of persons other than doctors might be trained for the job of intravenous insertion and their services made available round the clock in hospitals to relieve the doctors of this job and to respond immediately to the patients' need.

5. Nurses should find the time to record when a needle has been dislodged from the patients' vein.

6. The results of this study should be disseminated and made a part of the guidelines for better patient care.