Assessing the Efficacy of Recommended Antiseptics for Killing Bacterial Growth in Neonatal Blue Bulb Syringes: Addressing a Clinical Issue

Linda A. Hanson, MBA, BSN Honors Student, College of Nursing, Pamela V. O’Neal, PhD, RN, College of Nursing, Ellise Adams, PhD, CNM, College of Nursing, Joseph G. Leahy, PhD, College of Science

Overview

Blue Bulb Syringes (BBSs)
• Used to remove oral and nasal secretions from newborns
• Provided to parents at hospital discharge
• Can be purchased by parents for home use during times of respiratory illness
• Multi-use device
• Current recommendation for cleaning: rinsing in warm, soapy water
• Previous research identified bacterial growth in a BBS
• No research studies have identified the efficacy of cleaning methods for killing bacteria growing in secretions inside the BBS
• Three inexpensive, widely-available antiseptics are effective in killing bacterial growth within a BBS

Methods

Why Escherichia coli?
• Most common bacteria (approximately 10%) found in BBS used in vaginal deliveries
• Leading cause of neonatal sepsis in newborns
• Leading cause of Early Onset Neonatal Bacterial Meningitis (EONBM)

Intervention

Application of a specific concentration of selected antiseptic

Null hypothesis

Intervention would have no impact on bacterial colony count

Criteria for selection of antiseptic included being inexpensive and widely available:

Triclosan: active ingredient in Equate® antibiotic dish detergent
Hydrogen Peroxide: Equate® hydrogen peroxide
Povidone-Iodine: active ingredient in Equate® antiseptic and Betadine
L-Lactic Acid: active ingredient in Palmolive® antibacterial dish detergent
Chlorhexidine Gluconate: active ingredient in Peridex® mouthwash

Results

• Negative control experiment showed that intervention is necessary to achieve a bactericidal state
• Triclosan is not an effective antiseptic—supports the recent FDA ban on Triclosan in household products
• Hydrogen Peroxide was bactericidal, but took approximately 4 minutes to achieve a 2-log kill
• Povidone-Iodine achieved a 2-log kill, killing 99% of existing bacteria in 27 seconds
• L-Lactic Acid achieved a 2-log kill, killing 99% of existing bacteria in 26 seconds
• Chlorhexidine Gluconate achieved a 2-log kill, killing 99% of existing bacteria in 25 seconds

Impact on Nursing

• Blue Bulb Syringes have the potential to cause disease in a newborn or young child if reused
• Three antiseptics identified which are more effective than the current recommendation at killing bacterial growth in a BBS
• Identified antiseptics are inexpensive and widely available
• Identified antiseptics can be used in underdeveloped areas of the world
• Effective killing of bacteria in a BBS has potential to break the chain of infection at the mode of transmission

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References