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Original Article

Breast milk reduced umbilical cord separation and bacterial colonization: Article Review.

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ABSTRACT

Owing to cultural traditions and variations in global health care practices, umbilical cord care practices vary across countries. The use of topical human breast milk has been proposed as an important cord care regimen, because antimicrobial and healing properties and anti-inflammatory effects have been seen in human breast milk. Human breast milk, including leukocytes, epithelial cells, and stem cells, serves an infant's dietary needs and is also considered a medicinal agent. Therefore, topical application of human breast milk, baby atopic eczema diaper dermatitis, was successful in treating tender nipples. A safe, simple, cheap, and non-invasive approach to care for the umbilical cord is the topical application of human breast milk to the umbilical cord. Human breast milk is also an easily usable and anti-infective agent that is widely available for use in developing and advanced countries.

Key words: human breast milk, cord care, bacterial colonization, cord separation time.

Introduction

Bacterial infections (sepsis, meningitis, and pneumonia) still cause over 700,000 newborn fatalities annually, or almost 25% of the three million neonatal deaths that occur globally, despite significant progress made internationally in recent decades. **(Lawn et al, 2014 & Liu et al, 2012)** In addition, the umbilical cord may serve as a common entrance site for invasive infectious agents, whether or not omphalitis symptoms are present, though the extent of its role in those deaths is still unknown.

One of the main public health prospects of the twenty-first century may be the newborn death rate associated with bacterial contamination of the stump point. (**Mullany et al, 2006**).

Neonatal omphalitis is frequently associated with low birth weight, protracted rupture of the membranes, point catheterization, chorioamnionitis, unexpected home birth or septic delivery, and other risk factors. **(Güvenç et al, 1997& Mason et al, 1989)** Furthermore, the risk of omphalitis may be six times higher in underdeveloped nations for home births than for hospital births. **(Sawardekar, 2004)** The umbilical cord's susceptibility to bacterial colonization has been demonstrated by numerous research. Time to cord separation and bacterial colonization are influenced by the method used to care for the umbilical cord after delivery. **(Verber ,1993; Ronchera-Oms et al, 1994; Novack AH et al, 19987& Arad at al,1981)**.

The cord that has lost vitality offers the ideal environment for the growth of bacteria. The mother's route and various native bacterial sources at the delivery site are sources of potentially infectious microorganisms that colonize the umbilical cord; most obviously, non-sterile hands of anybody assisting with the delivery are the main source. **(Mullany, 2007)**. As always, Staphylococcus aureus is the most frequently rumored bacterium. Other common infections include Gram-negative bacteria such as Escherichia coli, Klebsiella species, and Pseudomonas species, as well as group A and group B streptococci. Anaerobic and polymicrobial illnesses are uncommon. In addition to omphalitis, umbilical cord colonization can result in tetanus in newborns, especially in nations with limited resources. This infection arises from the application of unhealthy substances to the cord stump or from the Clostridium tetani infection at the umbilical separation site from a non-sterile equipment used to separate the umbilical cord throughout the peripartum period. **(Airede, 1992).** Because of the umbilical cord's direct access to the blood, bacterial colonization and infection will cause a number of issues. These consequences include the occurrence of intra-abdominal abscesses, peri-umbilical discharge), omphalitis with inflammation, phlebitis in the portal and/or umbilical veins, peritoneal inflammation, and intestinal ischemia. **(Forshall, 1957; Lally et al, 1984; Monu& Okolo, 1990& Samuel et al, 1994)**. Neonatal omphalitis can be classified into four severity levels: (1) Funisitis/umbilical discharge (a putrid, fusty discharge with an unhealthy-looking cord); (2) Cellulitis of the abdominal wall associated with omphalitis (periumbilical erythema and tenderness along with an unhealthy-looking cord with discharge); (3) Systemic signs of infection associated with omphalitis; and (4) Necrotizing fasciitis associated with omphalitis (umbilical necrosis with periumbilical ecchymosis, crepitus, bullae, and evidence of The prevalence of omphalitis in various populations varies substantially, based on antenatal and postnatal care practices, cultural variations in the treatment of the cord, and place of delivery (home versus hospital). There is a severe lack of trustworthy contemporary data regarding the rates of untreated neonates. **(Sawardekar, 2004)**.

Neonatal omphalitis is now uncommon in high-resource countries, with an estimated frequency of about one case per 1,000 children treated with dry cord care (three instances out of 3518 infants, for example, were reported in two papers from a North American country). **(Dore at al, 1998; Janssen et al, 2003)**. Up to 22% of babies delivered at home and up to 8% of babies born in hospitals in low-income neighborhoods have omphalitis, with 17% of those cases being moderate to severe and 2% being linked to infection. **(Mir at al, 2011)**. However, when placing a wager on omphalitis, case-fatality rates as high as 13% are anticipated. Necrotizing fasciitis is associated with a high case-mortality rate due to its predictable consequences from septic shock. The World Health Organization (WHO) has issued conflicting recommendations regarding cord care as a result of these inconsistent observations in various settings. The WHO recommends applying chlorhexidine gel or solution to newborns born at home or in environments with high neonatal mortality rates, and dry cord care for babies born in hospitals or other settings with low neonatal mortality rates. **(WHO, 2014)**.

EVIDENCE-BASED PRACTICE:

Even in high-resource nations where the birth environment is relatively sterile, best techniques for umbilical cord antisepsis are still debatable and inconsistent. Unhealthy substances are still applied to the omphalus in resource-constrained countries due to cultural customs, which creates a perfect setting for the development of neonatal omphalitis. Clean deliveries and healthy umbilical cord care are necessary to achieve the global aim of preventing omphalitis. Cutting the cord using a sterile blade or scissors is necessary to avoid microorganisms that could cause omphalitis or neonatal tetanus. It is best to do this while wearing sterile gloves. In high-resource countries and for in-hospital births elsewhere, as will be discussed later, dry cord care is preferred under most circumstances, but the application of topical substances is not advised; topical antiseptic is typically advised for infants born outside of hospital settings in communities with high neonatal mortality rates. **(WHO, 2014)**.

Let the cord heal naturally because new research shows that rubbing alcohol does not encourage drying, is less effective against bacteria than other antimicrobials, and lengthens the time it takes for the chord to separate. It is preferable to let the cord dry out and come off naturally, even if it may be tempting to "help" it fall off if it seems to be hanging on by a thread. Avoid taking up and yanking off the rope. Maintain the cleanliness of the space. Following each diaper change, some pediatricians advise wiping the cord's base with rubbing alcohol. Some pediatricians believe alcohol irritates the skin and can sometimes delay healing, therefore they would rather leave the stump alone. **(http://www.americanpregnancy.org/week/umbilical, 2010).**

Breast milk contains photolytic enzymes, alternative shows immunological chemicals, and polymorphonuclear leukocytes, which can speed up the challenging process of umbilical cord separation. According to earlier research, topical application of human milk and cord dry care groups resulted in a quicker cord separation time than topical application of povidone-iodine. **(Vural &Kiza, 2007)**.

In this study, which included 100 neonates at Minia University Hospital, human milk was compared to ethanol in a highly quasi-experimental design with 50 neonates in each group. The duration of cord detachment was noted. At birth, on day three, and when the cord was separated, microbiological testing, total viable bacterial count (TVC), and species identification of the relevant bacteria were carried out. Within the human milk and alcohol groups, the mean cord separation times were 4.3±1.4 (SD) and 8.2±2.2, respectively ($p<0.001$). In the TVC, there have been notable variations between the two groups ($p<0.001$). Staphylococci epidermidis, Staphylococcus aureus, Micrococci, Escherichia coli, and Enterobacterial species were among the isolated organisms; the alcohol group included higher concentrations of unhealthy species. **(Mahrous et al, 2012)**.

Umbilical cord care using human milk is supported by several studies including one study **Aghamohammadi et al (2012)** that reported that the Median time of cord separation in the human milk application group (151.0±28.7 hours) was significantly shorter than dry cord care group (180.9±37.4 hours; $P<0.001$). Another study with 105 babies in total was listed and randomly assigned to three groups, each with 35 participants: the dry cord care group (control group), the four-dimensional antiseptic group, and the human breast milk group.

At baseline, there was no statistically significant variation in the colonization of the cord ($P = 0.13$). Within the groups receiving breast milk, chlorhexidine, and dry cord care, at 72 ± 12 hours, there was colonization in 34.3%, 5.7%, and 51.4% of cases, respectively ($P < 0.001$). At 120 ± 12 hours, 22.9% of the breast milk group, 71.4% of the dry cord care group, and only 2.9% of the chlorhexidine group had bacterial colonization ($P < 0.001$).

In the groups receiving dry cord care, chlorhexidine, and breast milk, the temporal order of cord separation was 10.54 ± 3.1 days, 12.65 ± 2.9 days, and 9.09 ± 2.4 days, respectively. The breast milk group required the least amount of time for separation, whereas the chlorhexidine treatment required the longest ($P < 0.001$). **(Abbaszadeh, Hajizadeh&Jahangiri,2016)**. Enterobacteria pneumoniae, Escherichia coli, Enterococcus faecalis, Acinetobacter baumannii, Enterococcus faecium, Coccus hemolyticus, and streptococci were the most common microbes found. **(Lyngdoh et al, 2018)**.

The previous studies are congruent with another report **Allam et al (2015)** It demonstrated how applying a mother's breast milk topical to the remaining portion of the cord shortens the time it takes for cord separation and is a simple, affordable, and noninvasive method of cord care.

Summary and Conclusions:

The conclusion is that human breast milk is a superior substitute for conventional cord care materials and can, to some extent, lessen bacterial colonization in low-resource environments.

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