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EARLY INITIATION OF BREASTFEEDING AS A PROTECTIVE STRATEGY AGAINST NEONATAL SEPSIS : A REVIEW OF CURRENT EVIDANCE

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Abstract

Background:*Neonatal sepsis remains one of the leading causes of neonatal morbidity and mortality worldwide. Early Initiation of Breastfeeding (EIBF), defined as breastfeeding within the first hour after birth, has been recognized as a simple, effective, and cost-efficient intervention that may reduce the risk of neonatal infections. Through the provision of colostrum and the enhancement of neonatal immune function, EIBF plays a crucial role in improving neonatal health outcomes and survival.****Objective:*** *To review current evidence regarding the role of Early Initiation of Breastfeeding (EIBF) as a protective strategy against neonatal sepsis.****Methods:****A literature review was conducted using articles retrieved from PubMed, Scopus, ScienceDirect, Google Scholar, and SpringerLink. The search included studies published between 2021 and 2025 using keywords related to early initiation of breastfeeding, colostrum, neonatal sepsis, and neonatal health outcomes. Eligible articles were selected based on their relevance and analyzed using a thematic approach to identify key findings regarding the relationship between EIBF and neonatal sepsis prevention.****Results:****The reviewed literature demonstrated that EIBF contributes significantly to reducing the risk of neonatal infections, including neonatal sepsis. This protective effect is primarily attributed to the immunological benefits of colostrum, which contains antibodies, immune cells, and bioactive components that enhance neonatal immunity. EIBF also supports the establishment of healthy intestinal microbiota and improves overall neonatal adaptation after birth. Furthermore, studies reported that EIBF is associated with lower rates of neonatal morbidity and mortality. However, several barriers to EIBF implementation were identified, including cesarean delivery, inadequate breastfeeding support from healthcare providers, and limited maternal knowledge regarding the benefits of early breastfeeding initiation.****Conclusion:****Early Initiation of Breastfeeding is an effective strategy for preventing neonatal sepsis and improving neonatal health outcomes. Strengthening EIBF practices through health education, supportive healthcare policies, and enhanced breastfeeding support should be prioritized as part of comprehensive neonatal healthcare programs to reduce neonatal morbidity and mortality.*

Keywords: *early initiation of breastfeeding, colostrum, neonatal sepsis, neonatal health, newborn infection*

INTRODUCTION

Neonatal sepsis remains one of the leading causes of neonatal morbidity and mortality worldwide, particularly in low- and middle-income countries. The condition is characterized by a systemic infection occurring within the first 28 days of life and may result in severe complications such as respiratory failure, neurological impairment, multiple organ dysfunction, and death if not treated promptly. Despite significant advances in neonatal healthcare, neonatal sepsis continues to pose a major public health challenge and contributes substantially to preventable newborn deaths (Kariniotaki et al., 2025).

The neonatal period represents a critical stage of life during which the immune system is still immature and highly vulnerable to infectious diseases. Consequently, preventive interventions that strengthen neonatal immunity are essential to reducing the burden of neonatal infections. One of the most effective and low-cost interventions recommended by the World Health Organization (WHO) is Early Initiation of Breastfeeding (EIBF), defined as placing the newborn to the breast within the first hour after birth (Osman et al., 2024).

Early initiation of breastfeeding enables newborns to receive colostrum immediately after birth. Colostrum contains high concentrations of immunoglobulin A (IgA), leukocytes, lactoferrin, oligosaccharides, growth factors, and antimicrobial substances that provide passive immunity and protect infants against bacterial and viral infections. Because of its immunological properties, colostrum is frequently referred to as the newborn's first vaccine and plays a crucial role in enhancing neonatal immune defense during the early days of life (Rifat et al., 2025).

Recent evidence suggests that timely breastfeeding initiation is strongly associated with improved neonatal survival. A study by (Hammad et al., 2025) reported that infants who initiated breastfeeding later than one hour after birth had a 30% higher risk of infant mortality compared with those who were breastfed within the first hour of life. Similarly, (Ayalew et al., 2024) found that delayed breastfeeding initiation increased the risk of neonatal mortality by approximately 33%, and delays exceeding 24 hours could double the risk of neonatal death. In addition to reducing mortality, early breastfeeding initiation may decrease the occurrence of severe neonatal illnesses that frequently precede neonatal sepsis. Breast milk provides both nutritional and immunological protection, reducing exposure to pathogenic microorganisms and supporting the development of a healthy intestinal microbiome. Several studies have demonstrated that breastfed infants experience lower rates of infection-related illnesses, including neonatal sepsis, pneumonia, meningitis, and gastrointestinal infections compared with non-breastfed infants (Strunk et al., 2024)

Furthermore, evidence indicates that delayed initiation of breastfeeding is associated with an increased risk of neonatal sepsis. Early breastfeeding initiation has been shown to reduce severe neonatal illness and danger signs that often lead to suspected sepsis during the first week of life. This protective effect is thought to occur through enhancement of neonatal immunity and prevention of bacterial colonization by pathogenic microorganisms (Ayalew et al., 2024).

Although the benefits of EIBF are well documented, its implementation remains suboptimal in many developing countries. Factors such as cesarean delivery, inadequate breastfeeding counseling, limited maternal knowledge, lack of skin-to-skin contact, and insufficient healthcare support continue to hinder breastfeeding initiation within the first hour after birth. Given the persistent burden of neonatal sepsis and the growing evidence supporting the protective role of breastfeeding, a comprehensive review of current literature is needed to synthesize recent findings regarding the relationship between Early Initiation of Breastfeeding and neonatal sepsis. Therefore, this review aims to examine the current evidence on how EIBF

contributes to the prevention of neonatal sepsis and improves neonatal health outcomes, thereby providing valuable insights for healthcare professionals, policymakers, and researchers involved in neonatal care (Kariniotaki et al., 2025).

METHODS

This study employed a literature review design to examine current evidence regarding the role of Early Initiation of Breastfeeding (EIBF) as a protective strategy against neonatal sepsis. Relevant literature was identified through electronic database searches, including PubMed, Scopus, ScienceDirect, Google Scholar, and SpringerLink. The search strategy followed a structured approach to identify, screen, and select relevant studies based on predefined inclusion and exclusion criteria. Literature published between 2021 and 2025 was included to ensure the use of current evidence. Keywords used in the search process included *"early initiation of breastfeeding," "breastfeeding initiation," "colostrum," "neonatal sepsis," "newborn infection," "neonatal mortality,"* and *"neonatal health outcomes."*

The inclusion criteria consisted of peer-reviewed original research articles, systematic reviews, and meta-analyses published in English that discussed the association between EIBF and neonatal health outcomes, particularly neonatal infections and sepsis. Articles published before 2021, conference abstracts, meditorials, letters, and duplicate studies were excluded. The study selection process involved screening titles, abstracts, and full-text articles. Data from eligible studies were then synthesized using thematic analysis to identify key findings related to the immunological benefits of breastfeeding, prevention of neonatal infections, barriers to EIBF implementation, and implications for neonatal health. This review was conducted following the principles of systematic evidence synthesis to ensure transparency and methodological rigor.(Huberman & Miles, 2018)

RESULTS

The literature review identified several studies published between 2021 and 2025 that examined the relationship between Early Initiation of Breastfeeding (EIBF) and neonatal health outcomes. The findings consistently demonstrated that EIBF provides significant protective effects against neonatal infections, including neonatal sepsis. Studies reported that breastfeeding initiated within the first hour after birth enables newborns to receive colostrum, which contains immunoglobulin A (IgA), lactoferrin, leukocytes, and other bioactive compounds that strengthen the neonatal immune system and reduce susceptibility to bacterial infections (Kariniotaki et al., 2025).

Several studies also found that delayed breastfeeding initiation was associated with increased neonatal morbidity and mortality. Infants who did not receive breast milk within the first hour of life were more likely to experience infectious diseases and severe neonatal complications compared with those who received timely breastfeeding initiation (Hammad et al., 2025). Furthermore, evidence indicated that EIBF contributes to the establishment of a healthy intestinal microbiota, which plays an important role in protecting newborns from pathogenic bacterial colonization and subsequent infections (Strunk et al., 2024).

The reviewed literature further identified several barriers to EIBF implementation, including cesarean delivery, inadequate breastfeeding support, lack of maternal knowledge, delayed skin-to-skin contact, and insufficient healthcare provider training. These barriers contribute to the suboptimal implementation of EIBF, particularly in developing countries where neonatal mortality rates remain relatively high (World Health Organization, 2024).

Overall, the reviewed studies suggest that EIBF serves as an effective and low-cost intervention that can reduce the risk of neonatal infections, improve neonatal survival, and support optimal neonatal health outcomes.

DISCUSSION

The findings of this review highlight the important role of Early Initiation of Breastfeeding as a preventive strategy against neonatal sepsis. The protective effect of EIBF is primarily attributed to the immunological properties of colostrum, which is rich in antibodies, antimicrobial proteins, and immune cells. These bioactive components provide passive immunity during the neonatal period, a stage when the infant's immune system is still immature and highly vulnerable to infection (Kariniotaki et al., 2025).

Breast milk has been shown to contain secretory immunoglobulin A (sIgA), lactoferrin, lysozyme, cytokines, and human milk oligosaccharides that contribute to the inhibition of pathogenic microorganisms. Through these mechanisms, EIBF reduces the likelihood of bacterial invasion and systemic infections that may progress to neonatal sepsis. This finding is consistent with the neonatal sepsis model proposed by (Strunk et al., 2024), which emphasizes the importance of strengthening neonatal immunity to prevent severe bacterial infections. In addition to its immunological benefits, EIBF facilitates early skin-to-skin contact between mother and infant. Skin-to-skin contact promotes thermal regulation, stabilizes cardiorespiratory function, reduces stress responses, and supports the early establishment of breastfeeding. These physiological benefits indirectly contribute to reducing neonatal morbidity and mortality, including conditions associated with neonatal sepsis (World Health Organization, 2024).The findings also reveal that delayed initiation of breastfeeding remains a significant challenge in many healthcare settings. Cesarean section delivery, inadequate breastfeeding counseling, and limited healthcare support frequently hinder the successful implementation of EIBF. These findings suggest that healthcare providers should strengthen breastfeeding promotion programs and ensure that mothers receive adequate support immediately after childbirth.

From a public health perspective, EIBF represents a simple, cost-effective, and evidence-based intervention that can substantially improve neonatal outcomes. Integrating breastfeeding promotion into maternal and neonatal healthcare services may contribute to reducing neonatal sepsis incidence and achieving global targets for neonatal mortality reduction. Therefore, healthcare institutions and policymakers should prioritize interventions that facilitate breastfeeding initiation within the first hour of life.

The findings of this review indicate that Early Initiation of Breastfeeding has significant potential to reduce the risk of neonatal sepsis through immunological protection, promotion of healthy microbiota development, and enhancement of neonatal physiological stability. Consequently, EIBF should be considered an essential component of neonatal infection prevention strategies and newborn healthcare programs worldwide.(Fernando et al., 2023)

The findings of this review are also supported by several studies conducted in Indonesia. Research by (Fernando et al., 2023) demonstrated that Early Initiation of Breastfeeding (EIBF) is effective in maintaining neonatal body temperature and preventing hypothermia among newborns. Hypothermia is recognized as one of the factors that may increase neonatal vulnerability to infection and other complications during the early neonatal period.

Similarly, (Ahmad, 2020) reported that the implementation of EIBF contributes to reducing neonatal morbidity and mortality through early provision of colostrum and improved physiological adaptation after birth. Colostrum contains essential immunological components that help strengthen neonatal immunity during the first days of life. Furthermore, (Yuliastuti, 2024) explained that colostrum obtained through EIBF provides protection against neonatal infections because it is rich in antibodies and bioactive substances. The study also highlighted that skin-to-skin contact during EIBF helps maintain thermal stability and supports neonatal adaptation immediately after birth.

Evidence from Indonesia also indicates that EIBF contributes to reducing neonatal mortality. Rezky et al. found that newborns who received breastfeeding initiation shortly after birth had a lower risk of neonatal death compared with those experiencing delayed breastfeeding initiation. These findings support global evidence emphasizing the importance of breastfeeding within the first hour of life as a simple and cost-effective intervention to improve neonatal survival (Rezky, 2021).

CONCLUSION

Early Initiation of Breastfeeding (EIBF) is an effective and evidence-based strategy for reducing the risk of neonatal sepsis and improving neonatal health outcomes. The findings of this literature review indicate that breastfeeding within the first hour after birth provides newborns with colostrum, which contains essential immunological components such as immunoglobulins, lactoferrin, leukocytes, and other bioactive substances that strengthen the neonatal immune system and protect against infectious diseases. In addition, EIBF supports the establishment of healthy intestinal microbiota, promotes thermal regulation, enhances physiological adaptation, and contributes to reducing neonatal morbidity and mortality.

The reviewed literature consistently demonstrates that delayed breastfeeding initiation is associated with a higher risk of neonatal complications, including infections that may progress to neonatal sepsis. Despite the well-documented benefits of EIBF, its implementation remains suboptimal in many settings due to factors such as cesarean delivery, inadequate breastfeeding support, limited maternal knowledge, and insufficient healthcare interventions. Therefore, strengthening EIBF practices should be considered an important component of neonatal infection prevention and newborn care programs. Overall, current evidence supports the role of Early Initiation of Breastfeeding as a simple, low-cost, and highly effective intervention for improving neonatal survival and reducing the burden of neonatal sepsis.

SUGGESTIONS

Based on the findings of this review, healthcare professionals should actively promote and facilitate Early Initiation of Breastfeeding immediately after birth by providing adequate breastfeeding counseling and support to mothers during the antenatal, intrapartum, and postpartum periods. Healthcare facilities are encouraged to implement evidence-based breastfeeding policies, including skin-to-skin contact and Baby-Friendly Hospital Initiative (BFHI) practices, to increase the success of EIBF implementation.

For policymakers, greater attention should be given to developing programs and policies that support breastfeeding promotion as part of neonatal health strategies. Educational campaigns aimed at increasing maternal and family awareness regarding the benefits of EIBF should also be strengthened. For future researchers, further studies using prospective cohort designs, randomized controlled trials, or systematic reviews with meta-analysis are recommended to

provide stronger evidence regarding the direct relationship between Early Initiation of Breastfeeding and the prevention of neonatal sepsis. Additionally, research exploring barriers and facilitators of EIBF implementation in different healthcare settings would contribute to improving breastfeeding practices and neonatal health outcomes.

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