



## Breast Milk Jaundice in Neonates: Nursing Roles in Early Detection and Parental Support: An Updated Review

<sup>1</sup>-Ali Humood Salah Alharbi,<sup>2</sup>-Ehsan Mohammed Mansoor Junaid,<sup>3</sup>-Khadijah Mohammad Abdo Masrhi,<sup>4</sup>-Rabab Jida Gabsh Albdrani,<sup>5</sup>-Fatmah Falah Alrouili,<sup>6</sup>- Abdullah Ali Suhaib Al-Qahtani,<sup>7</sup>-Razan Mohammed Almutairi,<sup>8</sup>-Sami Faisal Alotibi,<sup>9</sup>-Maryam Mohd Ahmed Kinani,<sup>10</sup>-Samira Dhaifalla Ali,<sup>11</sup>-Alanoud Marzoog Almutairi,<sup>12</sup>-Jaber Nashmi Aldhafeeri,<sup>13</sup>- Badr Nuran Alrashedi,<sup>14</sup>-Camellia Hassan Aljorfi,<sup>15</sup>-Abeer Ali Almatrafi,<sup>16</sup>-Adil Ali Ali Imdawiah

1. Ksa, Ministry Of Health, Eradah Complex And Mental Health - Jeddah
2. Ksa, Ministry Of Health, Prince Mohammed Bin Nasser Hospital
3. Ksa, Ministry Of Health, Sabya Genral Hospital
4. Ksa, Ministry Of Health, Alsalam Endowment Hospital Almedina Almnorah
5. Ksa, Ministry Of Health, King Salman Hospital In Riyadh
6. Ksa, Ministry Of Health, Rawida General Hospital
7. Ksa, Ministry Of Health, Riyadh Health Cluster 3 - Executive Administration For Primary Healthcare Services In Riyadh
8. Ksa, Ministry Of Health
9. Ksa, Ministry Of Health, King Fahd Central Hospital Jazan
10. Ksa, Ministry Of Health, King Fahd Central Hospital In Jazan
11. Ksa, Ministry Of Health, Durma Center
12. Ksa, Ministry Of Health, Al-Mohammadiyah Health Center
13. Ksa, Ministry Of Health, Mch In Tabuk
14. Ksa, Ministry Of Health, King Salman Bin Abdulaziz Medical City
15. Ksa, Ministry Of Health, King Salman Bin Abdulaziz Medical City
16. Ksa, Ministry Of Health, Altuwal General Hospital

### Abstract:

**Background:** Breast milk jaundice is a common cause of prolonged neonatal hyperbilirubinemia in breastfed infants, with an onset typically after the third day of life. It requires careful differentiation from other pathological causes and robust nursing intervention to ensure early detection and effective parental support.

**Aim:** This review explores the etiology, clinical presentation, and management of breast milk jaundice, emphasizing the critical roles of nursing in early detection, parental education, and support.

**Methods:** A comprehensive literature review of current studies and clinical guidelines was conducted to synthesize knowledge on the causes, risk factors, and management strategies of breast milk jaundice.

**Results:** Breast milk jaundice is associated with specific components of human breast milk, such as  $\beta$ -glucuronidase and epidermal growth factor, which interfere with bilirubin conjugation and excretion. Genetic predispositions, such as UGT1A1 gene mutations, further increase susceptibility. While the condition is typically benign and self-resolving, severe cases may require interventions like phototherapy or temporary cessation of breastfeeding. Nurses play a pivotal role in assessing jaundice severity, monitoring bilirubin levels, educating parents on breastfeeding techniques, and coordinating care to prevent complications like kernicterus.

**Conclusion:** Effective management of breast milk jaundice relies on interdisciplinary collaboration and proactive nursing care. By educating and supporting parents, nurses can help ensure continued breastfeeding while minimizing the risks associated with hyperbilirubinemia.

**Keywords:** Breast milk jaundice, neonatal hyperbilirubinemia, nursing roles, parental support, breastfeeding management

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## **Introduction:**

Infant jaundice, clinically referred to as hyperbilirubinemia, represents a prevalent challenge in neonatal care. It is estimated that between 60% to 80% of term or late-term healthy neonates experience physiological jaundice, which is idiopathic in nature, showing no identifiable cause [1]. Neonatal hyperbilirubinemia is typically defined by total serum bilirubin (TSB) levels that fall within the high-risk zone or exceed the 95th percentile for the infant's age within the initial six days of life [1]. Jaundice appearing within the first 24 hours is indicative of a pathological origin and requires prompt medical attention. When TSB levels rise, infants exhibit a yellowish discoloration of the skin and sclera, commonly referred to as jaundice. Notably, breastfed infants have a higher incidence of neonatal hyperbilirubinemia compared to those fed formula [2]. This is primarily attributed to two mechanisms: "breastfeeding jaundice" and "breast milk jaundice." Breast milk jaundice was first documented in 1963, describing a condition in which certain breastfed infants experienced prolonged, unconjugated hyperbilirubinemia that persisted beyond the third week of life. This condition typically manifests after the third or fourth day, continuing through the first or second week of life. Although breast milk jaundice typically resolves spontaneously without the need to discontinue breastfeeding, it can persist for up to 8 to 12 weeks before the bilirubin levels return to normal [2]. Infants affected by breast milk jaundice generally exhibit higher peak serum bilirubin levels and a slower decline, necessitating a longer period for resolution compared to infants unaffected by this condition [3]. Before diagnosing breast milk jaundice, other pathological causes of persistent, unconjugated hyperbilirubinemia must be ruled out.

## **Nursing Diagnosis:**

Nursing diagnoses related to neonatal jaundice may include risk for injury due to treatment, risk for skin breakdown, and risk for impaired parent-infant bonding due to potential separation during treatment.

## **Causes:**

The precise etiology of breast milk jaundice remains undetermined, with many cases being classified as idiopathic. In early-onset cases, where jaundice becomes apparent within the first 2 to 3 days, the causes often overlap with those of physiological jaundice, including dehydration or delayed stooling, making differentiation difficult. For late-onset breast milk jaundice, which typically appears after 4 to 5 days, factors inherent to human breast milk are thought to play a significant role. One area of ongoing research focuses on the potential genetic mutations present in affected neonates. Certain components of human breast milk have been implicated in the development of breast milk jaundice, particularly proteins and enzymes that may inhibit bilirubin conjugation and thus hinder its excretion.  $\beta$ -glucuronidase, an enzyme naturally present in the body, deconjugates bilirubin in the intestinal brush border, leading to an elevation in unconjugated bilirubin levels [2]. Research has shown that this enzyme's activity is minimal in formula milk but considerable in human breast milk [4]. Additionally, interleukins IL1 $\beta$  and IL6 have been suggested to exert a cholestatic effect, contributing to hyperbilirubinemia [5]. Epidermal growth factor, present in higher concentrations in human breast milk and in the serum of exclusively breastfed infants, enhances the intestinal resorption of bilirubin and reduces neonatal intestinal motility, leading to elevated unconjugated bilirubin levels [2]. Furthermore, infants with breast milk jaundice often present with elevated levels of alpha-fetoprotein, although the underlying mechanism remains unclear. Several studies have also highlighted genetic mutations in the UGT1A1 gene, particularly in its coding region, as potential contributors to the increased risk of developing breast milk jaundice. Mutations in the regulatory region of

this gene are associated with conditions such as Crigler-Najjar and Gilbert syndrome, both of which are known to cause persistent hyperbilirubinemia [6].

### **Risk Factors:**

In the United States, the prevalence of breast milk jaundice is estimated to affect 20% to 30% of neonates between 3 to 4 weeks of age who are predominantly breastfed. Around 30% to 40% of breastfed infants are expected to have bilirubin levels greater than or equal to 5 mg/dL, with approximately 2% to 4% of exclusively breastfed infants having levels above 10 mg/dL by the third week of life [1]. International studies conducted in countries such as Turkey and Taiwan report a prevalence range of 20% to 28% in neonates with breast milk jaundice at four weeks of age, with corresponding serum bilirubin levels exceeding 5 mg/dL [6]. Although the international frequency of breast milk jaundice is not extensively documented, it is generally believed to mirror the prevalence observed in the United States. No studies have yet demonstrated a gender preference in the occurrence of breast milk jaundice.

### **Assessment:**

Breast milk jaundice typically presents during the latter half of the first week or the second week of life in otherwise healthy infants who are predominantly breastfed. These infants exhibit normal weight gain, along with the typical production of urine and stools [2]. A total serum bilirubin level exceeding 1.5 mg/dL is considered elevated at this stage, though jaundice may not become visibly apparent until the serum bilirubin level surpasses 5 mg/dL. When jaundice is present, the yellow discoloration of the skin and/or sclera is usually first observed on the face, progressing to the trunk and extremities in a cephalocaudal manner. The identification of jaundice in an infant younger than 24 hours requires immediate attention as it may suggest pathological jaundice. To detect jaundice in a neonate, a skin assessment should be conducted in a well-lit room. Mild pressure may be applied to the skin to blanch its normal ruddy hue, making the yellow discoloration more evident. The level of jaundice should be assessed daily, and alongside this, the nurse should monitor serum bilirubin levels and observe the infant's behavior, output, and feeding patterns to rule out other potential causes of jaundice.

### **Evaluation**

All newborns should undergo thorough assessment for jaundice, with particular attention to the potential presence of hyperbilirubinemia. The evaluation of an infant presenting with hyperbilirubinemia suspected to be due to breast milk jaundice should focus on excluding other potential pathological causes. Initially, both unconjugated and conjugated bilirubin levels should be measured. A conjugated bilirubin level below 1 mg/dL, or less than 20% of the total bilirubin level, is considered normal. Levels exceeding these thresholds may indicate underlying conditions such as biliary atresia, neonatal hepatitis, or disorders affecting bilirubin excretion. Both breast milk jaundice and hemolytic anemias lead to elevated unconjugated bilirubin levels. The differential diagnosis should rule out hemolytic causes of hyperbilirubinemia, including ABO incompatibility, G6PD deficiency, and hereditary spherocytosis, through tests such as direct Coombs' testing, measurement of hemoglobin, hematocrit, reticulocyte count, peripheral blood smear, and genetic screening. Additionally, if jaundice persists beyond 12 weeks of age, further investigation should be undertaken to exclude conditions like galactosemia and hypothyroidism, which have been identified as causes of unconjugated hyperbilirubinemia, typically detected in standard newborn screening tests [2][7][2].

### **Medical Management**

In cases of breast milk jaundice, treatment is generally not required unless the infant's total serum bilirubin exceeds 20 mg/dL, at which point phototherapy is recommended. Phototherapy utilizes light to convert bilirubin molecules into water-soluble isomers that can be more easily excreted by the body. When bilirubin levels remain below 12 mg/dL, continued breastfeeding is encouraged, with the expectation that jaundice will resolve by 12 weeks of age. For bilirubin levels between 12 and 20 mg/dL, if no hemolysis is observed, management remains the same. In instances where bilirubin exceeds 20 mg/dL, a brief 24-hour cessation of breastfeeding is typically recommended, which often results in a significant reduction of

bilirubin levels. This approach aims to facilitate the rapid clearance of bilirubin and promote the infant's overall health [2].

### **Nursing Management**

Alongside routine medical management, which typically involves monitoring the infant without altering breastfeeding practices, nursing management plays a vital role in educating and supporting parents of jaundiced infants. New parents may experience stress when faced with any abnormal condition in their newborn. In rare instances when an infant needs to pause breastfeeding for 24 hours, nurses should provide education on proper breast milk pumping techniques and safe storage practices. For infants continuing breastfeeding, the mother should be encouraged to feed the baby every 2 to 3 hours until the infant is able to self-regulate feeding. Sleepy, jaundiced infants may have difficulty staying awake long enough for adequate feeding, which can exacerbate hyperbilirubinemia. In such cases, the mother may benefit from breastfeeding support, and referral to a lactation consultant is advisable, especially where such services are available. Furthermore, as bilirubin is excreted, infants may experience more frequent, sometimes explosive stools. It is important to reassure parents that this is a normal part of the process, and emphasize that the green color in the stools correlates with a reduction in jaundice. Additionally, educating parents on proper infant bathing, diapering, and skincare techniques is crucial in preventing skin breakdown due to the increased frequency of stools and the potential for irritation from prolonged exposure to moisture.

### **When to Seek Help**

It is essential to notify the healthcare provider if jaundice is apparent in an infant under 24 hours of age. During the monitoring of serum bilirubin levels, the provider should be alerted if the bilirubin level exceeds 15 mg/dL. Additionally, if the infant exhibits signs of behavioral changes such as lethargy or irritability, decreased urine output, reduced stool frequency, or other indications of potential dehydration, parents should be encouraged to increase the frequency of feedings. Should the infant, particularly one older than 3 days, have fewer than six wet diapers in 24 hours or experience weight loss, it is crucial to notify the provider for further evaluation [10].

### **Coordination of Care**

While jaundice in breastfed infants is a frequent and typically benign condition, it requires careful management. Effective coordination among healthcare providers and open communication with parents are essential to exclude other potential causes of neonatal hyperbilirubinemia. By conducting routine newborn assessments and appropriate laboratory testing, the risk of kernicterus—the most severe complication of neonatal hyperbilirubinemia—can be mitigated. Moreover, with proper management, successful continuation of breastfeeding remains achievable.

### **Health Teaching and Health Promotion**

Parents of infants affected by jaundice should receive comprehensive education about the condition's nature. It is important to emphasize that breastfeeding should continue unless there are medical contraindications [8][9]. Continued breastfeeding is crucial for both the management of jaundice and the infant's overall well-being [10].

### **Discharge Planning**

Breastmilk jaundice is rarely diagnosed prior to the routine discharge of mother and baby. If an infant remains hospitalized for other treatments, early signs of breastmilk jaundice may become evident on the fourth or fifth day of life. In such cases, nursing staff should continue to provide education on routine infant care and support breastfeeding efforts. It is possible for an infant to experience physiological hyperbilirubinemia within the first 2–3 days of life, followed by a recurrence of jaundice due to breastmilk jaundice. Parents should be reassured, and they should be encouraged to spend as much time with the infant as possible. Additionally, parents should be taught to recognize expected output patterns and encouraged to engage in frequent breastfeeding sessions. If a lactation consultant is available for a home visit, this service should be recommended to further support the mother's breastfeeding journey. It is

important to reassure parents that while breastfeeding is a natural process, it can be challenging, especially during the early stages. Nursing support should focus on assisting both parents and infant in this process. If the healthcare provider recommends caloric supplementation, parents should be educated on the option of using a supplemental nursing system rather than resorting to artificial nipples [10].

### **Other Issues**

While breastfeeding is a natural process, it may not always come easily. It is a learned skill that requires both patience and practice, and for many women, the early stages of learning to breastfeed can be frustrating and physically uncomfortable. However, like any skill, breastfeeding becomes more manageable with continued practice. To help an infant who falls asleep at the breast within a few minutes, parents should be encouraged to wake the infant by gently unwrapping or undressing the baby down to a diaper. Frequent breastfeeding is essential for the elimination of bilirubin from the infant's system, and it also aids in establishing the mother's milk supply. If the infant sleeps for more than three hours during the day, parents should gently wake the baby by undressing and changing the diaper, followed by encouragement to breastfeed. If the mother experiences sore nipples from frequent breastfeeding, she should be advised to expose her nipples to air to prevent skin breakdown and further irritation. Additionally, the mother should be encouraged to vary the infant's position during each feeding to avoid repeated pressure on the same area of the breast. It is also important to ensure that the infant's mouth is wide open, with the lips curved around the breast tissue, not just the nipple. Observing the infant's latch during breastfeeding is crucial to ensure proper technique. For additional support, a lactation consultant can assist the mother with effective breastfeeding techniques, and these services are often covered by many insurance plans [10].

### **General Nursing Practices for Effective Breastfeeding:**

Nursing practices play a vital role in promoting successful breastfeeding and supporting mothers during this critical stage. Effective nursing care ensures proper education, skill-building, and emotional support, enabling mothers to establish and maintain breastfeeding. Below are key practices that enhance the breastfeeding experience:

1. **Education and Counseling:** Nurses should provide comprehensive education to mothers about the benefits of breastfeeding, emphasizing its role in infant nutrition, immunity, and bonding. Practical guidance on proper latching techniques, feeding positions, and recognizing hunger cues is essential. Mothers should be reassured that while breastfeeding is natural, it is also a learned skill requiring patience and practice.
2. **Assistance with Initial Breastfeeding:** During the early postpartum period, nurses should assist mothers in initiating breastfeeding within the first hour after birth. This "golden hour" helps stimulate milk production and fosters the infant's natural feeding instincts. Nurses should observe and guide mothers to achieve a proper latch, ensuring that the baby takes in the areola and not just the nipple.
3. **Addressing Common Challenges:** Nurses must be equipped to help mothers overcome common breastfeeding challenges, such as sore nipples, engorgement, and difficulty in maintaining the infant's interest during feeding. For instance, advising mothers to expose nipples to air, use varied feeding positions, or wake sleepy babies by undressing them gently can address many issues effectively. Referral to a lactation consultant may also be necessary for persistent challenges.
4. **Promoting Frequent Feedings:** Encouraging frequent breastfeeding, especially in the early days, is crucial for establishing a robust milk supply and preventing complications such as engorgement or jaundice in the infant. Nurses should advise mothers to feed every 2–3 hours or more frequently if the baby shows hunger cues. In cases where the infant is lethargic or jaundiced, nurses should assist in gently waking the baby for feedings.
5. **Emotional and Psychological Support:** Breastfeeding can be emotionally and physically demanding for mothers, particularly for first-time parents. Nurses should provide empathetic support, normalize the

learning curve associated with breastfeeding, and reassure mothers of their ability to succeed. Open communication and encouragement help reduce maternal anxiety and build confidence.

6. **Monitoring and Problem Identification:** Nurses should monitor both mother and baby for signs of effective breastfeeding, such as adequate milk transfer, weight gain, and sufficient wet and soiled diapers. If issues such as poor latch, insufficient milk supply, or infant dehydration are detected, prompt intervention and collaboration with healthcare providers are necessary.
7. **Encouraging Skin-to-Skin Contact:** Skin-to-skin contact between the mother and infant should be encouraged as it promotes bonding, stabilizes the baby's body temperature, and supports breastfeeding success. Nurses should educate mothers about the benefits of skin-to-skin interaction, particularly in the immediate postpartum period.
8. **Education on Pumping and Milk Storage:** For mothers needing to pump breastmilk, nurses should teach proper pumping techniques, including optimal frequency and duration. Clear instructions on safe milk storage and handling are also critical to ensure the health and safety of the infant.

### **Conclusion:**

Breast milk jaundice is a frequent yet largely benign condition that presents challenges for neonatal care and parental confidence. Its onset, typically during the first or second week of life, necessitates vigilant nursing assessment and timely differentiation from pathological causes of hyperbilirubinemia. The central role of nursing in managing breast milk jaundice encompasses monitoring the severity of jaundice, educating parents on breastfeeding practices, and coordinating care to prevent complications. Through routine skin and serum bilirubin assessments, nurses can identify cases requiring intervention, such as phototherapy, while ensuring that breastfeeding is supported and sustained whenever possible. Parental education is equally critical, as stress and confusion often accompany a diagnosis of jaundice. Nurses must provide clear guidance on feeding frequency, the importance of continued breastfeeding, and signs that warrant medical attention, such as behavioral changes or inadequate hydration. Additionally, referrals to lactation consultants can be instrumental in addressing breastfeeding challenges, particularly for mothers of sleepy or undernourished infants. The potential long-term consequences of untreated hyperbilirubinemia, including kernicterus, underscore the need for proactive management and coordination among healthcare providers. Parents should be reassured about the typically self-limiting nature of breast milk jaundice while being equipped with the knowledge to manage the condition effectively at home. Discharge planning should include comprehensive instructions on infant care and access to follow-up support, such as home visits by lactation consultants where available. Ultimately, the management of breast milk jaundice exemplifies the importance of interdisciplinary care, with nurses at the forefront of ensuring neonatal health and parental well-being. By fostering informed and confident caregiving, nursing professionals play a crucial role in supporting both the physical and emotional aspects of family-centered care.

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اليرقان الناتج عن حليب الأم لدى حديثي الولادة: أدوار التمريض في الاكتشاف المبكر ودعم الوالدين: مراجعة محدثة

المستخلص:

الخلفية: يعتبر اليرقان الناتج عن حليب الأم أحد الأسباب الشائعة لاستمرار ارتفاع نسبة البيليروبين لدى الرضع الذين يرضعون رضاعة طبيعية، ويظهر عادة بعد اليوم الثالث من الولادة. يتطلب ذلك التمييز الدقيق عن الأسباب المرضية الأخرى وتدخلًا تمريضيًا قويًا لضمان الاكتشاف المبكر وتقديم الدعم الفعال للوالدين.

الهدف: تستعرض هذه المراجعة أسباب اليرقان الناتج عن حليب الأم، والعرض السريري، وطرق العلاج، مع التركيز على الأدوار الحيوية للتمريض في الاكتشاف المبكر وثقافة الوالدين وتقديم الدعم.

المنهجية: أجريت مراجعة شاملة للأدبيات الحالية والإرشادات السريرية لتجميع المعرفة حول أسباب وعوامل الخطورة واستراتيجيات إدارة اليرقان الناتج عن حليب الأم.

النتائج: يرتبط اليرقان الناتج عن حليب الأم بمكونات محددة في حليب الإنسان مثل إنزيم  $\beta$ -glucuronidase وعامل نمو البشرة، والتي تعيق اقتران البيليروبين وإخراجه. وتزيد الاستعدادات الجينية، مثل طفرات جين UGT1A1، من قابلية الإصابة. وعلى الرغم من أن الحالة غالبًا ما تكون حميدة وتحسن تلقائيًا، إلا أن الحالات الشديدة قد تتطلب تدخلات مثل العلاج بالضوء أو التوقف المؤقت عن الرضاعة الطبيعية. يلعب التمريض دورًا محوريًا في تقييم شدة اليرقان، ومراقبة مستويات البيليروبين، وتهيئة الوالدين حول تقنيات الرضاعة الطبيعية، وتنسيق الرعاية لمنع مضاعفات مثل اليرقان النووي.

الخلاصة: يعتمد العلاج الفعال لليرقان الناتج عن حليب الأم على التعاون بين التخصصات والرعاية التمريضية الاستباقية. ومن خلال تثقيف ودعم الوالدين، يمكن للممرضين تعزيز استمرارية الرضاعة الطبيعية مع تقليل مخاطر فرط البيليروبين.

الكلمات المفتاحية: اليرقان الناتج عن حليب الأم، فرط البيليروبين لدى حديثي الولادة، أدوار التمريض، دعم الوالدين، إدارة الرضاعة الطبيعية.