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Neonatal jaundice: the same topic, in a new era and an ever-challenging setting

*Icterícia neonatal: o mesmo tema, em um novo tempo e cenário sempre desafiador**Icterícia neonatal: el mismo tema, en una nueva época y en un escenario cada vez más complejo*Gláucia Macedo de Lima^{1,2}

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Neonatal jaundice is the leading cause of readmission to the hospital for newborns (NBs) after discharge from the maternity ward, keeping pediatricians and neonatologists on alert.¹

In the first days of life, indirect bilirubin physiologically acts as an antioxidant; its presence is secondary to hepatic immaturity, associated with a higher red blood cell mass and a shorter half-life of red blood cells. However, elevated indirect bilirubin can cause serious, irreversible damage to the central nervous system because the blood-brain barrier is immature in newborns.¹

Early in my career as a faculty member and clinician in Neonatology, it was common to observe, during autopsies, yellowish staining of the brain's gray matter caused by bilirubin - *kernicterus*, a histopathological lesion of the basal ganglia resulting from bilirubin-induced encephalopathy.¹ This observation motivated my master's (1993) and doctoral (2010) research, a continuous search for evidence to improve pediatric decision-making in the first days of life.

Over the years, the concept, diagnosis, and treatment of hyperbilirubinemia and its complications have evolved.² In this context, current guidelines distinguish between two breastfeeding-related conditions: jaundice due to insufficient milk intake (manifesting in the first days of life, due to low milk supply, dehydration, and weight loss exceeding 7 to 10%) and breast milk jaundice (with a later onset and prolonged course).³

Another development over the years concerns the nomenclature and diagnosis of kernicterus. Now referred to as the kernicterus spectrum disorder (KSD), it ranges from bilirubin-induced neurological dysfunction (BIND) and isolated auditory neuropathy to the classic form with choreoathetosis and sensorineural hearing loss. Diagnosis no longer relies on autopsy and now combines brain magnetic resonance imaging (MRI) showing hyperintensity in the globus pallidus and subthalamic nuclei, brainstem auditory evoked potentials (BAEP), and validated clinical scales, such as the BIND-M.^{3,4}

The diagnostic approach and risk stratification have also been revised. Visual estimation based on the Kramer zones is imprecise and fails critically in dark-skinned newborns or those from ethnic minority groups, delaying diagnosis and perpetuating health disparities. For this reason, objective quantitative measurement via transcutaneous bilirubinometry or serum total bilirubin assay is recommended^{3,5}.

The original article, published in this issue by Hespanha et al., highlights the use of transcutaneous bilirubin assessment as a screening method and reinforces the low sensitivity of visual assessment based on Kramer zones⁶.

From a therapeutic standpoint, Bhutani's single nomogram has been replaced by dynamic phototherapy and exchange transfusion curves stratified by gestational age. Risk factors for neurotoxicity have also been identified: gestational age less than 38 weeks, serum albumin less than 3.0 g/dL, isoimmune hemolytic disease, G6PD deficiency, sepsis, and clinical instability within the past 24 hours. The presence of these factors shifts the therapeutic threshold to lower levels.^{3,5}

Knowledge of the pathophysiology and causes of hyperbilirubinemia, along with a detailed medical history and physical examination, remains essential for early diagnosis, proper monitoring, and appropriate treatment, forming the most effective pillars for protecting newborns.

I conclude this editorial with a list of essential competencies for managing a jaundiced newborn.^{7,8}

1. Proper analysis of the etiopathogenesis of indirect hyperbilirubinemia.
2. Measure bilirubin levels, given the low accuracy of visual assessment for jaundice.
3. Analyze bilirubin levels in relation to weight, gestational age, and hours of life.
4. Consider clinical risk indicators, such as weak sucking, lethargy, and weight loss.
5. Exploratory laboratory workup to monitor non-physiological jaundice.
6. Management of a term or near-term newborn, 48 hours old, with jaundice due to indirect hyperbilirubinemia - watchful waiting, phototherapy, or discharge?
7. Diagnostic evaluation during the outpatient follow-up of a jaundiced newborn at discharge.

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