



Phototherapy: The Role of *Saccharomyces boulardii* in Enhancing Bilirubin Metabolism in Neonates

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DESCRIPTION

Jaundice, characterized by yellowing of the skin and eyes, is a common condition in newborns, especially in premature infants. This condition arises due to elevated levels of bilirubin, a by-product of red blood cell breakdown, which the immature liver of a newborn struggles to process efficiently. Premature infants, due to their underdeveloped organs, are particularly vulnerable to jaundice, which, if severe, can lead to complications such as kernicterus, a type of brain damage. Phototherapy is the standard treatment for jaundice in these infants. Recently, the probiotic *Saccharomyces boulardii* has preserved attention for its potential to enhance the treatment of jaundice.

Understanding neonatal jaundice and phototherapy

Neonatal jaundice occurs when there is an excess of unconjugated bilirubin in the blood. This bilirubin is typically processed by the liver and excreted through bile. However, in premature infants, the liver is often not fully developed, leading to an accumulation of bilirubin. Phototherapy is used to treat this condition, utilizing blue light to convert bilirubin into a water-soluble form that can be excreted *via* urine and stool.

Phototherapy is effective, but it is not without limitations. It requires continuous exposure to light, which can lead to dehydration, electrolyte imbalances, and skin rashes in infants. Hence, there is a need for adjunct therapies that can enhance the efficacy of phototherapy, reduce its duration, and minimize side effects.

The role of probiotics in neonatal health

Probiotics are live microorganisms that presents the health benefits to the host when administered in adequate amounts. *Saccharomyces boulardii*, a non-pathogenic yeast, is one such probiotic known for its gastrointestinal benefits. It has been used to treat various gastrointestinal disorders, including antibiotic-associated diarrhoea, and to enhance gut health.

In neonates, particularly those born prematurely, the gut microbiota is still developing. Introducing beneficial probiotics can aid in establishing a healthy gut flora, which is potential for overall health and development. *Saccharomyces boulardii* has potential in this regard due to its resilience in the gastrointestinal tract and its ability to modulate the immune system.

Saccharomyces boulardii and bilirubin metabolism

The potential impact of *Saccharomyces boulardii* on neonatal jaundice is fixed in its ability to enhance gut motility and improve intestinal barrier function. By promoting healthy gut flora, this probiotic can help accelerate the excretion of bilirubin through faeces, thereby reducing its levels in the bloodstream.

Studies suggest that *Saccharomyces boulardii* may influence the enterohepatic circulation of bilirubin. Enterohepatic circulation refers to the recycling of bile acids and bilirubin between the intestine and the liver. In premature infants, the efficiency of this cycle is arranged. By enhancing gut health and function, *Saccharomyces boulardii* can potentially disrupt this cycle, leading to increased bilirubin excretion and reduced serum bilirubin levels.

Clinical evidence and research

Emerging clinical studies indicates that the administration of *Saccharomyces boulardii* to premature infants undergoing phototherapy can result in more rapid declines in bilirubin levels. In one study, premature infants receiving both phototherapy and *Saccharomyces boulardii* showed a significant reduction in serum bilirubin levels compared to those receiving phototherapy alone. The dual treatment also reduced the duration of phototherapy, minimizing the associated risks and side effects.

The exact mechanisms through which *Saccharomyces boulardii* exerts its effects on bilirubin metabolism are still under investigation. However, it is hypothesized that the probiotic

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enhances the activity of gut enzymes involved in bilirubin conjugation and excretion. Additionally, *Saccharomyces boulardii* may modulate the gut microbiota in a way that favours the breakdown and elimination of bilirubin.

Benefits and safety considerations

The integration of *Saccharomyces boulardii* into the treatment regimen for neonatal jaundice provides several benefits.

Enhanced efficacy: When combined with phototherapy, *Saccharomyces boulardii* may accelerate bilirubin reduction, leading to quicker recovery.

Reduced phototherapy duration: Shortening the duration of phototherapy can decrease the risk of dehydration, electrolyte imbalances, and other adverse effects.

Gut health improvement: As a probiotic, *Saccharomyces boulardii* promotes a healthy gut microbiota, which is potential for the overall development of premature infants.

However, it is essential to consider safety when administering probiotics to neonates. *Saccharomyces boulardii* is generally well-tolerated, but its use in premature infants should be carefully monitored by healthcare providers to prevent potential risks such as fungemia, especially in immunocompromised patients.

Saccharomyces boulardii presents a potential adjunct therapy for the treatment of jaundice in premature infants undergoing phototherapy. By enhancing bilirubin excretion and promoting gut health, this probiotic can potentially reduce the duration and side effects of phototherapy, providing a safer and more effective treatment approach. Further research and clinical trials are necessary to fully understand the mechanisms and optimize the use of *Saccharomyces boulardii* in neonatal care. As the body of evidence grows, *Saccharomyces boulardii* may become a standard component of jaundice management in premature infants, improving outcomes and supporting their delicate health.