

Research Article

Evaluation of miRNA Expression in Pediatric Cirrhosis Caused by BA and PFIC

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Liver cirrhosis is one of the most common causes of death for pediatric patients with cholestasis. Because microRNA (miRNA) plays a part in the pathogenesis of the disease, comparing the changes in miRNA expression in cholestatic patients with liver cirrhosis could be helpful for therapeutic or prognostic purposes. miRNA levels in cirrhotic pediatric patients with progressive familial intrahepatic cholestasis (PFIC) and biliary atresia (BA) were studied in this research to comprehend the molecular distinctions and the significance of miRNA regulation in fibrosis and liver cirrhosis. Blood samples were collected from 43 PFIC patients and 84 BA patients, all of whom were confirmed to have liver cirrhosis. The in-house SYBR Green RT-qPCR techniques were established to assess the variations in the expressions of 12 miRNAs. Utilizing bioinformatics tools, the gene targets of the studied miRNAs were examined. Patients' expression of 12 miRNAs was higher than that of the healthy group. However, there was a notable distinction between the miRNAs in PFIC and BA. The levels of miR-34, miR-155, miR-199, miR-200b, and miR-222 were significantly higher in BA than in PFIC. PFIC showed a significantly higher level of miR-223 than BA. The predictive importance of distinct miRNAs in both diseases was revealed by the AUC values. In BA, miR-222 was associated with both liver transplantation and the PELD score. Death was correlated with miR-21, miR-155, miR-199, and miR-200 in BA and miR-34 in PFIC. The analysis showed the significance of the connection between miRNA expression and PI3K/Akt and TGF- β signaling in pediatric liver cirrhosis. Future investigations can evaluate the significance of the studied miRNAs as novel therapeutic targets and diagnostic options.

Keywords: biliary atresia; cholestasis; liver cirrhosis; microRNA; pediatric; progressive familial intrahepatic cholestasis

1. Introduction

Liver cirrhosis is the ultimate result of cholestasis, a category of liver illnesses that is initially characterized by jaundice and cholestasis. Cholestasis can be classified as either biliary atresia (BA) or non-BA, including progressive familial intrahepatic cholestasis (PFIC) [1, 2]. BA, the most prevalent liver condition in infancy, is a major contributor to obstructive jaundice and can result in a high newborn mortality rate [3]. BA has a 2-year lethal potential if left untreated. The disease begins with a destructive inflammation of the liver, which progresses to fibrosis and cirrhosis. Because of grow-

ing liver fibrosis, Kasai portoenterostomy (KPE), the most significant treatment for BA, seldom succeeds, and most patients eventually need a liver transplant [4]. PFIC is caused by autosomal recessive mutations that interfere with the function of liver cells in forming and excreting bile [5]. Cholestasis and subsequent outcomes are the usual symptoms of the condition throughout the first year of life. In the first few months after birth, it frequently presents as severe pruritus, slowed weight gain, malnourishment, cholestatic jaundice, and hypocholesterolemia [6]. Both BA and PFIC cholestatic disorders typically develop into fibrosis and cirrhosis prior to adulthood. The management of

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