the disease, from endoscopic treatment to liver transplantation in end-stage patients [35].

Alpha-1-antitrypsin deficiency produces a picture combining findings of cholestatic and postnecrotic cirrhosis. It is the most common indication for liver transplantation from metabolic diseases in the Western hemisphere. Although some improvement of liver function tests has been reported with the use of ursodeoxycholic acid, at the present, there is no effective treatment for this condition, and management of affected patients is restricted to the complications of ongoing cirrhosis, using the same principles described for other etiologies [36].

Budd-Chiari Syndrome encompasses a series of different causes producing obstruction to the hepatic venous outflow. These patients tend to present with hepatomegaly and ascitis rather than with variceal hemorrhage, but those developing secondary cirrhosis can experiment bleeding from esophageal varices. Management is very complex, strongly influenced by the clinical picture (acute versus chronic), etiology, and extent of the liver damage. In contrast with portal vein obstruction, most Budd-Chiari patients have an associated thrombophilic state that has to be accurately investigated and treated [37].

4. Treatment

4.1. Prevention of the First Bleed (Primary Prophylaxis). Avoiding the morbidity and mortality associated with the first bleed from esophageal varices is the rationale behind primary prophylaxis. Clear recommendations exist for the adult population, but unfortunately this is not the case for pediatric patients [38]. Application of such strategy should comply with two premises: correct identification of the population "at risk" and availability of an effective treatment. In spite of many efforts, achieving the first goal has been elusive, owing to the heterogeneity of the population with portal hypertension in pediatric ages [39]. Stratifying patients at risk according to specific etiologies could be the best way to manage this problem [17]. Regarding the second goal, the absence of controlled randomized trials in primary prophylaxis of esophageal varices bleeding in children makes any recommendation problematic and debatable. Low number of patients and difficulties in recruitment are major obstacles to the realization of such studies, as seen with the use of propranolol in children, which is in strong contrast to the adult population. A group of expert analyzed possibilities on primary prophylaxis of variceal hemorrhage in children, concluding that future research should focus on the natural history, diagnosis of varices, prediction of variceal bleeding, and explore therapeutic efficacy of different protocols [40].

Currently, it remains intuitive to offer endoscopic obliteration to patients with high-risk varices who had never bled, preferably by band ligation. Endoscopic examination should be only offered to patients when decision to proceed with sclerotherapy or banding has already been taken in advance [5, 20].

Data in children with cirrhosis secondary to biliary atresia showed that esophageal varices developed very early in life in 70% of them. In addition, endoscopic signs indicating a high risk of mediate bleeding were found in 30% of those with esophageal varices [20]. Another recent study, on a similar population, showed that grade II-III varices developed with similar frequency after failed and successful portoenterostomy, but, following failed portoenterostomy, esophageal varices were encountered significantly earlier [41]. The authors recommended that after failed portoenterostomy surveillance should start early, for example, at six months of age [41].

There are different approaches in the care of children at risk for esophageal varices bleeding among pediatric gastroenterologists, most of them based on personal preferences and local expertise rather than strong evidence. In addition, attitudes from parents could be different from those of physicians; a high percentage of them would accept an endoscopy to be carried out in their children if a prophylactic treatment can avoid bleeding or even to establish the current risk of bleeding in the absence of treatment [42].

4.2. Acute Bleeding. Acute bleeding is the most feared complication of portal hypertension, with an associated mortality up to 20%, mainly in patients with affected liver function [43]. As a consequence, focus on treatment has been directed to the control of hemorrhagic episodes, reaching a rate of success higher than 90% in recent years.

Volume resuscitation initiated without delay, should restore hemoglobin levels to around 8 g%, and insure good perfusion of vital organs with plasma expanders. Overzealous use of volume/plasma expanders should be avoided, however, because of the theoretical risk of rebound portal hypertension and rebleeding [38].

Antibiotics directed at the intestinal flora should be part of the treatment from the beginning [38], as well as vasoactive drugs, preferably by the intravenous route. Among many drugs tested in adult patients, octreotide has been the most widely used in children, at a dose of 1-2 ug/Kg by bolus over 20 minutes, followed by continuous infusion at 2 ug/Kg/h, maintained for 2 to 5 days [44]. Its use in this setting has been advocated to promote easier and safer endoscopic procedures [20].

Once stabilized, patients should be treated by direct approach of the varices, either with band ligation or sclerosant injection. Both treatments are highly effective in controlling the acute episode, and the choice of one particular method depends on the local expertise and other technical issues. In a general sense, endoscopic variceal ligation is preferred in most cases, owing to its simplicity and lower rate of complications, but sclerotherapy is probably easier to implement during active bleeding, and is the best option in small children [45, 46]. Ideally, the operator should master both techniques and have all appropriate tools available during the procedure.

Despite the high rate of success achieved with these approaches: in 5 to 10% of cases bleeding cannot be controlled, and rescue therapy is needed, usually after the failure of a second attempt by endoscopy. This rescue therapy involves a surgical option, or a radiological approach (TIPS),