

Evaluation of endoscopic secondary prophylaxis in children and adolescents with esophageal varices

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ABSTRACT – Background – Bleeding of esophageal varices is the main cause of morbidity and mortality in children and adults with portal hypertension and there are few studies involving secondary prophylaxis in children and adolescents. **Objective** – To evaluate the efficacy of endoscopic secondary prophylaxis in prevention of upper gastrointestinal bleeding in children and adolescents with esophageal varices. **Methods** – This is a prospective analysis of 85 patients less than 18 years of age with or without cirrhosis, with portal hypertension. Participants underwent endoscopic secondary prophylaxis with sclerotherapy or band ligation. Eradication of varices, incidence of rebleeding, number of endoscopic sessions required for eradication, incidence of developing gastric fundus varices and portal hypertensive gastropathy were evaluated. **Results** – Band ligation was performed in 34 (40%) patients and sclerotherapy in 51 (60%) patients. Esophageal varices were eradicated in 81.2%, after a median of four endoscopic sessions. Varices relapsed in 38 (55.1%) patients. Thirty-six (42.3%) patients experienced rebleeding, and it was more prevalent in the group that received sclerotherapy. Gastric varices and portal hypertensive gastropathy developed in 38.7% and 57.9% of patients, respectively. Patients undergoing band ligation showed lower rebleeding rates (26.5% vs 52.9%) and fewer sessions required for eradication of esophageal varices (3.5 vs 5). **Conclusion** – Secondary prophylaxis was effective in eradicating esophageal varices and controlling new upper gastrointestinal bleeding episodes due to the rupture of esophageal varices. Band ligation seems that resulted in lower rebleeding rates and fewer sessions required to eradicate varices than did sclerotherapy.

HEADINGS – Esophageal and gastric varices. Portal hypertension. Ligation. Sclerotherapy. Child. Adolescent.

INTRODUCTION

Bleeding of esophageal varices is the main cause of morbidity and mortality in children and adults with portal hypertension (PH)⁽¹³⁾. Despite therapeutic advances, mortality due to acute episodes of upper gastrointestinal bleeding (UGIB) secondary to esophageal varices occurs in 5%-19% of children with PH^(1,3,5,10,12,22). Mortality rates of 19% have been reported within 35 days after episodes of bleeding varices among North American children with liver disease of several etiologies⁽⁵⁾. Thus, it is essential to establish measures to prevent new UGIB episodes due to rupture of varices in these patients.

According to the Baveno V Consensus Workshop, which involved adult patients with cirrhosis, treatment with beta-blockers in combination with band ligation is the most efficient method of secondary prophylaxis, although such results and recommendations cannot be extrapolated to patients in the pediatric age group^(1,2,3,4,5,10,12,13,14,22).

Studies involving secondary prophylaxis in children and adolescents are predominantly case series. According to current recommendations, endoscopic band ligation is the method of

choice for children and adolescents, and beta-blocker therapy is not recommended^(6-9,11,14-18,20,24-26). Both band ligation and sclerotherapy have high rates of variceal eradication, approximately 80%-100%, and rebleeding rates of 0-30%^(6-9,11,14-17,24,26). Zargar et al. performed a randomized pediatric study comparing band ligation and sclerotherapy in children, achieving better results in the band group⁽²⁵⁾.

Secondary prophylaxis should always be used in children^(16,20). However, additional studies are necessary to determine the best type of prevention. The present study aims to describe the results of endoscopic therapy as secondary prophylaxis in children and adolescents with UGIB due to esophageal varices followed at the Hospital das Clínicas, Universidade Federal de Minas Gerais (HC-UFGM).

METHODS

We performed a prospective evaluation of 85 children and adolescents undergoing secondary prophylaxis after an episode of upper digestive bleeding due to rupture of esophageal varices. The study was performed between January 2004 and December 2014 at HC-UFGM.

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Participants

Patients <18 years old with portal hypertension who had an UGIB episode due to rupture of esophageal varices and underwent secondary prophylaxis according to the protocol established by the service were included in the study. Exclusion criteria included non-adherence to the protocol for secondary prophylaxis.

Protocol

Patients with UGIB secondary to esophageal varices, after managing the acute episode, were referred our service to undergo endoscopic secondary prophylaxis: band ligation is the procedure of choice for endoscopic secondary prophylaxis except in patients in whom the procedure is technically not possible, usually in small patients and children under two years. In such cases sclerotherapy is the procedure adopted as a form of secondary prophylaxis. Endoscopic prophylaxis was initiated two weeks after the UGIB episode. Upper digestive endoscopy (UDE) was performed at the Digestive Endoscopy Unit at the Instituto Alfa de Gastroenterologia of HC-UFGM by three pediatric endoscopists who, for most procedures, were all present during the exam. The varices were classified according to the Japanese classification (Japanese Research Society for Portal Hypertension, 2a edition)⁽²³⁾: grade I (small caliber): small varicose veins, not tortuous; grade II (medium caliber): slightly enlarged and tortuous varices, occupying less than a third of the esophageal lumen; grade III (large caliber): nodular varicose veins, similar to rosary beads, occupying more than a third of the esophageal lumen. In patients with varices of different sizes, the one with the largest caliber was used for classification.

Gastric varices were classified as esophagogastric varices extending to small curvature (GEV1S type), esophagogastric varices extending to the gastric fundus (GEV2S type), isolated gastric fundus varices (IGV1S) or gastric fundus and/or duodenum varices (IGV2S)⁽¹⁹⁾.

The presence of red spots and portal hypertensive gastropathy were investigated in each endoscopic examination, and were classified as present or absent. Variable gastropathy was described as mild if there was a mosaic pattern of mild grade without any red spots, and described as severe when the mosaic pattern was superimposed by red spots or if any other red spots were present. Gastric antral vascular ectasia was reported when aggregates of red spots arranged in a linear pattern or diffuse lesions were found^(18,21).

Band ligation was performed using the multiband ligator. The band began next to the gastroesophageal junction, moving cranially with a distance of 5 cm. In each session, the varicose vein was tied using an elastic band, and all identified varices were treated.

Sclerotherapy was performed in patients who technically was not possible to carry out the band ligation, with a transparent Teflon injector (diameter 23), using a free-hand technique. The injections were made both intravascularly and in the perivascular space, and the sclerosing agent used was 3% ethamolin. The injected amount ranged between 1 and 2 mL per varicose vein, with a maximum of 10 mL per session, according to the size of the vessels. All identified varices underwent sclerotherapy.

Patients underwent endoscopy every three weeks until all varices were eradicated. After eradication, UDE was performed quarterly for the first 6 months, then every six months and, if they remained

without varices, annually. UDE was performed acutely to manage any episodes of UGIB.

Clinical follow-up was carried out at the Pediatric Hepatology Clinic of HC-UFGM. The diagnosis of cirrhosis and congenital hepatic fibrosis was based on clinical and histological evaluation. Diagnosis of extrahepatic portal vein obstruction was confirmed through Doppler ultrasonography of hepatic vessels. All patients underwent laboratory tests at the time of consultation to evaluate liver biochemistry (aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, gamma glutamyl transferase) and function (prothrombin activity, albumin), blood counts including platelet counts, and other exams when pertinent to the patient's condition. Patients with cirrhosis were classified according to the Child-Pugh criteria at the beginning of secondary prophylaxis.

Term definitions (studied variables)

Eradication: when all visible varices had been thrombosed by sclerotherapy or were too thin for suction in band ligation, or when absent.

Rebleeding: occurrence of an UGIB episode by rupture of esophageal varices, after beginning prophylaxis, with clinical repercussions and in need of urgent UDE.

Early: rebleeding during prophylaxis and before eradication (not associated with complications of the endoscopy procedure).

Late: rebleeding after eradication.

Relapse: reappearance of varices needing endoscopic treatment in a patient who had already had all varices eradicated.

Appearance of portal hypertensive gastropathy: gastropathy emergence in a patient who did not have it at the first UDE prior to prophylaxis.

Appearance of gastric varices: emergence of gastric fundus varices (GEV2, IGV1, IGV2) in a patient who did not have them at the first UDE prior to prophylaxis.

Statistical analysis and ethical aspects

The database was developed and analyzed using the SPSS 17 program. Continuous variables with normal distribution were evaluated using Student's t test and expressed as mean and standard deviation (SD). Continuous variables without normal distribution were expressed through median and interquartile range (IR) (25%-75%) and compared using the nonparametric Kruskal-Wallis test. The comparison of the distribution of dichotomous variables was analyzed through the chi-square test, with Yates correction or Fisher's exact test, two-tailed, if necessary. The probability of significance was considered significant when less than 0.05 ($P < 0.05$). This study has been approved by the Ethics Research Committee of UFGM.

RESULTS

Patients characteristics

Eighty-five patients who underwent the endoscopic secondary prophylaxis were included in this study. Forty-four (51.8%) of them were girls with a median age of 5.7 years at the time of the first bleeding episode (IR 25%-75%, 2.2-8.8). Portal hypertension was caused by cirrhosis in 37 (43.5%) patients, extrahepatic portal vein obstruction (EHPVO) in 37 (43.5%) and congenital hepatic fibrosis (CHF) in 11 (13.0%) (Table 1).

TABLE 1. Clinical and endoscopic characteristics of patients with and without cirrhosis at the beginning of secondary prophylaxis

	Cirrhosis n = 37	Without cirrhosis n = 48	P
Sex			0.057
Male	13 (35.1%)	28 (58.3%)	
Female	24 (64.9%)	20 (41.7%)	
Age at first UGIB episode (years)			
Median	6.8years	5.4 years	
25%-75%	1.9-8.8	2.6-8.6	0.626
Caliber of esophageal varices			
Small caliber	6 (16.2%)	6 (12.5%)	
Medium caliber and/or large caliber	31 (88.8%)	42 (87.5%)	0.860
Gastric varices	25 (67.6%)	29 (60.4%)	0.650
Portal hypertensive gastropathy	15 (40.5%)	13 (27.1%)	0.281

The median age at UGIB was 6.8 years (IR 25%-75%: 1.9-8.8) among the patients with cirrhosis, and in patients with cirrhosis secondary to biliary atresia the median was 2.9 years (IR 25%-75%: 1.6-4.6) and in those with cirrhosis by autoimmune hepatitis 8.2 years (IR 25%-75%: 6.1-10.5) ($P=0.26$). In the non-cirrhosis group, the median was 5.4 years (IR 25%-75%: 2.6-8.6) ($P=0.626$). In patients with EHPVO and CHF, the median age was 4.7 (IR 25%-75%: 2.2-8.0) and 7.5 years (IR 25%-75%: 6.5-10.7), respectively.

In those with cirrhosis, the most frequent cause was biliary atresia in 14 (37.8%) patients, followed by cryptogenic cirrhosis in 8 (21.6%), primary sclerosing cholangitis in 5 (13.5%) and autoimmune hepatitis in 5 (13.5%). Other causes included alpha-1 antitrypsin deficiency in 3 (8.1%), Budd-Chiari syndrome in 1 (2.7%) and choledochal cyst in 1 (2.7%).

The UDE performed at the beginning of secondary prophylaxis showed esophageal varices of small caliber in 12 (14.1%) patients, medium caliber in 37 (43.5%) patients and large caliber in 36 (42.4%) patients. In 46 (54.1%) patients there were signals suggestive of bleeding (red spots). Gastric varices were observed in 54 (63.5%) patients and portal hypertensive gastropathy in 28 (32.9%) patients.

Evaluation of secondary prophylaxis

Analyzing the whole group, eradication of esophageal varices was achieved in 69 (81.2%) patients, requiring a median of four endoscopic sessions for eradication (IR 25%-75%: 2-6). Varices relapsed in 38 (44.7%) patients. The esophageal varices were eradicated in 70.3% of those in the cirrhosis group and in 89.6% of patients without cirrhosis (Table 2 and 3).

TABLE 2. Evaluation of secondary prophylaxis comparing patients with and without cirrhosis (n = 85)

	Cirrhosis n = 37	Non cirrhosis n = 48	Total n = 85	P value
Eradication of varices	26 (70.3%)	43 (89.6%)	69 (81.2%)	0.047
Number of endoscopic sessions for eradication				
Median (IR 25%-75%)	4 (2-5.8)	5 (3-6)	4 (2-6)	0.251
Relapse of esophageal varices	14 (53.8%)	24 (55.8%)	38(55.1%)	0.369
Rebleeding	15 (40.5%)	21 (43.8%)	36 (42.3%)	
Early	13	15	28	0.939
Late	2	6	8	0.498
Presence of gastropathy at the beginning of secondary prophylaxis	15 (40.5%)	13 (27.1%)	28 (32.9%)	0.281
Appearance of gastropathy during secondary prophylaxis	10 (45.5%)	23 (65.7%)	33 (57.9%)	0.217
Presence of gastric varices at the beginning of secondary prophylaxis	25 (67.6%)	29 (60.4%)	54 (63.5%)	0.651
Appearance of gastric varices during secondary prophylaxis	7(58.3%)	5 (26.3%)	12 (38.7%)	0.966
Death	9(24.3%)	1 (2.1%)	10 (11.8%)	0.004
Follow up				
Median (years)	5.9	7.5	6.6	
IR 25%-75%	3.1-8.9	5.1-12.5	3.8-10	0.072

IR: interquartile range

TABLE 3. Results of secondary prophylaxis for patients with portal hypertertion (n = 85)

	Cirrhosis n = 37	EHPVO n = 37	CHF n = 11	Total n = 85
Endoscopic method				
Band Ligation	15 (40.5%)	14 (37.8%)	5 (45.5%)	34 (40%)
Sclerotherapy	22 (59.5%)	23 (62.2%)	6 (54.6%)	51 (60%)
Eradication of varices	26 (70.3%)	34 (91.9%)	9 (81.8%)	69 (81.2%)
Number of endoscopic sessions				
Median (IR 25%-75%)	4 (2-5.8)	5 (3-6.8)	5 (3-5)	4 (2-6)
Relapse of esophageal varices	14 (53.9%)	18 (52.9%)	6 (66.7%)	38 (55.1%)
Rebleeding	n = 15 (40.5%)	n = 14 (37.8%)	n = 7 (63.6%)	n = 36 (42.4%)
Early	13 (86.7%)	10 (71.4%)	5 (71.4%)	28 (77.8%)
Late	2 (13.3%)	4 (28.6%)	2 (28.6%)	8 (22.2%)
Appearance of gastropathy	10 (45.5%)	16 (57.1%)	7 (100.0%)	33 (57.9%)
Appearance of fundus varices	7 (58.3%)	5 (27.8%)	0	12 (38.7%)
Death	9 (24.3%)	0	1 (9.1%)	10 (11.8%)
Follow up (years)				
Median (IR 25%-75%)	5.9 (3.1-8.9)	6.6 (3.8-10.1)	11.3 (7.8-13.2)	6.6 (3.8-10)

EHPVO: extrahepatic portal vein obstruction; IR: interquartile range.

Of the 36 (42.4%) patients with rebleeding, 28 (77.8%) occurred before completion of the endoscopic sessions for secondary prophylaxis (early bleeding) and 8 (22.2%) after the varices were eradicated (late bleeding). The median time between the eradication and rebleeding was 1.4 years (IR 25%-75%: 0.7-2.9). There were no bleeding episodes between management of the acute bleeding and the beginning of secondary prophylaxis.

Gastric fundus varices appeared in 12 (38.7%) patients among the 31 who did not have them at the beginning of secondary prophylaxis, and portal hypertensive gastropathy appeared in 33 (62.3%) patients of the 53 that did not have it at the beginning of prophylaxis.

Ten deaths occurred during the study, nine of them in the cirrhosis group (24.3%). Six patients died due to complications secondary to UGIB and three from complications after liver transplant. Esophageal stenosis was observed due to the endoscopic procedure in four (4.7%) patients: three had sclerotherapy and one had band ligation. All were treated with dilation, which reversed the stenosis. It was not assessed dysphagia after endoscopic procedures.

The results of secondary prophylaxis for the patients with portal hypertension are described in Tables 2 and 3.

Evaluation of endoscopic prophylaxis with relation to the method used

For secondary prophylaxis, 51 (60%) patients underwent sclerotherapy and 34 (40%) underwent band ligation. In those who underwent sclerotherapy, varices were eradicated in 41 (80.4%) patients in a median of five endoscopic sessions. Varices recurred in 25 (60.9%) patients, and in 11 (44%) of them, the recurrent varices were eradicated during further endoscopic procedures. Rebleeding causing clinical consequences occurred in 27 (52.9%) patients, 23 (85.2%) instances of which occurred between endoscopic sessions and 4 (14.8%) after varices were eradicated.

In those who received band ligation, varices were eradicated in 28 (82.4%) patients after a median of 3.5 endoscopic sessions. Varices recurred in 13 (46.4%) of them, and were subsequently

re-eradicated in six (46.1%). Rebleeding occurred in nine (26.5%) patients, five (55.6%) of which occurred between endoscopic sessions and four (44.4%) after varices were eradicated. The comparative results between the methods used for secondary prophylaxis are shown in Table 4.

TABLE 4. Comparison between band ligation and sclerotherapy

	Band ligation n = 34	Sclerotherapy n = 51	P
Sex			
Male	14 (41.2%)	27 (52.9%)	0.399
Female	20 (58.8%)	24 (47.1%)	
Age at diagnosis (years)			
Median	5.9	2.4	0.005
IR 25%-75%	2.5-8.8	1.1-5.5	
Number of sessions for eradication			
Median	3.5	5.0	0.006
IR 25%-75%	2-5	3-8	
Relapse of esophageal varices	13 (46.4%)	25 (61.0%)	0.344
Time to relapse			
Median (month)	12.98	16.0	0.051
IR 25%-75%	8.9-22.2	9.3-26.1	
Rebleeding	9 (26.5%)	27(52.9%)	
Early	5	23	0.028
Late	4	4	0.164
Appearance of gastropathy	19	38	0.393
IR 25%-75%	13 (68.4%)	20 (52.6%)	
Appearance of fundus varices	14	17	0.952
IR 25%-75%	5 (35.7%)	7 (41.2%)	

IR: interquartile range.

DISCUSSION

Secondary prophylaxis aims to prevent new UGIB episodes, and it is already well established that both adults and children should be treated^(4,20). Data of studies done with adults cannot be extrapolated to the pediatric age group since, in adults, the main cause of PH is liver cirrhosis, while in pediatric patients, half of cases are due to EHPVO, whose clinical evolution is different from that of cirrhosis and in whom the hepatocellular function is preserved^(1,10). Furthermore, comorbidities are common in adults and can increase morbidity and mortality in this age group. Another factor that differs among groups is the hemodynamic response to bleeding or drugs^(1,10,18,20). This study aims to contribute our experience to that described in the literature of endoscopic secondary prophylaxis in children and adolescent who had UGIB secondary to esophageal varices^(6-9,11,14,15-18,20,24-26).

Regarding the approach for secondary prophylaxis in adults with cirrhosis, non-selective beta blockers associated with band ligation should be used⁽⁴⁾. Sclerotherapy, despite effectively eradicating varices, is used less because of higher complication rates than those with band ligation^(4,20). In children, according to opinion of pediatric experts on the Baveno V consensus committee, secondary prophylaxis should be performed with endoscopic therapy, and rubber band ligation has been the preferred method. Drug therapy with beta blockers is not recommended, as studies proving its utility in children have yet to be performed⁽²⁰⁾.

Analyzing the whole evaluated group, eradication of esophageal varices was achieved in 81.2%, which is within the reported 80%-100% range for endoscopic therapy in pediatric patients for both band ligation and sclerotherapy^(6-9,11,14-17,24,26).

Several studies demonstrated the effectiveness of endoscopic sclerotherapy for preventing new UGIB episodes in children with PH^(8,14,15,24,26). Poddar et al. followed 207 children with EHPVO, and varices were eradicated in 95% of them, after a mean of 4.5 endoscopic sessions⁽¹⁴⁾. Itha et al. described 163 children with EHPVO provided secondary prophylaxis with sclerotherapy, in whom esophageal varices were eradicated in 80% after a mean of 7.6 endoscopic sessions⁽⁸⁾. In the present study, sclerotherapy eradicated esophageal varices in 80% of patients, after a median of five sessions, similar to reported data for pediatric patients.

Relapse of esophageal varices is reported in the pediatric literature with a frequency of 10%-40% of cases after the use of sclerotherapy as secondary prophylaxis^(8,14,15,24,26). However, a higher rate of relapse of esophageal varices (61%) was observed in the present study. The rebleeding rate observed (52.9%) in this study was also higher than has been described in the literature (0-12%)^(8,14,15,24,26). This difference may reflect the fact that the group treated with sclerotherapy had a lower median age lower than that of the studies mentioned, and in this group of patients it was not possible to perform band ligation because the ligature device could not pass by the cricopharyngeus. The lower age may predispose to a higher frequency of rebleeding.

Similar to what has already been observed in other studies^(8,14), both portal hypertensive gastropathy and gastric fundus varices arose frequently after eradication of esophageal varices with sclerotherapy. The present findings are consistent with those of Itha et al., who followed 163 children with EHPVO who were given secondary prophylaxis with sclerotherapy⁽⁸⁾, and Poddar et al., who followed 274 children with EHPVO also given secondary prophylaxis with sclerotherapy⁽¹⁴⁾.

Portal hypertensive gastropathy and gastric fundus varices may arise after secondary prophylaxis because endoscopic therapy does not alter the blood pressure in the portal system. Thus the eradication of esophageal varices may lead to redistribution of blood flow to other portal system sites, explaining the increased incidence of gastric varices and portal hypertensive gastropathy. However, UGIB due to bleeding of these sites is more difficult to approach endoscopically. These patients may be the ones who most benefit from drug therapy, since propranolol reduces blood pressure in the entire portal system. However, further studies are necessary to confirm this hypothesis.

In 2002, Mckiernan et al. first described the use of a multiband ligator in children⁽¹¹⁾. They eradicated esophageal varices after a median of two sessions with a success rate of 92.8%. On the other hand, Karrer et al.⁽⁹⁾ and Fox et al.⁽⁶⁾ needed a mean of four sessions to eradicate varices, similar to the present study, in which band ligation eradicated varices in 82% of patients after a median of 3.5 endoscopic sessions. In the literature, relapse of varices after band ligation in children is highly variable, between 9% and 75%^(6,7,9,11,16,17), and our findings fit within that range. Early and late rebleeding rates were similar to those published, approximately 7%-27%^(6,7,9,11,16,17). The rates at which PH gastropathy and gastric varices developed were also high, at 68.4% and 35.7% respectively.

In adults, the superiority of band ligation relative to sclerotherapy in secondary prophylaxis of esophageal varices is well-established⁽⁴⁾. Zargar et al. compared 25 children treated with band ligation to 24 children treated with sclerotherapy⁽²⁵⁾. Band ligation required fewer endoscopic sessions to eradicate varices, had lower rates of early rebleeding (4% vs 25%: $P=0.049$) and had fewer major complications (esophageal ulcer, stenosis and pneumonia) than sclerotherapy (4% vs 25%: $P=0.049$). The authors concluded that band ligation has significant advantages over sclerotherapy in terms of effectiveness and safety, and it should be the first choice for to eradicate varices⁽²⁵⁾.

Both methods were equally effective at eradicating esophageal varices, but with a statistically significant difference in the number of sessions required, where band ligation achieved early eradication, which is in agreement with the results of Zagar et al.⁽²⁵⁾. Another difference observed was the higher early rebleeding rate in the sclerotherapy group, as demonstrated in other studies^(4,25). However, this comparison has limitations, as the study was not randomized, which also was the case with most pediatric studies^(6-9,11,14-17,24,26). The group treated with sclerotherapy also had a lower median age than the group treated with band ligation. The lower median age in the sclerotherapy group reflects the greater difficulty in performing band ligation for younger patients, which limits the comparison. This difference also can be related to the technique required for sclerotherapy, which might require a higher frequency of perivascular injections and fewer intravascular injections, necessitating more sessions for eradication and higher rebleeding rates during secondary prophylaxis.

A higher rate of esophageal varices eradication (89.6%) was observed in patients without cirrhosis, while varices were eradicated in 70.3% of patients with cirrhosis. The probable reason eradication was achieved in fewer patients with cirrhosis is that cirrhosis is progressive, with consequent worsening of liver function and evolution of PH, which does not occur in non-cirrhotic etiologies of PH. This theory can be strengthened when the deaths in the studied group are examined, since 90% of deaths happened in the cirrhosis group.

Endoscopic secondary prophylaxis is effective in controlling new episodes of UGIB due to rupture of esophageal varices in patients both with and without cirrhosis, regardless of the endoscopic technique used. However, portal hypertensive gastropathy and fundic varices clearly arise after eradication of esophageal varices. High rates of relapse of esophageal varices and of rebleeding were observed, but these events were well-controlled with new additional endoscopic treatment. Thus, band ligation and sclerotherapy are acceptable methods for secondary prophylaxis in childhood, although higher rebleeding rates were observed in the sclerotherapy group. However,

this fact that should be interpreted with caution, since it arises from a non-randomized study. Further randomized studies with more subjects are required to make a reliable conclusion on the subject.

Authors' contributions

Pimenta JR: implementation of research, writing and statistical analysis. Ferreira AR: implementation of research, writing and statistical analysis. Bittencourt PFS: search execution. Fagundes EDT: search execution. Moura AM: data collection. Carvalho SD: search execution.

Pimenta JR, Ferreira AR, Fagundes EDT, Bittencourt PFS, Moura AM, Carvalho SD. Avaliação da profilaxia secundária endoscópica em crianças e adolescentes com varizes de esôfago. *Arq Gastroenterol.* 2017;54(1):21-6.

RESUMO – Contexto – Os episódios de sangramento das varizes esofágicas são a principal causa de morbidade e mortalidade em crianças e adultos com hipertensão porta e poucos são os estudos envolvendo a profilaxia secundária em crianças e adolescentes. **Objetivo** – Avaliar a eficácia da profilaxia endoscópica secundária na prevenção de hemorragia digestiva alta em crianças e adolescentes com varizes de esôfago. **Métodos** – Estudo prospectivo com 85 pacientes menores de 18 anos com hipertensão porta, cirróticos e não cirróticos. A profilaxia secundária endoscópica foi realizada através de ligadura elástica ou escleroterapia. Foram avaliadas erradicação de varizes, incidência de ressangramento, número de sessões endoscópicas necessárias para a erradicação, incidência de surgimento de varizes gástricas e da gastropatia da hipertensão porta. **Resultados** – Ligadura elástica foi realizada em 34 (40%) pacientes e escleroterapia em 51 (60%). As varizes de esôfago foram erradicadas em 81,2% após mediana de quatro sessões endoscópicas. Foi observada recidiva de varizes de esôfago em 38 (55,1%) pacientes. Ressangramento por ruptura de varizes de esôfago ocorreu em 36 (42,3%) pacientes e foi mais prevalente no grupo submetido à escleroterapia. O surgimento de varizes gástricas e gastropatia da hipertensão porta ocorreram em 38,7% e 57,9% respectivamente. Os pacientes submetidos à ligadura elástica apresentaram taxas menores de ressangramento (26,5% vs 52,9%) e número menor de sessões necessárias para erradicação das varizes de esôfago (3,5 vs 5). **Conclusão** – A profilaxia secundária endoscópica mostrou-se eficaz para erradicação de varizes de esôfago e evitar novos episódios de hemorragia digestiva alta secundária à ruptura de varizes de esôfago. A ligadura elástica endoscópica provavelmente apresenta menores taxas de ressangramento e número menor de sessões necessárias para erradicação das varizes de esôfago, quando comparada à escleroterapia.

DESCRITORES – Varizes esofágicas e gástricas. Hipertensão portal. Ligadura. Escleroterapia. Criança. Adolescente.

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