



Comparison of Hirschsprung-associated enterocolitis following Soave and Duhamel procedures☆☆☆



Isidora Galuh Parahita, Akhmad Makhmudi, Gunadi *

Pediatric Surgery Division, Department of Surgery, Faculty of Medicine, Universitas Gadjah Mada/Dr. Sardjito Hospital, Yogyakarta 55281, Indonesia

ARTICLE INFO

Article history:

Received 17 April 2017

Received in revised form 21 June 2017

Accepted 10 July 2017

Key words:

Duhamel

HAEC following pull-through

Hirschsprung

Pre-operative enterocolitis

Soave

ABSTRACT

Background: Hirschsprung-associated enterocolitis (HAEC) represents the primary cause of high morbidity and mortality in Hirschsprung disease (HSCR) patients. The most common surgical methods for HSCR are the Soave and Duhamel procedures. Therefore, we aimed to compare the HAEC frequency following the Soave and Duhamel procedures.

Methods: Medical records were retrospectively analyzed for patients who underwent the Soave and Duhamel pull-through at Dr. Sardjito Hospital, Indonesia from 2010 to 2015. The diagnosis of HAEC was determined using a HAEC scoring system.

Results: One hundred patients were involved (Soave: 52 males and 19 females vs. Duhamel: 23 males and 6 females, $p = 0.62$). There was significant difference in mean age at pull-through (Soave: 29.9 ± 45.2 vs. Duhamel: 50.8 ± 47.5 months, $p = 0.04$), whereas mean age of HSCR diagnosis and pre-operative enterocolitis frequency did not differ significantly between groups (Soave: 25.4 ± 41.0 vs. Duhamel: 43.7 ± 48.1 months, $p = 0.06$, and Soave: 7% vs. Duhamel: 14%, $p = 0.44$, respectively). The HAEC frequency after pull-through was significantly higher in the Duhamel than the Soave group (28% vs. 10%, respectively, $p = 0.03$). Furthermore, pre-operative enterocolitis showed a significant association with HAEC following pull-through ($p = 2.0 \times 10^{-4}$) and the risk of HAEC after Soave pull-through was increased in long-segment aganglionosis compared to short-segment HSCR ($p = 0.015$).

Conclusions: The frequency of HAEC was significantly higher after the Duhamel than the Soave procedure. Moreover, patients with pre-operative enterocolitis are prone to have HAEC following pull-through.

Level of evidence: III

© 2017 Elsevier Inc. All rights reserved.

1. Background

Hirschsprung disease (HSCR), which is characterized by the absence of ganglion cells (Meissner and Auerbach) along variable lengths of the intestines, is a common cause of functional intestinal obstruction in children [1,2]. This disorder can be classified as follows: (1) short-segment, (2) long-segment, and (3) total colonic aganglionosis (TCA), with an overall male:female ratio of 4:1 [1].

Hirschsprung-associated enterocolitis (HAEC) represents the primary cause of high morbidity and mortality in HSCR patients [3]. There are several hypotheses for the cause of HAEC involving: dysbiosis of the

intestinal microbiome, compromised mucosal barrier function, changed innate immune responses, and translocation of bacteria [3]. HAEC might occur prior to pull-through procedure or after definitive repair [3–5].

The current treatment for HSCR is surgical resection of the aganglionic segment of the bowel. The most common operative methods for HSCR are the Soave and Duhamel procedures [6–10]. Therefore, we aimed to compare the frequency of HAEC following the Soave and Duhamel techniques.

2. Material and methods

2.1. Patient samples

We conducted a retrospective study of children <18 years of age with HSCR at the Pediatric Surgery Division, Department of Surgery, Dr. Sardjito Hospital in Yogyakarta, Indonesia, from January 2010 to October 2015. Dr. Sardjito Hospital is a University Teaching Hospital and as a tertiary referral center, it serves urban and rural populations not only from Yogyakarta province but also from the southern parts of the Java Island [11].

* The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

☆☆ Author contributions: IGP, AM, and G conceived the study. IGP and G drafted the manuscript, and AM critically revised the manuscript for important intellectual content. AM and G facilitated all project-related tasks.

* Corresponding author at: Pediatric Surgery Division, Department of Surgery, Faculty of Medicine, Universitas Gadjah Mada/Dr. Sardjito Hospital, Jl. Kesehatan No. 1, Yogyakarta 55281, Indonesia. Tel./fax: +62 274 631036.

E-mail address: drgunadi@ugm.ac.id (Gunadi).

We diagnosed a patient with HSCR in our hospital based on the clinical manifestation, contrast enema, and/or histopathology findings. The hematoxylin and eosin staining and/or S100 immunohistochemistry were utilized for the histopathology diagnosis of HSCR [12–15].

One hundred non-syndromic HSCR patients (Soave = 71 vs. Duhamel = 29) had adequate data for analysis, consisting of 52 males and 19 females, and 23 males and 6 females for the Soave and Duhamel groups, respectively ($p = 0.62$), corresponding to a sex ratio of 3:1 (Table 1). The Soave and colo-Duhamel techniques were performed at our hospital based on previous studies [7,16]. The pull-through procedures were conducted by two experienced pediatric surgeons in our hospital. Each definitive surgery was chosen based upon the pediatric surgeon's preference. Any patients with a pull-through surgery performed external to our Hospital were excluded.

The Ethical Committee of Faculty of Medicine, Universitas Gadjah Mada/Dr. Sardjito Hospital gave approval for this study (KE/FK/787/EC/2015).

2.2. HAEC

Diagnosis of HAEC was determined using a HAEC scoring system [17]. HAEC scoring consists of 16 items that include: history, physical examination, radiologic examination, and laboratory findings. A HAEC score of 10 or greater indicates confirmed diagnosis of HAEC [17].

2.3. Statistical analysis

Data are presented as number and percentages for categorical variables. The chi-square test was used to evaluate the differences of HAEC frequency between groups. IBM SPSS Statistics version 16 (SPSS Chicago, IL, USA) was used for statistical analysis.

3. Results

We analyzed 100 HSCR patients: 75 males and 25 females. The Soave and Duhamel pull-through procedures were performed in 71 and 29 HSCR patients, respectively (Table 1).

There was significant difference in mean age at pull-through procedure (Soave: 29.9 ± 45.2 , Duhamel: 50.8 ± 47.5 months, $p = 0.04$), whereas the mean age of HSCR diagnosis and the pre-operative enterocolitis frequency did not differ significantly between groups (Soave: 25.4 ± 41.0 , Duhamel: 43.7 ± 48.1 months, $p = 0.06$; and Soave: 7% vs. Duhamel: 14%, $p = 0.44$, respectively). In addition, the follow-up time was equivalent in the two cohorts, of whom 17 ± 7.1 months and 25 ± 15.6 months for the Soave and Duhamel groups, respectively ($p = 0.24$) (Table 1).

The most common findings of the HAEC score found in the Duhamel group were history of enterocolitis (100%), followed by distended abdomen (87.5%), whereas for those in the Soave group findings showed: history of enterocolitis (100%), distended abdomen (100%), and shift

Table 1
Baseline characteristics of Indonesian Hirschsprung patients

Characteristic	Soave n (%)	Duhamel n (%)	P-value
Gender			
■ Male	52/71 (73)	23/29 (79)	0.62
■ Female	19/71 (27)	6/29 (21)	
Aganglionosis type			0.09
■ Short-segment	68/71 (96)	25/29 (86)	
■ Long-segment	3/71 (4)	4/29 (14)	
Age of HSCR diagnosis	25.4 ± 41.0 mo	43.7 ± 48.1 mo	0.06
Age of pull-through	29.9 ± 45.2 mo	50.8 ± 47.5 mo	0.04
Pre-operative HAEC	5/71 (7)	4/29 (14)	0.44
Length of follow-up	17 ± 7.1 mo	25 ± 15.6 mo	0.24

mo, months; HSCR, Hirschsprung diseases; HAEC, Hirschsprung-associated enterocolitis.

to left (100%), followed by lethargy (85.7%) and dilated loops of bowel (85.7%) (Table 2).

Our first analysis involved comparing the HAEC frequency after the Soave and Duhamel procedures (Table 3). The episodes of HAEC took place at 5 ± 5.3 months and 8 ± 5.6 months after the Soave and Duhamel procedures, respectively. For the Soave technique, the HAEC frequency following pull-through occurred in 7/71 (10%) HSCR patients, while for the Duhamel procedure, it was 8 (28%) of 29 HSCR patients. These frequency differences were statistically significant with p -value of 0.03 (Table 3). Furthermore, the risk of HAEC after Soave pull-through was increased in long-segment aganglionosis compared to short-segment HSCR (p -value = 0.015), with odds ratio (OR) of 24.4 (95% confidence interval (CI) = 1.9–318.1) but was not significantly associated with gender (p -value = 0.44) (Table 3).

To determine the impact of pre-operative enterocolitis on the development of HAEC following pull-through, we analyzed the observed number of patients with pre-operative and post-operative enterocolitis with respect to the Soave and Duhamel procedures. The results shown in Table 4 clearly demonstrate that there was a strong association between the diagnosis of pre-operative and post-operative enterocolitis in all groups (p -value = 0.041, 0.017, and 2.0×10^{-4} for Soave, Duhamel, and total group, respectively) with OR of 8.1 (95% CI = 1.1–60.6), 43 (95% CI = 1.9–948.3), and 18.2 (3.9–85.6) for Soave, Duhamel and total group, respectively (Table 4).

4. Discussion

We present new data on Indonesian HSCR patients that reveal a similar frequency of short-segment aganglionosis and male patients as

Table 2
HAEC scoring system findings in Indonesian Hirschsprung patients following Soave and Duhamel procedures.

HAEC Score	Soave n (%)	Duhamel n (%)
History		
Diarrhea with explosive stool	2/7 (28.6)	3/8 (37.5)
Diarrhea with foul-smelling stool	4/7 (57.1)	6/8 (75)
Diarrhea with bloody stool	1/7 (14.3)	3/8 (37.5)
History of enterocolitis	7/7 (100)	8/8 (100)
Physical examination		
Explosive discharge of gas and stool on rectal examination	5/7 (71.4)	5/8 (62.5)
Distended abdomen	7/7 (100)	7/8 (87.5)
Decreased peripheral perfusion	3/7 (42.9)	1/8 (12.5)
Lethargy	6/7 (85.7)	5/8 (62.5)
Fever	5/7 (71.4)	5/8 (62.5)
Radiologic examination		
Multiple air fluid levels	2/7 (28.6)	2/8 (25)
Dilated loops of bowel	6/7 (85.7)	5/8 (62.5)
Sawtooth appearance with irregular mucosal lining	1/7 (14.3)	1/8 (12.5)
Cutoff sign in rectosigmoid with absence of distal air	5/7 (71.4)	5/8 (62.5)
Pneumatosis	1/7 (14.3)	2/8 (25)
Laboratory finding		
Leukocytosis	6/7 (85.7)	6/8 (75)
Shift to left	7/7 (100)	6/8 (75)

Download English Version:

<https://daneshyari.com/en/article/8810170>

Download Persian Version:

<https://daneshyari.com/article/8810170>

[Daneshyari.com](https://daneshyari.com)