Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: https://saspublishers.com

OPEN ACCESS

Pediatric Surgery

Adaptation to the Resource Available in Construction of Stoma in Pediatric Stoma Care in Bangladesh: A Descriptive Analytical Study

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DOI: 10.36347/sjams.2022.v10i12.007 | **Received:** 06.09.2022 | **Accepted:** 17.10.2022 | **Published:** 03.12.2022

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Abstract **Original Research Article**

Background: Stoma construction is a routine operation in the field of pediatric surgery. Commercially accessible resources, such as ostomy bags (either disposable or with extended lifespans), are often employed to care for these stomas. These may be rather pricey, especially in places like Bangladesh, and it might be difficult to get ones in the right size. ***Objective:*** In this study our main objective is to evaluate the efficacy of resource available in construction of stoma in Pediatric stoma care in Bangladesh. ***Method:*** From January 2014 through December 2015, a total of 60 patients were included in a prospective research done by the pediatric surgery department at Dhaka Medical College and Hospital. The research group consisted of patients less than 12 years old who had temporary loop colostomy or ileostomy in the pediatric surgical units at Dhaka Medical College & Hospital throughout the study period. Zinc oxide paste was first administered to the Peristomal skin after stoma formation. The stoma was covered with a betel leaf, which had a glossy, smooth outside surface and a rough inner surface. The size of the hole in the betel leaf was adjusted to accommodate the stoma. The stoma is protected by an additional leaf that is still fully intact. When nature calls, one must remove the undamaged leaf above it and wipe away the feces before moving on. The cleaned leaves were put to further use. Ostomy bags (like those made by Convatec) and adhesive paste (Stomahesive) are used to seal the bag to the Peristomal skin. ***Results:*** During the study, both the stoma bag and betel leaf groups had a wide range of ages, from one day to 4,320 days. In addition, both group anorectal malformations found as common indication 70% vs 73.33% (stoma bag vs betel leaf) followed by in stoma bag group 23.33% had Hirschsprung's disease and 6.67% had Colonic atresia. Where as in betel leaf group 20% had Hirschsprung's disease and 6.67% had Colonic atresia? In stoma bag group majority had Ileostomy followed by 30% had Transverse colostomy, 23.33% had sigmoid colostomy. Where as in betel leaf group 43.33% had sigmoid colostomy. Moreover, in ostomy bag group 28.30% had healthy skin, followed by 21.70% had mild excoriation, 5% had moderate excoriation. Where as in betel leaf users 31.70% had healthy skin and 13.30% had mild excoriation and none of them had moderate excoriation. However, in stoma bag group 73.33% had allergic reaction, 70% had bleeding, 76.67% had mucosal ulceration and 80% had rashes and itching. Where in betel leaf group no other complication didn't noticed. ***Conclusion:*** One of the main obstacles to successful pediatric surgery in Bangladesh is the lack of enough resources. In this context, betel leaves are inexpensive, readily accessible, safe for handling, and hypoallergenic.

Keywords: Pediatric stoma, stoma bag, betel leaf.

INTRODUCTION

Stoma construction is a routine surgery for many medical issues, both congenital and acquired [1]. Stoma care is one of the cornerstones of stoma management. For the best stoma care, a device that is both simple to use and pleasant to wear is required to prevent further damage to the skin surrounding the incision. Several stoma care devices are available for purchase [2, 3].

The problem is that they are costly and not always readily accessible in a developing nation like Bangladesh. Several businesses made unsuccessful efforts to import ostomy bags to Bangladesh throughout the 1990s, when the field of pediatric surgical medicine was only being started there. However, the business was not economically successful, and there were regular disruptions in the availability of ostomy bags on the market. It is estimated that there are roughly 150,000,000 people living in Bangladesh, with a

rural/urban population ratio of 76:24 and a per capita income of about US$450 [4].

As a cultural and educational minority, Bangladeshis are not used to publicly carrying a bag of human waste. With these considerations in mind, we came up with an alternate strategy fit for our people, which involve the use of a relatively inexpensive and readily accessible plant, betel leaf (Piper betle).

OBJECTIVE

The main objective of this study was to evaluate the efficacy of resource available in construction of stoma in Pediatric stoma care in Bangladesh. In addition, comparison of skin excoriation between ostomy bag and betel leaf using in pediatric stoma care.

MATERIALS & METHODS

In this study, randomized controlled clinical trial was executed. Participants were randomly allocated in two groups Stoma bag group (Group 1) and, Betel leaf group (Group 2). Randomization was done using sealed envelopes, prepared before starting the study. Envelop contained name of a single group.

This study was conducted at the department of pediatric surgery, Dhaka Medical College and Hospital, over a period of 24 months January, 2014 to December; 2015.This hospital is a tertiary level government hospital with a huge number of patients coming all parts of the country.

Patients within 12 years having temporary loop colostomy or ileostomy in the pediatric surgery units of Dhaka Medical College & Hospital within the study period were considered as the study population.

To determine the sample size, this formula $n=t^2$ X p (1-p)/m^2 was followed.

Clinical judgment was used to select study population sample units until the desired sample size was reached. When a patient was admitted and needed a temporary ileostomy or colostomy, their guardians were informed and informed consent was obtained.

Sixty envelops with study group names were used (stoma bag group or betel leaf group). Thirty envelopes held stoma bags. Betel leaf group had 30. Each patient's guardian was asked to give the investigator an envelope. Each participant was placed in a study group based on the envelope.

Due to the short study period and age of the participants, 60 patients were used-30 in each group.

The principal investigator collected data and investigated at Dhaka Medical College and Hospital. Data was collected on a sheet. In each case, patient information was collected in a prescribed questionnaire (appendix-I) after getting written consent from parents or legal guardians. After admission, each patient was examined and pertinent information noted.

General questionnaire, clinical examination, operative findings and follow up these particular 4 types of tools were used to collect data.

Zinc oxide paste was applied to the peristomal skin after stoma construction. A betel leaf with a smooth, shiny outside and a rough inside was placed over the stoma with a hole in the center. The hole fit the stoma snugly. Another leaf covers the stoma. When a bowel movement occurs, the intact leaf and feces are removed. Clean leaves were reused. Children had follow-up visits at the pediatric surgery ward during the study period.

Statistical analysis was performed using SPSS version 21 and results were tabulated. Clinical features were analyzed descriptively, and results were presented as mean standard deviation, X2-test for proportional differences, and unpaired Student's t-test for mean differences. All two-sided values were significant if p 0.05.

RESULTS

Table-1 revels demographic status of patients where both the stoma bag and betel leaf groups had a wide range of ages, from one day to 4,320 days. The average ages of those using stoma bags and those using betel leaves were, respectively, 1339.731470.19 and 721.701227.64 days. Since the p value was less than 0.033, there was a statistically significant age difference between the groups. In addition, Over half of the patients were male (41 out of 60) whereas just 19 were female. Patients in the betel leaf group were mostly male (76%). There was a statistically significant disparity in the sex composition of the study groups (P value -0.017). Sixty percent of the stoma bag population is male and forty percent is female. The following table is given below in detail:

Table-1: Demographic status of patients

Age	**Stoma bag group (n=30)**	**Betel leaf group (n=30)**	P value
Days	(1-4320)	(1-3960)	0.033
Mean ± SD	(1339.73 ±1470.19)	(721.70 ±1227.64)	
Gender	**Stoma Bag group, n (%)**	**Betel leaf group, n (%)**	**P value**
Male	18(60%)	23 (76.6%)	0.017
Female	12 (40%)	7 (23.3%)	

Table-2 shows indication of stoma formation of patients where in both group anorectal malformation found as common indication 70% vs 73.33%. Followed by in stoma bag group 23.33% had Hirschsprung's disease and 6.67% had Colonic atresia. Where as in betel leaf group 20% had Hirschsprung's disease and 6.67% had Colonic atresia? The following table is given below in detail.

Table-2: Indication of stoma formation of patients

Indication of stomas formation	Stoma Bag group, n (%)	Betel leaf group, n (%)
Anorectal Malformations	21 (70%)	22 (73.33%)
Hirschsprung's disease	7 (23.33%)	6 (20%)
Colonic atresia	3 (6.67%)	2 (6.67%)

Table-3 explains use of betel leaf and ostomy bag in different types of stomas where in stoma bag group majority had Ileostomy followed by 30% had Transverse colostomy, 23.33% had sigmoid colostomy. Where as in betel leaf group 43.33% had sigmoid colostomy. The following table is given below in detail:

Table-3: Use of betel leaf and ostomy bag in different types of stomas

Types of stomas	Stoma Bag group, n (%)	Betel leaf group, n(%)
Sigmoid colostomy	7 (23.33%)	13 (43.33%)
Transverse colostomy	9 (30%)	9 (30%)
Ileostomy	13 (43.33%)	6 (20%)
Jejunostomy	1 (3.34%)	2 (6.67%)

Fig.1: Stoma care with betel leaf with distal loop irrigation

Fig: 2 infants with stoma bag with wafer

In figure-3 shows Outcomes of resources based on skin excoriation where in ostomy bag group 28.30% had healthy skin, followed by 21.70% had mild excoriation, 5% had moderate excoriation. Where as in betel leaf users 31.70% had healthy skin and 13.30% had mild excoriation and none of them had moderate excoriation. The following figure is given below in detail:

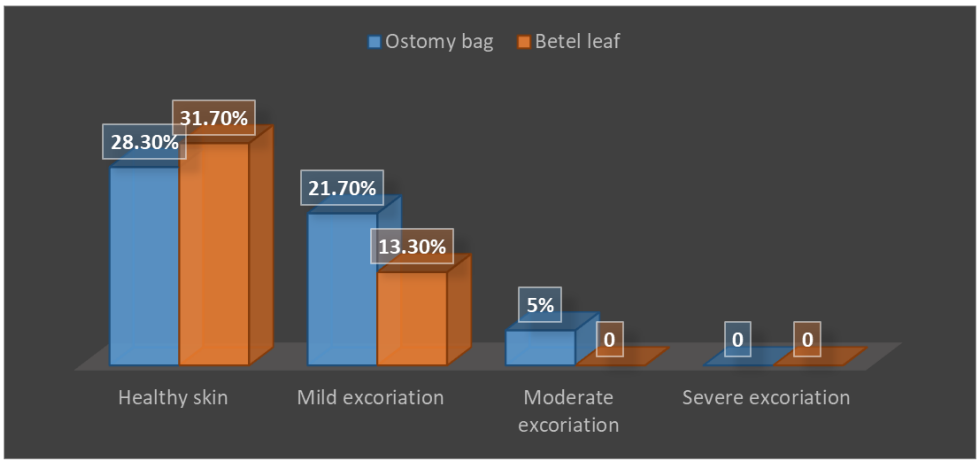

Figure-3: Outcomes of resources based on skin excoriation

Table-4 reveals outcomes of resources based on complications where in stoma bag group 73.33% had allergic reaction, 70% had bleeding, 76.67% had mucosal ulceration, 80% had rashes and itching. Where in betel leaf group no other complication didn't noticed in beef leaf users. The following table is given below in detail:

Table-4: Outcomes of resources based on complications

Outcomes of resources	Stoma Bag group, n (%)	Betel leaf group, n(%)
allergic reactions	22 (73.33%)	0
Bleeding	21 (70%)	0
Mucosal ulceration	23 (76.67%)	0
Rashes and itching	24 (80%)	0

- Multiple responses were observed

DISCUSSION

Digestive, stimulating, expectorant, carminative, and antibacterial properties of P. betle have been recognized for centuries in south and south East Asia [5]. Betel leaf, or Pan as it is often referred to, is a beautiful spice that grows quickly, persists year after year, is dark green, glossy on one side and rough on the other, and has a heart shape and creeping stem branches. They are gathered in various regions of Bangladesh, India, Myanmar, and Indonesia. After meals, it is customary for rural Bangladeshis to chew these leaves with betel nuts. These leaves are a staple export for Bangladesh to Pakistan and the Middle East [6, 7].

In this region, betel leaf has been used for various health purposes for at least two millennia. Headaches may be quickly alleviated by placing a betel leaf on the forehead. Its purpose is to stop the discharge of noxious odorous fluids and accompanying leakage.

A typical technique in rural areas is to apply the juice of leaves on wounds. Only for stoma care is it used in our department. Antiseptic qualities may be found in betel leaves due to the presence of chavical, a phenol [8].

Due to a lack of resources, we were unable to isolate the leaf's numerous active compounds. Patients with stomas may still have skin excoriation, leaky pouch, difficulties with malodor, allergy to adhesives, and difficulty changing, despite the fact that the variety and complexity of commercially available stoma care products and equipment has expanded significantly in recent years. All of these issues have the potential to lead to major emotional and physical hardship for the patients involved.

In our study in stoma bag group 73.33% had allergic reaction, 70% had bleeding, 76.67% had mucosal ulceration, 80% had rashes and itching. Where in betel leaf group no other complication didn't noticed in beef leaf users. Which was quite similar to Banu T *et al.*, 2007 where it was found that among the 128 patients who used ostomy bags, 52 (40.6%) had skin excoriation with small ulcerations and bleedings, and 24 (18.75%) developed some allergic reactions to adhesives with rashes and itching. Of the 495 children using betel leaf stomas, only 13 (2.6%) experienced skin excoriation, and there were no allergic reactions [9].

In addition study of Anyanwu *et al.*, 2013 reported in their study that, Anorectal malformations were the most common indication for a colostomy (32, 72.73%), followed by Hirschsprung's disease (11, 25%). Forty-two (42) patients had a divided sigmoid colostomy (95.45%); two patients had a right loop

transverse colostomy (4.55%) [10]. Which was quite similar to our study where in both anorectal malformations found as a common indication 70% vs 73.33% (stoma vs betel leaf). Though in our study different types of stomas were noticed where in stoma bag group majority had Ileostomy followed by 30% had Transverse colostomy, 23.33% had sigmoid colostomy. Where as in betel leaf group 43.33% had sigmoid colostomy.

CONCLUSION

Inadequacy of facilities and support for pediatric colorectal surgery in Bangladesh is a major challenge militating against a good outcome. In this case betel leaves are cheap, easy to handle, nonirritant, and non-allergic.

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