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Research Article

Effectiveness of dry pressure dressing versus wet dressing on wound healing among children undergone abdominal surgery at pediatric surgical ward, Govt Rajaji Hospital, Madurai.

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Abstract:

Background: Children are a valuable asset of society, and their health and well-being are essential for a healthy future generation. **Aim:** To evaluate the effectiveness of dry pressure dressing versus wet dressing on wound healing among children undergone abdominal surgery. **Methods:** A quantitative evaluative methodology with a true experimental pretest–posttest design was employed. Sixty children who fulfilled the inclusion criteria were chosen using simple random sampling and subsequently allocated to Intervention Group I (dry pressure dressing, n=30) and Intervention Group II (wet dressing, n=30). Data were gathered via a standardized instrument that included socio-demographic information, clinical characteristics, and the Southampton Wound Grading System. **Results:** The paired t-test showed a very highly significant improvement in Group I ($t=8.23$, $p<0.001$) and a highly significant improvement in Group II ($t=4.71$, $p=0.001$), indicating that dry pressure dressing was more effective than wet dressing in promoting wound healing. **Conclusion:** The study revealed that both dry pressure dressings and wet dressings were beneficial in facilitating wound healing in children undergone abdominal surgery.

Key words: Children, wound healing, dry pressure.

INTRODUCTION

Children are a valuable asset of society, and their health and well-being are essential for a healthy future generation. However, hospitalization and surgical procedures during childhood can negatively affect physical and psychological development. Therefore, effective postoperative care is crucial for ensuring optimal recovery and reducing complications. Many congenital and acquired gastrointestinal disorders, such as appendicitis, intussusception, Hirschsprung disease, volvulus, and incarcerated hernia, require abdominal surgery in children. Successful surgical outcomes depend not only on the procedure itself but also on appropriate postoperative wound management. Maintaining skin integrity is important because the skin acts as the body's primary defense against infection.

Wound dressing plays a vital role in promoting healing, preventing infection, and protecting the surgical site. Over the years, wound care practices have evolved from traditional dry dressings to advanced moisture-retentive techniques. Research has demonstrated that a moist wound environment can accelerate tissue repair, enhance cell proliferation, and improve healing outcomes. Various dressing materials, including dry dressings, moisture-retentive dressings, bioactive dressings, and skin substitutes, are currently used in clinical practice. Among the commonly used antiseptic agents, povidone-iodine remains widely accepted because of its broad antimicrobial activity, ability to reduce infection risk, and favorable safety profile. Proper wound care and dressing selection are particularly important in pediatric surgical settings, where delayed healing and wound infections

can significantly affect recovery and quality of life..

Despite advances in wound management, surgical site infections continue to be a major postoperative complication. Therefore, identifying effective dressing methods is essential to improve wound healing outcomes among children undergone abdominal surgery. This study focuses on evaluating the effectiveness of dry pressure dressing compared with wet dressing in promoting postoperative wound healing among pediatric abdominal surgery patients.

AIM

The aimed to evaluate the effectiveness of dry pressure dressing versus wet dressing on wound healing among children undergone abdominal surgery.

METHODOLOGY

A quantitative evaluative methodology with a true experimental pretest–posttest design was employed. The research was performed in the Pediatric Surgical Ward of Government Rajaji Hospital, Madurai. Sixty children who fulfilled the inclusion criteria were chosen using simple random sampling and subsequently allocated to Intervention Group I (dry pressure dressing, n=30) and Intervention Group II (wet dressing, n=30). Data were gathered via a standardized instrument that included socio-demographic information, clinical characteristics, and the Southampton Wound Grading System. Content validity was confirmed via expert evaluation, and the instrument exhibited strong reliability ($r = 0.83$). Ethical approval and informed permission were secured before data collection

commenced A pretest assessment was conducted on the first postoperative day, succeeded by the use of the appropriate dressing techniques for five consecutive days starting from the second postoperative day. The assessment of wound healing was conducted on the seventh postoperative day utilizing the Southampton Wound Grading System. The data were examined utilizing descriptive statistics (frequency and percentage) and inferential statistics, comprising the paired t-test and chi-square test.

RESULT

The majority of children in both Intervention Group I and Group II were above 6 years of age, male, Hindu, residing in rural areas, first-born children, and belonged to nuclear families. Most fathers had secondary education and were unemployed, while most mothers were homemakers. The majority of families had a monthly income between Rs.10,001–15,000 and followed a mixed dietary pattern. (Table 1)

Most children in both groups were school-aged and had either I or II degree malnutrition. The majority had some dehydration and normal laboratory values. Almost all had no previous history of surgery, medication use, or COVID-19 infection. Open appendectomy was the most common surgery, and emergency surgeries predominated in both groups. All children passed urine and flatulence within 24 hours postoperatively. (Table 2)

Both dry pressure dressing and wet dressing significantly improved wound healing among children undergone abdominal surgery. However, the mean score reduction was greater in the dry pressure dressing group (0.70) than in the wet dressing group (0.44). The paired t-test showed a very highly significant improvement in Group I ($t=8.23$, $p<0.001$) and a highly significant improvement in Group II ($t=4.71$, $p=0.001$), indicating that dry pressure dressing was more effective than wet dressing in promoting wound healing. (Table 3)

DISCUSSION

This study assessed the efficacy of dry pressure dressing compared to wet dressing on wound healing in children having abdominal surgery. The results indicated that the socio-demographic and clinical features of participants in both intervention groups were comparable, demonstrating baseline homogeneity across the groups.

Concerning wound healing, the pre-test mean score was equivalent in both groups (Mean = 1.00), indicating that participants possessed comparable wound conditions prior to the intervention. Subsequent to the intervention, the post-test mean wound healing score diminished to 0.30 ± 0.46 in the dry pressure dressing cohort and 0.56 ± 0.50 in the wet dressing cohort. The mean score reduction was more significant in the dry pressure dressing group (0.70) than in the wet dressing group (0.44).

Statistical analysis indicated a highly significant enhancement in wound healing for children treated with dry pressure dressing ($t = 8.23$, $p < 0.001$) and a considerable improvement for those treated with wet dressing ($t = 4.71$, $p = 0.001$).

The enhanced wound healing noted in the dry pressure dressing cohort may be ascribed to its capacity to diminish wound exudate, alleviate edema, lower infection risk, and facilitate tissue repair. The study findings endorse the utilization of dry pressure dressing as an efficacious postoperative wound management approach for pediatric patients after abdominal surgery.

CONCLUSION

The study revealed that both dry pressure dressings and wet dressings were beneficial in facilitating wound healing in children undergone abdominal surgery. Nonetheless, dry pressure dressing exhibited much superior efficacy, as indicated by a bigger mean score reduction and a very significant enhancement in wound healing outcomes. Consequently, dry pressure dressing may be regarded as a superior postoperative wound care technique for promoting wound healing and mitigating complications in pediatric surgery patients.

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Table 1. Distribution of Socio-Demographic Variables among Children Undergone Abdominal Surgery in Intervention Group I and Intervention Group II (N = 60)

Variables	Categories	Intervention Group I f (%)	Intervention Group II f (%)
Age of the Child	<1 year	3 (10.0)	5 (16.7)
	1–3 years	2 (6.7)	4 (13.3)
	3–6 years	7 (23.3)	4 (13.3)
	>6 years	18 (60.0)	17 (56.7)
Gender	Male	17 (56.7)	19 (63.3)
	Female	13 (43.3)	11 (36.7)
Religion	Hindu	18 (60.0)	15 (50.0)
	Christian	4 (13.3)	7 (23.3)
	Muslim	8 (26.7)	8 (26.7)
Place of Domicile	Urban	6 (20.0)	5 (16.7)
	Sub-urban	8 (26.7)	7 (23.3)
	Rural	16 (53.3)	18 (60.0)
Order of Birth	First	19 (63.3)	16 (53.3)
	Second	9 (30.0)	11 (36.7)
	Third and above	2 (6.7)	3 (10.0)
Number of Siblings	Nil	19 (63.3)	16 (53.3)
	One	9 (30.0)	11 (36.7)
	Two and more	2 (6.7)	3 (10.0)
Type of Family	Nuclear	20 (66.7)	22 (73.3)
	Joint	7 (23.3)	6 (20.0)
	Extended	3 (10.0)	2 (6.7)
Educational Status of Father	Primary education	7 (23.3)	4 (13.3)
	Secondary education	14 (46.7)	16 (53.3)
	Higher secondary	3 (10.0)	3 (10.0)
	Diploma and above	6 (20.0)	7 (23.3)
Educational Status of Mother	Primary education	11 (36.7)	8 (26.7)
	Secondary education	6 (20.0)	11 (36.7)
	Higher secondary	13 (43.3)	11 (36.7)
Occupation of Father	Unemployed	13 (43.3)	17 (56.7)
	Private employee	12 (40.0)	4 (13.3)
	Daily wages	5 (16.7)	9 (30.0)
Occupation of Mother	Homemaker	20 (66.7)	19 (63.3)
	Daily wages	6 (20.0)	4 (13.3)
	Private employee	4 (13.3)	7 (23.3)
Monthly Income	Rs. 5,001–10,000	14 (46.7)	12 (40.0)
	Rs. 10,001–15,000	16 (53.3)	18 (60.0)
Dietary Habits	Vegetarian	7 (23.3)	5 (16.7)
	Mixed diet	21 (70.0)	23 (76.7)
	Others	2 (6.7)	2 (6.7)

Table 2. Distribution of Clinical Variables among Children Undergone Abdominal Surgery in Intervention Group I and Intervention Group II (N = 60)

Clinical Variables	Categories	Intervention Group I f (%)	Intervention Group II f (%)
Developmental Age	Infant	3 (10.0)	5 (16.7)
	Toddler	2 (6.7)	4 (13.3)
	Preschooler	7 (23.3)	4 (13.3)
	Schooler	18 (60.0)	17 (56.7)
Nutritional Status	Normal nutritional status	8 (26.7)	7 (23.3)
	I Degree malnutrition	14 (46.7)	11 (36.7)
	II Degree malnutrition	8 (26.7)	12 (40.0)
	III Degree malnutrition	0 (0.0)	0 (0.0)
Hydration Status	No dehydration	12 (40.0)	10 (33.3)
	Some dehydration	18 (60.0)	20 (66.7)
	Severe dehydration	0 (0.0)	0 (0.0)
Laboratory Values	Normal	25 (83.3)	23 (76.7)
	Anaemia	5 (16.7)	7 (23.3)
Past History of Medication	None	30 (100.0)	30 (100.0)
	Steroids	0 (0.0)	0 (0.0)
	Chemotherapeutic drugs	0 (0.0)	0 (0.0)
	Systemic medications	0 (0.0)	0 (0.0)
	Others	0 (0.0)	0 (0.0)
Previous History of Surgeries	No previous surgery	29 (96.7)	30 (100.0)
	Once	1 (3.3)	0 (0.0)
	Twice	0 (0.0)	0 (0.0)
History of COVID-19	Not affected	30 (100.0)	30 (100.0)
	Affected before 1 year	0 (0.0)	0 (0.0)
	Affected before 6 months	0 (0.0)	0 (0.0)
	Affected before 3 months	0 (0.0)	0 (0.0)
Name of Surgery	Open Appendicectomy	16 (53.3)	17 (56.7)
	Ladd's Procedure	3 (10.0)	2 (6.7)
	Duhamel's Procedure	4 (13.3)	3 (10.0)
	Others	7 (23.3)	8 (26.7)
Type of Surgery	Emergency	25 (83.3)	21 (70.0)
	Elective	5 (16.7)	9 (30.0)
Presence of Nasogastric Drainage Tube	None	7 (23.3)	11 (36.7)
	Moli drain bag	13 (43.3)	10 (33.3)
	Bottle drain	10 (33.3)	9 (30.0)
	Others	0 (0.0)	0 (0.0)
Passing of Flatulence	< 24 hours	30 (100.0)	30 (100.0)
	> 24 hours	0 (0.0)	0 (0.0)
Passing of Urine	< 24 hours	30 (100.0)	30 (100.0)
	> 24 hours	0 (0.0)	0 (0.0)

Table 3. Comparison of Pre-test and Post-test Mean Wound Healing Scores among Children Undergone Abdominal Surgery in Intervention Group I and Intervention Group II (N = 60)

Intervention Group	Pre-test Mean $\pm$ SD	Post-test Mean $\pm$ SD	Mean Difference	Paired <i>t</i> Value	<i>p</i> Value
Group I (Dry Pressure Dressing) (n=30)	1.00 $\pm$ 0.00	0.30 $\pm$ 0.46	0.70	8.23	<0.001
Group II (Wet Dressing) (n=30)	1.00 $\pm$ 0.00	0.56 $\pm$ 0.50	0.44	4.71	0.001

$p < 0.05$ = Significant, $p < 0.01$ = Highly Significant, $p < 0.001$ = Very Highly Significant.

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