Effect of a Newly Developed Abdominal Webbing Strap for Pain Relief after Exploratory Laparotomy in Gynaecological Patients

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Abstract : **The effect of a newly developed abdominal webbing strap for pain relief after exploratory laparotomy in gynaecological patients was studied using a quasi-experimental method. The subjects consisted of 60 patients in gynaecological wards and were randomly allocated into 2 groups as a control group and an experimental group. The experimental group was given the webbing strap when they gained consciousness after operation until 72 hours later while the control group was not. A visual analogue scale was used to evaluate the pain level experienced by the patient. The percentage changes in pain level while resting, coughing and walking were evaluated in both groups at 24, 48, and 72 hours after operation. The data were then analysed using the Student t-test. The results of the study showed no statistical difference in the decrease of pain level for either group while they were resting ($P > 0.05$) at every time of evaluation. On the contrary, at every time of evaluation, the pain level of the experimental group showed a greater decrease than the control group when coughing or walking which was statistically significant ($P < 0.001$). The quantity of analgesic usage was also not statistically different for either group ($P > 0.05$). As a result of this, we suggest our new developed webbing strap should be used routinely in gynaecological patients after exploratory laparotomy.**

เรื่องย่อ : ผลของการใช้ผ้ารัดหน้าท้องที่ประดิษฐ์ขึ้นใหม่เพื่อลดความเจ็บปวดภายหลังการผ่าตัดทางหน้าท้องในผู้ป่วยนรีเวช

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ทำการวิจัยกึ่งทดลองเพื่อศึกษาผลของการใช้ผ้ารัดหน้าท้องที่ประดิษฐ์ขึ้นใหม่เพื่อลดความเจ็บปวดภายหลังการผ่าตัดทางหน้าท้องในผู้ป่วยนรีเวชที่หอผู้ป่วยนรีเวช โรงพยาบาลศิริราช จำนวน 60 ราย โดยแบ่งผู้ป่วยออกเป็น 2 กลุ่มเท่ากันด้วยวิธีสุ่ม กลุ่มควบคุมคือกลุ่มที่ไม่ได้รับการใช้ผ้ารัดหน้าท้องจำนวน 30 ราย และกลุ่มทดลองคือกลุ่มที่ได้รับการใช้ผ้ารัดหน้าท้องจำนวน 30 ราย โดยทำการรัดหน้าท้องตั้งแต่รู้สึกตัวดีภายหลังการผ่าตัด จนถึง 72 ชั่วโมงหลังการผ่าตัด ใช้ visual analog scale ในการประเมินความเจ็บปวด โดยประเมินความเปลี่ยนแปลงของระดับความเจ็บปวดเป็นร้อยละในทั้ง 2 กลุ่ม ขณะนอนพัก ไอ และเดิน เมื่อ 24, 48 และ 72 ชั่วโมงภายหลังการผ่าตัด จากนั้นวิเคราะห์เปรียบเทียบความแตกต่างของค่าร้อยละของคะแนนความเจ็บปวดโดยใช้ Student t-test

ผลการศึกษาพบว่าระดับความเจ็บปวดขณะนอนพักของทั้ง 2 กลุ่มไม่มีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติในทุกช่วงเวลา ในทางตรงกันข้ามพบว่าระดับความเจ็บปวดของกลุ่มทดลองลดลงมากกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติเมื่อประเมินในขณะไอและเดิน ในทุกช่วงเวลาที่ประเมิน และพบว่าปริมาณยาแก้ปวดที่ใช้ในผู้ป่วยทั้ง 2 กลุ่มไม่แตกต่างกันอย่างมีนัยสำคัญทางสถิติ

จากการศึกษาครั้งนี้ คณะผู้วิจัยแนะนำว่าควรมีการนำผ้ารัดหน้าท้องที่ประดิษฐ์ขึ้นใหม่มาใช้เป็นประจำในผู้ป่วยนรีเวชภายหลังการผ่าตัดทางหน้าท้อง

INTRODUCTION

Generally, pain relief for gynaecological patients after abdominal surgery is achieved by giving them analgesics. Even though analgesics are effective in reducing pain, it is not considered the best method due to their side effects. In fact, pain is strongly influenced by a psychological effect that results in different responses to pain by individual patients[1]. Thus, analgesics may not be quite effective in some cases. In order to ease the pain more effectively, other methods should be used together with a care plan.

From past experience in training patients to mobilise and perform breathing exercises, pillows or a hand support may be used to ease the pain caused by coughing to remove mucus. In addition, a multi-tailed webbing strap was used for some periods of time. However, no research on this type of the webbing strap has been conducted. The multi-tailed webbing strap was no longer used because it was inconvenient, fitted poorly and tended to slip off the paitent's body.[2] Recently, some private companies have manufactured elastic webbing straps to support surgical wounds that are more convenient and fit well. However, the strap is expensive and the low income patients may not be able to afford it especially in the present economic state. Moreover, an elastic webbing strap is not suitable for a hot and humid climate such as in Thailand. It causes discomfort due to a high rate of perspiration. Therefore, it was of interest to our research group to create a new type of webbing strap for these patients. The new webbing strap was made from Tetoron Cotton cloth (T/C cloth). Having been woven from natural and synthetic fibers, the T/C cloth demonstrates excellent properties such as being absorbent, easy to wash, does not lose shape easily and non-deformity.[3] It is also economical because it can be used for many times at a low cost. Furthermore, it can be adjusted to fit the patient and their result is a great reduction in pain since a fitted strap helps decrease stimulation of minor nerve fibers when post-surgery patients are moving their bodies. Since the surgical wound is very sensitive to stimulation, the patients suffer excruciating pain even with a small degree of stimulation[4]. Hence, reducing the stimulation at minor nerve fibers diminishes the pain substantially.

The objective of this project is to study the effectiveness of the newly developed webbing strap in relieving pain in gynaecological patients after exploratory laparotomy.

MATERIALS AND METHODS

Materials

Webbing straps designed by the research team were used for the study. The strap was made from two pieces of trapezoidal T/C cloth. The front piece is shorter than the rear one. Both pieces have the same height of 11 inches but difference in length according to patient's body size. For each piece, both sides of it were sutured with 4 horizontally attached Velcopack of 5 inches long. A ring, made from Velcopack, to which a sanitary pad was attached, was prepared in the lower middle portion of each T/C cloth and was located at 4 inches above the brim of each T/C cloth.

The webbing straps are demonstrated in Figure 1. Figures 2 and 3 show the front view and back view of the model while wearing webbing straps respectively.

Methods

60 patients admitted to gynecological wards of Siriraj Hospital during the period from June 1999 to October 2000 were enrolled in this study. Subjects eligible for enrollment were patients diagnosed as having myoma uteri, ovarian tumor or ovarian cyst without any other serious diseases. The exclusion criteria consisted of ovarian cancer patients diagnosed after operation, patients receiving a spinal block, patients with planned analgesics after operation or patients who were given analgesics with in 4 hours of evaluation. They were randomly allocated into 2 groups as a control group and an experimental group.

Before the operation, the patients in each group was interviewed and personal and relevant information was recorded. The research were explained to them.

- In the control group : The first evaluation of the pain level was performed using visual analogue scale when the patient regained conciousness after the operation. The second, third and fourth evaluations were performed at 24, 48 and 72 hours respectively. Also, the pain levels experienced by the patient when inactive and when active, including coughing and walking were evaluated on the second, third and fourth observations.

- In the experimental group : The first evaluation of the pain level was performed on the first day when the patients regained consciousness after the operation using the same method as the control group. Then, the research assistant helped the patient put on the webbing strap. The second, third and fourth evaluations were then performed at 24, 48 and 72 hours. Also, the pain level experienced by the patient when inactive and active, including coughing and walking were evaluated on the second, third and fourth observations.

The patients in both groups received the same regimen and comparable quantities of analgesics during the operation . After the operation they would be given the analgesics as requests. In the first 24 hours after operation, morphine injection would be used. After this period , oral acetaminophen would be used instead of morphine to reduce the side effects of morphine.

Statistics

Data analyses were performed by SPSS for Windows using Student t-test to compare the percentage changes of pain on visual analogque scale (VAS). Statistical significance was taken at $p \leq 0.05$.

RESULTS

The characteristics of the patients studied are shown in Table 1. There were no significant differences ($P > 0.05$) between the two groups regarding age, weight, marital status, educational level, occupation and income.

The details of diagnoses and operations in both groups are shown in Table 2. There are no statistically significant differences between the groups ($P > 0.05$).

The quantities of analgesics used were not statistically different between the groups ($P > 0.05$) as shown in Table 3.

The changes in postoperative pain at various stages using visual analog scale for both the control and experimental groups are shown in Table 4. The results of the study showed no statistical difference in the decrease of pain level in either group at rest ($P > 0.05$) for every evaluation. However, when

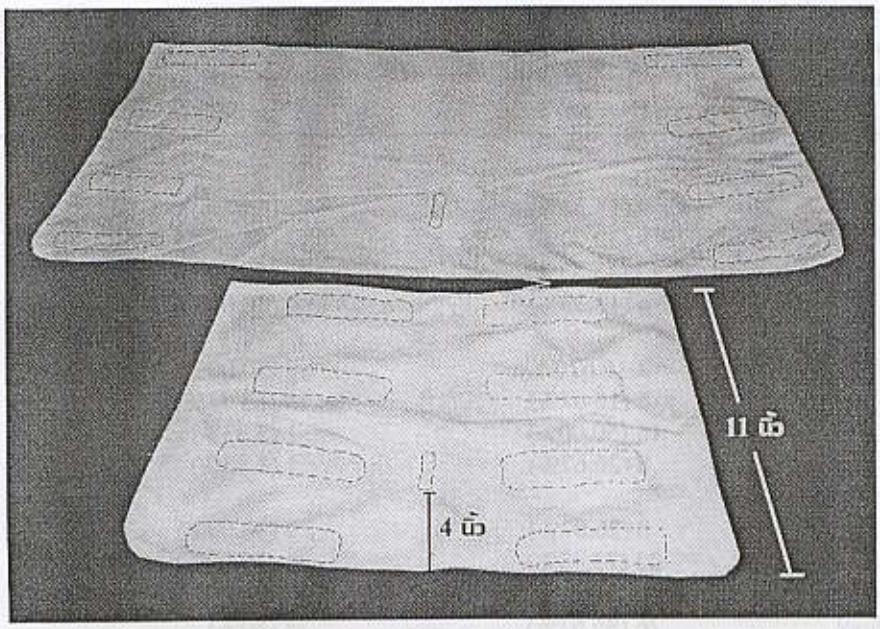


Figure 1. Webbing straps.

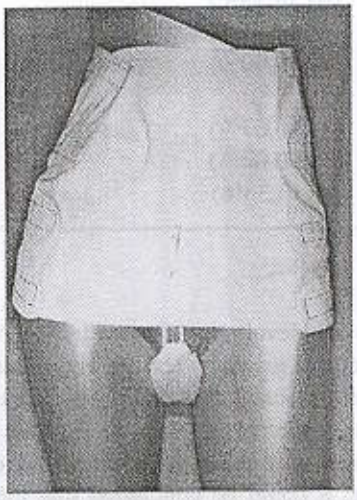


Figure 2. Front view.

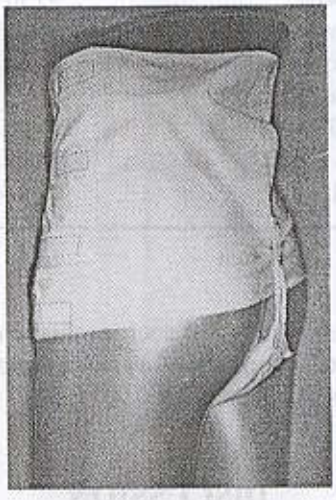


Figure 3. Back view.

Table 1. Characteristics of the patients studied.

Characteristics	Control group (N = 30)	Experimental group (N = 30)	P-value
Age (yr)			NS*
20 - 30	4 (13.33%)	2 (6.67%)	
31 - 40	9 (30.00%)	7 (23.33%)	
41 - 50	13 (43.33%)	12 (40.00%)	
> 50	4 (13.33%)	9 (30.00%)	
Weight (kg)			NS*
31 - 40	2 (6.67%)	9 (30.00%)	
41 - 50	5 (16.67%)	19 (63.33%)	
50 - 60	15 (50.00%)	1 (3.33%)	
> 60	8 (26.67%)	1 (3.33%)	
Marital Status			NS*
Single	8 (26.67%)	9 (30.00%)	
Married	22 (73.33%)	21 (70.00%)	
Educational level			NS*
Primary school	26 (86.67%)	24 (80%)	
Secondary school	2 (6.67%)	2 (6.67%)	
High school and higher	2 (6.67%)	4 (13.33%)	
Occupation			NS*
Housewife	9 (30.00%)	10 (33.33%)	
Government officials	1 (3.33%)	2 (6.66%)	
Private workers	20 (66.66%)	18 (60.00%)	
Income (Baht/month)			NS*
< 3,000	15 (50.00%)	11 (36.67%)	
3,001 - 6,000	14 (46.67%)	15 (50.00%)	
≥ 6,001	1 (3.33%)	4 (13.33%)	

NS* = not significant

coughing or walking at each evaluation time, the experimental group showed a greater decrease in pain than the control group ($P < 0.001$).

DISCUSSION

The postoperative pain score experienced by patients does not depend only on the nerve impulses generated by the organs but also by many factors such as the brain-control mechanism of pain sensation, the patient's experience, beliefs, definition of pain and their level of pain resistance[5].

All rest, at 24, 48 and 72 hours after operations, the pain levels experienced by the experimental and control groups were not significantly different. This is probably due to the absence of external stimulation, decreasing impulses from the small nerve fibres and time passes after the operation. Therefore, it could be concluded that the webbing strap did not help decrease pain while the patients were at rest.

The patients in the experimental group encountered less pain than the control group when coughing and walking. This might be explained by the fact that when the patients were coughing or walking, there was an increase of muscle contraction and

Table 2. Disagnoses and operations of the subjects.

Diganosis/operation	Control group (N = 30)	Experimental group (N = 30)	P-value
Diagnosis			NS*
Myoma uteri	21 (70%)	23 (76.66%)	
Benign ovarian tumor	9 (30%)	7 (23.33%)	
Operation			NS*
Hysterectomy	22 (73.33%)	28 (93.33%)	
Oophorectomy	8 (26.66%)	2 (6.67%)	
Abdominal surgical incision			NS*
Low midline	28 (93.33%)	26 (86.67%)	
Pfannenstiel	2 (6.67%)	4 (13.33%)	
Mean operation time (hours)	2.20 ± 0.97	2.20 ± 0.61	NS*

NS* = not significant

Table 3. Analgesic use.

Pain reliever	Control group (N = 30)	Experimental group (N = 30)	P-value
Morphine (mg)	18.33 ± 7.91	18.00 ± 8.70	NS*
500 mg of Acetaminophen (tab)	4.06 ± 2.36	4.14 ± 1.80	NS*

NS* = not significant

Table 4. Comparison of the changes in postoperative pain at various stages using visual analog scale.

	% Change in visual analog scale (mean ± S.D.)		
Stages	Control group	Experimental group	P-value
24 hours after operation			
Resting	13.25 ± 42.57	30.35 ± 26.99	0.068
Coughing	-43.58 ± 38.18	10.37 ± 27.32	< 0.001
Walking	-21.57 ± 44.23	14.21 ± 26.02	< 0.001
48 hours after operation			
Resting	33.91 ± 39.04	42.55 ± 27.32	0.325
Coughing	-21.57 ± 32.65	19.41 ± 26.21	< 0.001
Walking	-5.44 ± 35.11	29.80 ± 35.11	< 0.001
72 hours after operation			
Resting	45.92 ± 32.86	58.91 ± 24.21	0.086
Coughing	-10.93 ± 26.51	33.08 ± 26.51	< 0.001
Walking	16.33 ± 33.45	49.86 ± 23.07	< 0.001

signals from small nerve fibres which caused an increase in the perception of pain in the patients of the control group. Using the webbing strap in the patients of the experimental group demonstrated a direct reduction in pain stimulation near a surgical wound. This was evidenced by the fact that the t-test scores for pain perception in the patients in the experimental group decreased more than the control group. It could be concluded that the webbing strap helped decrease the pain while patients were coughing and walking. This result agreed well with a study in patients undergoing open heart surgery using a webbing strap as a chest support which found that the patients using a webbing strap suffered less pain than those without it[6].

The dosages of analgesics used by the patients in the control group and the experimental group were the same. This may be due to the fact that physicians usually order analgesics *p.r.n.* (as required). As a result of this practice, patients might feel uncomfortable to disturb a nurse by requesting pain relief even they needed it. This behavior might made nurses underestimate the patients' pain level[7]. Consequently, nurses might not give pain relief to patients until the time set in the schedule. Moreover, some patients perceived that the nature of an operation was so painful that they inevitably had to withstand the pain[8] and chose to lie down restfully in order to reduce the pain.

CONCLUSION

This study shows the effectiveness of the newly developed webbing strap in reducing pain in postoperative gynaecological patients. We suggest our new webbing strap to be used routinely in gynaecological patients after exploratory laparotomy.

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