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RESEARCH ARTICLE

Pain reducing Technique for rectus sheath closure in elective cesarean sections: randomized clinical trial

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Abstract

Objectives: The aim of this study is to compare the effects of alternative techniques for closingrectus sheath on maternal postoperative tension pain, early ambulation and breast feeding.

Materials and Methods: randomized controlled clinical trial conducted upon cases attendingBenha medical school, Obstetrics and Gynecology department, Egypt .Sample size determined byDaniel formula equals six hundred patients.Patients undergoing elective Caesarean sections weredivided in two groups of three hundred patients in each group. Group one (classic closure group) in which the sheath closed continuously. In group two (the new technique) the rectus sheathclosure began in the midline by separate sutures to the left angle of the sheath. The right side ofthe sheath edge closed by separate sutures beginning at the midline and continued to the right angle then returned to the midline of the sheath and tied separately. The two groups of patients were observed for the durationof surgery, post-operative pain (evaluated by visual analogue scale of pain), early ambulation andearly breast feeding.

Results: patients in group two (the new technique) had reported significant low postoperativepain on visual analogue scale of pain with P value equals 0.00001 in severe form of pain. Thezero score (no pain) was 10% in the new technique group versus 1.6% in the control groupwith P value equals 0.0001.

Conclusion: Closing the rectus sheath in elective cesarean sections in two halves by separatestitches reduces pain scores and allows early ambulation and breast feeding in elective cesareansections.

INTRODUCTION

Caesarean section is one of the most commonly performed abdominal operations on women in most countries of the world. Its rate has increased markedly in recent years, and is about 20–25% of all child-births in most developed countries (1, 2).

The main goal of any surgical intervention is to close the cut layers anatomically without significant blood loss and toreduce the postoperative pain that allow for early recovery and ambulation.

Regional anesthesia significantly reduces postoperative pain, but most of pregnant females in Egypt refuse regional anesthesia for the fear of postoperative back-pain and headache.

Most of cesarean sections in many centers in Egypt done under general anesthesia so significantpostoperative pain become a problem.

The present study was a step to reduce postoperative pain in cesarean sections done undergeneral anesthesia.

Because of the large number of women that undergo caesarean section, even small differences in post-operative morbidity rates due to different techniques could translate into improved health

for a substantial number of women and significant savings of cost and health services resources. (3, 4, 5).
Closing the rectus sheath in cesarean sections by the continuous approach causes significant postoperative pain and delayed ambulation.
No comments in literature regarding the best way for closing the rectus sheath in cesarean sections.

Materials and methods

Setting: Benha university hospital obstetrics and gynecology department.
Study design: randomized controlled clinical trial, randomization done by computer software DatInf Rand List version 1.2. The doctors doing the procedure received a closed envelope for the type of the sheath closure and the postoperative pain assessed by another resident.
Eligibility criteria:
Inclusion criteria
Only patients with a transverse incision during an elective were included in this study
Exclusion criteria
Patients with established or gestational diabetes, coagulation defects, hemodynamic instability, septicemia or chorioamnionitis were excluded. Patients on cytotoxic drugs or anticoagulants and those with hematological disorders or malignancy were also excluded from the study.
Ethical approval: the study approved by the ethical and scientific committee of Benha university hospital obstetrics and gynecology department and written informed consent was taken from all patients.

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Sample size: calculated by Daniel formula
Sample Size = n / [1 + (n/population)]
In which n = Z * Z [P (1-P)/(D*D)] Population Value = 800
Expected Frequency of the Factor under Study =95%
Worst Acceptable Frequency = 85%
P = Expected Frequency Value = 95%
D = (Expected Frequency - Worst Acceptable) = 95%- 85% = 10%
Z = 1.960 with a Confidence Level of 95%
Sample Size = n / [1 + (n/population)]
In which n = Z * Z [P (1-P)/(D*D)]
This study was conducted on six hundred patients undergoing primary caesarean section; these patients divided into two groups according to the rectus sheath closure:
Group 1(classic continuous closure)
In this group the rectus sheath closure began by one angle and continued by running continuous sutures to the other angle in the classic way .it is my habit to make the first suture in the rectus sheath inverted and bites taken 1cm apart by vicrly sutures No (two zero 00) .

The advantages of small diameter suture are:
1-non significant tension made upon the sheath and postoperative pain reduced to a minimum
2-the needle pass does not compromise significant arterial supply in the sheath so weakening of the sheath less than larger diameter sutures.
3-rolling of the sheath reduced to a minimum
In group two (the new sheath closure)
Central sheath suture taken by vicryl sutures no 00 this offered the following advantages:
1-Approximation of the sheath edges without crushing by instruments for traction
2-closing from the centre to one side offers reduction of postoperative pain scores
The suturing continued to the left edge of the rectus sheath and then returned from the angle to be tied at the central part again. The right edge of the rectus sheath sutured by inverted suture at first to bury the knot centrally continued at one cm interval till the right part of the rectus sheath then returned again by running way to be sutured at the midline again.(figure 1,2)

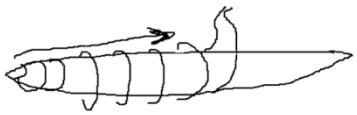

Figure 1 rectus sheath in the left side closed from the center then sutures returned from the edge to be tied at the center again.

Figure 2 the right side of the rectus sheath closed in a similar manner like right part.

Skin was stitched by subcuticular stitches with proline 2/0. Prophylactic antibiotics were given for 24 hours. All surgeries were performed by consultants or residents with at least two years of training.. All the surgeries were done under general anesthesia.

Postoperative evaluation:

All patients evaluated by residents in the first 2hours after delivery every 15 minutes

To allow a comparable assessment of pain, Visual Analogue Scale (VAS) was used with a 10 cm line labeled at '0' with 'no pain' and '10' with 'worst pain'. (figure 3) The line was marked at a point corresponding to the assessment of the pain. The distance of the mark from zero was measured .Data collected and evaluated by SPS (smith statistical packages).

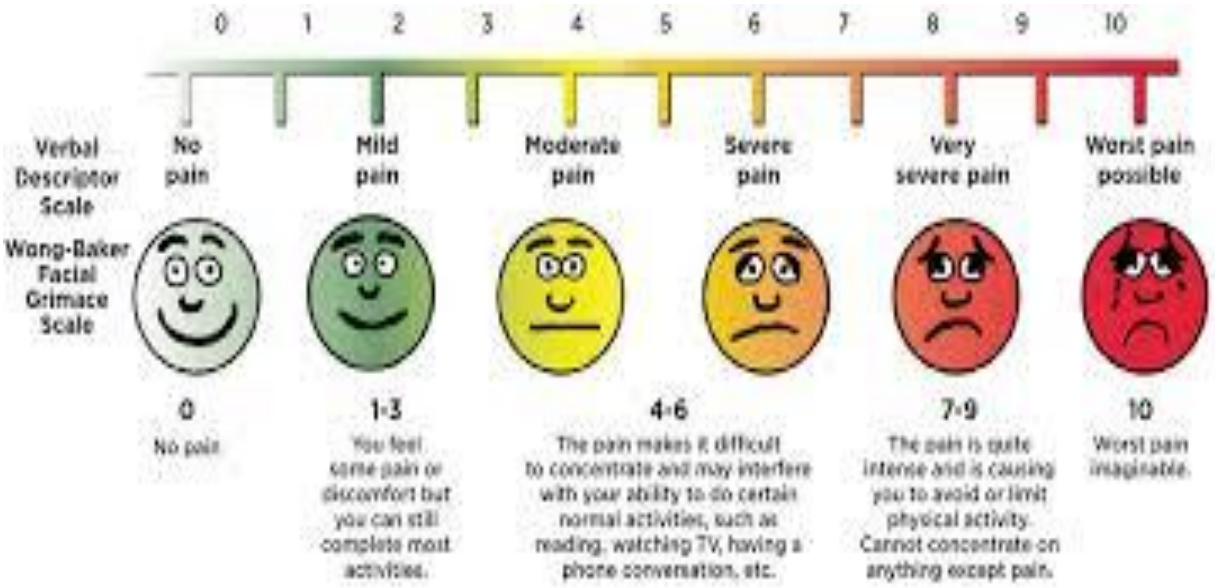

Figure 3 visual analogue scale of pain (8).

Results

The degree of pain was assessed on the basis of Visual Analogue Scale (VAS) with significant pain as more than 5/10. The data was analyzed on SSP. P value was calculated to be less than 0.05. Data was presented as proportion and percentages. Pain was significantly less in group 2 as shown in (table 1).

The early ambulation and early breast feeding were significantly better in group two as shown in (table2)

Table (1) Post-operative Visual Analogue Scale of pain scores in both groups

item	Pain score	Group one(classic closure)	Group two(new technique)	P value
Pain score in the first two hours postoperative	No pain Mild Moderate severe	20(6.6%) 115(38.3%) 135(45%) 30(10%)	50(16.6%) 123(41%) 122(40.6%) 5(1.6%)	0.0001 0.5 0.2 0.00001

	Group one(classic group)	Group two(new technique)	P value
Early ambulation(first 2hours	210(70%)	250(83.3%)	0.0001
Breast feeding(in first 2hours)	150(50%)	200(66.6%)	0.00003

Table (2) ambulation and breast feeding among groups

Discussion

Cesarean section became an everyday procedure .reduction of postoperative pain in countrieslike Egypt who depends upon general anesthesia is an important step .This allowed earlyambulation, early breast feeding, and early intestinal movements.

Closing the rectus sheath in the usual way by beginning in one angle then continued to the otherangle make tension pain after cesarean sections significant even can affect the stance and gait ofthe patients postoperatively.

The traditional continuous sheath closure makes the patients gait abnormal with forward tilt toprevent tension pain coming from the lower anterior abdominal pain.

The current study was a trial to prevent postoperative pain in elective cesarean sections doneunder general anesthesia .Six hundred patients recruited from the units of obstetrics andgynecology department of Benha university hospital after written consent approval.

Participants divided into two groups three hundred in each group.Group one (the classic closure) entailed suturing the rectus sheath continuously from one edgeto the other. In group two the sheath closure began in the midline to the left edge by separatesuture then the right edge sutured to the midline by a separate suture. Both suture ends tied again in a returning manner at the central part of the rectus sheath.

The new technique entailed closure of the rectus sheath by vicryl no 00 in two separated halvesso tension on the sheath will be spread over the two halves reducing tension pain postoperativelyAll cases evaluated by visual analogue scale of pain graded from 0 to 10 as shown in (table 1) alltypes of pain from mild to severe were highly reduced with p value <0.05. The early postoperative period specially the first two hours was good in group two with the newtechnique.

NICE guidelines in cesarean sections 2011 stated the following (We did not identify any RCTsthat looked at closure of rectus sheath at CS). (7)

The technique implied suturing the rectus sheath in two halves separately beginning from the Centre and returned in a second layer to the center again for easy approximation this allow early ambulation with reduction of postoperative pain.

Most of the articles evaluate the use of non -steroidal anti-inflammatory drugs and intravenousmorphia for the reduction of postoperative pain in cesarean sections .

Conclusion

The new two halves rectus sheath closure carries important advantages for patients delivered by cesarean sections.
The new technique significantly reduced postoperative pain and allowed for early ambulation

and breast feeding

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Conflict of interest

Nothing to declare about the presented work

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