

Post Operative Analgesic Effect of Tramadol and Xylocain Infiltration

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Abstract:

Objectives: We investigate the benefit of xylocain tramadol combination wound infiltration for post operative analgesia .

Background: Postoperative pain management one of the concerns in surgery especially caesarean section and local anesthesia wound infiltration play a role in decreasing post operative pain.

Method: 300 patients of 18-46 years under going caesarean section divided randomly to four groups. After wound closure, the first group of 100 patients received paracetamol 10mg/kg and tramadol 1.5 mg/kg intravenously with skin infiltration around the wound using 20 ml 1% xylocain. The 2nd group of 100 patients received paracetamol 10 mg/kg and skin infiltration using 20 ml of 1% xylocain with 1.5 mg /kg tramadol added together, the 3rd group of 50 patients received tramadol 1.5mg/kg infiltration without xylocain or additional analgesia and the 4th group of 50 patients received 20 ml of xylocain only

Results: There were statistical significant reduction of pain at the 8th and 12th hour of pain observation $p < 0.05$ among patients group received tramadol and xylocain infiltration and patients group received xylocain infiltration and tramadol intravenously . Moreover, differences proved statistically $p < 0.05$ at the 8th and 12th post- operative observation hours in reduction of pain among patients group received tramadol and xylocain infiltration, patients received xylocain infiltration only, and those received tramadol infiltration only.

Conclusions: combination of xylocain and tramadol extend the pain free period post operatively twice the period each one alone and reduce analgesic demand until the end of 12th hour, tramadol is good alternative to xylocain for surgical wound infiltration.

Keywords: Tramadol, combination drugs , postoperative pain , infiltration, xylocain

I. Introduction

Postoperative pain management play important role in surgery in order to facilitate earlier hospital discharge[1] inadequate analgesia during the postoperative period may have various short and long-term consequences.[2, 3]. According to some neural pain pathway theories elimination of some superficial causes of pain after caesarean section could modulate perception of deeper visceral pain[4]. Local anaesthetic effects of opioids have been demonstrated in both clinical and laboratory studies[5] .

Tramadol is weak opioid and effective local anaesthetics in minor surgeries[5]. It has selective effect on the N receptors with local anaesthetic action on peripheral nerves. Local anaesthetic effect of tramadol demonstrated by directly administering tramadol onto the sciatic nerve of rat[6]. Tramadol is an analgesic with different spectrums of activity. It causes activation of both opioid and nonopioid (descending monoaminergic) systems, which are mainly involved in the inhibition of pain. The effect of the nonopioid component of tramadol mediated through $\alpha 2$ agonistic and serotonergic activities by inhibiting the reuptake of the norepinephrine and 5-hydroxy- tryptamine, and possibly by displacing stored 5-hydroxytryptamine from nerve endings[6, 7]. Moreover, as a weak opioid, tramadol is a centrally acting analgesic selective for μ -receptors, with local anaesthetic actions on peripheral nerves[8].

According to Cochrane Researchers, local anaesthetics are part of integrated pain management strategies for caesarean section operations, if consideration given to the cost. Local anaesthetics can give, in addition to general or regional anaesthetics, to manage pain during and after operations. The local anaesthesia either injected to block nerves in the abdominal wall or applied directly to the wound[9]. Another study done by Bahanur Cekic, [10] observed that wound infiltration of tramadol provided longer-lasting analgesia compared to levobupivacaine in children undergoing unilateral inguinal hernia repair and undescended testis surgery, and that the requirement for additional analgesic was lower. Altunkaya. Demonstrated that the duration of post-operative analgesia provided by subcutaneous wound infiltration with tramadol was longer in comparison with

those who received lidocaine[11]. Wound infiltration with tramadol extend the pain free period after flank incisions[12].

In the current study, we tested the hypothesis that adding tramadol to xylocain for local infiltration is effective post-operative analgesia to patients undergoing caesarean section operation.

II. PatientsAnd Method

300 patients of 18-46years old undergoing elective caesarean section at AL- Hayat private hospital from January to November 2013 involved. This trial performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. Informed written consent obtained from all patients, and the local institutional ethics committee approved the protocol.

Patients fit to general anaesthesia according to American Society of Anaesthesiologist (ASA class 1). They were assigned to four groups all received the same standardized general anaesthesia. At the end of surgery after wound closure , the 1st group (group A) of 100 patients received paracetamol 10mg/kg and tramadol 1.5 mg/kg intravenously with skin infiltration around the wound using 20 ml 1% xylocain.

The second group (group B) of 100 patients received paracetamol 10 mg/kg and skin infiltration using 20 ml of 1% xylocain with 1.5 mg /kg tramadol added together, while,

The third group (group C) of 50 patients received tramadol 1.5mg/kg infiltration without xylocain or additional analgesia and the fourth group (group D) of 50 patients received 20 ml of 1% xylocain infiltration only. Inhalational agent stopped, muscle relaxation reversed, and the patients monitored until adequate recovery .Patients discharged when their Aldret score is 10 and they can obey verbal commands. All patients monitored for post- operative pain immediately postoperatively, after 1 hour, then 4 hour and 12 hour. The patients were asked if they need additional analgesia or not and the point they require additional analgesia was recorded and compared as it considered to be the point of end of local anaesthetic action. Statistical analysis was made by spss statistical program version 20 using nonparametric Mann –Whitney U test to compare groups. Statistical significance was considered as a P value <0.05. Results presented by mean, standard deviation (SD).

III. Result

No statistical significant of pain perception $p > 0.05$ was found between group C and D that received tramadol and xylocain infiltration each one alone in all observation periods. Table 1

Also, there was no statistical significant $p > 0.05$ among patients group received tramadol intravenously and xylocain infiltration , and patients group received xylocain and tramadol infiltration at recovery period , 1st hour and 4th hour post-operative observations, while there were statistical significant $p < 0.05$ differences between the same groups at the 8th and 12th post-operative observation hours ,Table (2).

The current study revealed no statistical significant $p > 0.05$ among patients received tramadol and xylocain infiltration and patients received xylocain infiltration only at recovery period , 1st hour and 4th hour post - operative observations,

In addition, there was no statistical significant $p > 0.05$ differences between patients group received tramadol and xylocain infiltration and those received tramadol infiltration only at the same observation periods before. On the other hand, differences proved statistically $p < 0.05$ at the 8th and 12th post- operative observation hours, Table (3, 4).

IV. Discussion

Post caesarean section pain control play an important role for obstetrics, since increase hospital stay and made mothers unable to take care of their babies.

It found no significant differences in all observation times between groups received tramadol infiltration and those received xylocain infiltration Table 1.

This finding approve the local anaesthetic effect of tramadol demonstrated in previous studies and that effect is equal to other local anaesthetic drugs like xylocain [13]. However, the exact mechanism of action of tramadol locally still unclear whether by stabilizing cellular membrane as xylocain or by another mechanism that depend on the concentration of Ca^{+} in the medium causing increase activity of tramadol[14, 15].

On the other hand, no significant differences between Infiltration of both xylocain and tramadol and tramadol intravenously along with xylocain infiltration at observation period of recovery, 1hr and 4th hour but there were significant decrease in pain perception observed in xylocain and tramadol infiltration group during 8th and 12th hour of observation Table2,

Variation of tramadol pharmacokinetics given local or parenteral could explain this result, supported by Nossaman VE, [16] who noticed that locally infiltrated tramadol achieved longer analgesic time than the

reported elimination half-life of parenteral tramadol, which might related to its local effect rather than to systemic absorption.

Khajavi MR,[17] state that Subcutaneous wound infiltration with tramadol reduces post- operative opioid consumption and produces less nausea and vomiting than does intravenous administration. Using tramadol by infiltration way rather than intravenous rout in this study has been claimed to be safe and effective in reducing post-operative pain. [17, 18]

In the current study, there were statistical significant reduction of pain perception when xylocain and tramadol in filtered around the incisional wound rather than each one alone at the 8th and 12th hour of pain observations, Table 3, 4. This finding is difficult to explain as the exact mechanism of action of tramadol with xylocain still not fully understood , although , it could be due to factors related to the medium ion concentration or certain modifications in both drug action and elimination.

The efficacy of combining intraarticular local anaesthetics and opioids possess certain importance but experience has been discordant [19].

Combination of bupivacaine and morphine for wound infiltration in abdominal surgeries was associated with better postoperative analgesia and reduced analgesic consumption and explain that by inflammation disrupts the perineuriun as well as increases the number of peripheral sensory nerve terminals and infiltration performed after completion of surgery when inflammatory response may have begun[20]. Although, this require further studies focusing on the combination of local anaesthetics with tramadol at infiltration site.

As a conclusion, tramadol is good local anaesthetic and could use as an alternative to xylocain.

Application of tramadol as infiltration reduce the side effects associated with same dose giving intravenously and decrease the number of dosing.

Combination of xylocain and tramadol extend the pain free period post operatively twice the period each one alone and reduce analgesic demand until the end of 12th hour.

We recommend further investigation about tramadol and xylocain combination at different site of infiltration and different type of operation.

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Tables

Table 1: comparison between patients groups received tramadol infiltration (group C) and xylocain infiltration (group D).

Patient group	No.	Recovery period	1 st hour	4 th hour	8 th hour	12 th hour
group.(C)	50	0.22±0.418	0.24±0.431	0.3±0.462	1±0.0	1±0.0
Group D	50	0.20±0.404	0.26±0.443	0.34±0.478	1±0.0	1±0.0

Table2: comparison between patients groups received tramadol intravenously and xylocaininfiltration(group A)and patients group received xylocain and tramadol infiltration(group B) at different periods of pain observations by mean± standard deviation .

Patients group	No.	Recovery periods m±sd	1 st hour m±sd	4 th hour m±sd	8 th hour m±sd	12 th hour m±sd
group(A)	100	0.13±.338	0.17±0.378	0.25±0.435	0.80±0.402*	1.00±0*
group(B)	100	.17±0.378	0.18±0.386	0.19±0.394	0.25±0.435*	0.32±0.469*

*P<0.05

Table 3: comparison between patients groups received receivedxylocain and tramadol infiltration (B) and patients received tramadol infiltration only(C) at different periods of pain observations by mean± standard deviation.

Patient group	No.	Recovery period	1 st hour	4 th hour	8 th hour	12 th hour
group.(B)	100	.17±0.378	0.18±0.386	0.19±0.394	0.25±0.435*	0.32±0.469*
Group C	50	0.22±0.418	0.24±0.431	0.3±0.462	1±0.0*	1±0.0*

*P<0.05

Table4: comparison between patients groups received receivedxylocain and tramadol infiltration (B) and patients received xylocain infiltration only (D) at different periods of pain observations by mean± standard deviation .

Patient group	No.	Recovery period	1 st hour	4 th hour	8 th hour	12 th hour
group.(B)	100	.17±0.378	0.18±0.386	0.19±0.394	0.25±0.435*	0.32±0.469*
group (D)	50	0.20±0.404	0.26±0.443	0.34±0.478	1±0.0*	1±0.0*

*P<0.05