SUMMARY

Its will known fact that many patients experiences moderate to severe pain after surgery due to inadequate pain treatment, and every effort should be made to overcome. This phenomenon, one of the most sever types of postoperative pain has been reported after thoracic surgery ***(Conacher, 2001).***

Thoracotomy incision is considered one of the more painful incisions; the pain is mainly a result of cutting of the muscles between the ribs and spreading the ribs apart. After surgery, every breath the patient takes expands the chest and spreads the incision to cause sever painful sensations ***(Chia et al, 2006)***

Some patients develop chronic postthoracotomy pain, that may last for months or years, in addition, sever postoperative pain contributes to postoperative pulmonary dysfunction, so the choice of perioperative analgesic technique may play an important role here ***(Udre et al., 2003).***

The epidural analgesia has been known since the beginning of the last century therefore, its basic effects are considered to be clear, thoracic epidural analgesia has been considered to have a good anesthetic efficacy and to decrease postoperative pain and complication rate ***(Armon et al., 2007).***

The aim of this study was to reach a combination that could be injected in the epidural space to relief postthoracotomy pain thorough the comparison among the groups of our study, putting into consideration the efficacy and adverse events of thoracic epidural injections and continuous infusions; as regard its efficacy in decreasing pain and its lower incidence of side effects and complications; we are aiming at the end to reach the best combination in controlling acute pain after thoracotomy whether at rest, walk, or during coughing.

This study was conducted on 60 patients of ASA physical status I- II –III scheduled for thoracotomy. The age of the patients was >20 years and <67years old. The weight of the patients ranged from 38 to 110 kg.

Patients were divided into three groups M, F, and **N** according to the combination infused in the thoracic epidural catheter

Group M: in this group 20 patients had thoracotomy and received magnesium sulfate infusion in the thoracic epidural catheter over 24 hr to control their acute post thoracotomy pain.

Patients of this group received a rate of 6ml/h of the combination of (Bupivacaine 0.125% + magnesium sulfate 2% aiming at to infuse 100 mg/h i.e. 100mg/6ml).

Group F: in this group 20 patients had thoracotomy and received fentanyl infusion in the thoracic epidural catheter over 24 hrs to control their acute post thoracotomy pain.

Patients of this group received a rate of 6ml/h of the combination of (Bupivacaine 0.125% + Fentanyl 2μg/ml conc.).

Group N: in this group 20 patients had thoracotomy and received neostigmine infused in the thoracic epidural catheter over 24hs to control their acute post thoracotomy pain.

Patients of this group received a rate of 6ml/h of the combination of (Bupivacaine 0.125% + Neostigmine 7μg/ml)

All the following data recorded started from the third hour, the fourth hour, the eighth hour, the twelfth hour, and lastly the twenty four hour.

1- Hemodynamics parameter:

- Arterial blood pressure (ABP).
- Heart rate (HR).

2- Respiratory parameter:

- Respiratory rate (RR).
- Arterial blood gases (ABG) in the form of the following: PaO2, pH, PaCO2, HCO3.

3- Level of analgesia:

- Numerical verbal rating scale (NVRS).
- Visual analogue scale (VAS).

4- The level and quality of sedation:

- By Ramsay sedation scale (RSS).

The results of our study were as follow:

As regard our comparative study among the 3 Groups (**M** = magnesium , **F** = Fentanyl , **N** = neostigmine), we was found that: **Group F** has the best results in comparison with the other 2 Groups (**M, N**) according to : visual analogue scale (VAS) , verbal numerical rating scale (VRS) , sedation scale(Ramsay sedation scale), haemodynamic parameters (systolic blood pressure , diastolic blood pressure , and heart rate) , respiratory rate , arterial blood gases (ABG) as regard (pH , PaO2 , $PaCO_2$, HCO_3) .

In comparing group **F** with group **M**, it was found that:

Group **F** is superior to group **M** as regard to better hemodynamic stability, better respiratory parameters, better pain scores, better sedation scores, and lower rate of complications.

* In comparing group **F** with group **N**, it was found that:

Group **F** is superior to group **N** as regard to better hemodynamic stability, better respiratory parameters, better pain scores, better sedation scores, and lower rate of complications.

* In comparing group **M** with group **N,** it was found that:

Group **N** is superior to group **M** as regard to better hemodynamic stability, better respiratory parameters, better pain scores, better

sedation scores but group **M** had a lower number of complicated patients than that in group **N.**

As regard the complications:

No complications related to the technique, or major catastrophic complications had occurred, but only the following:

In Group M: only 5 patients i.e., 25% of the patients of this group are complicated (2 patients developed hypotension and other 3 patients developed nausea and vomiting).

In Group F: only one patient i.e., 5% of patients of this group developed hypotension only.

In Group N: we have 8 patients complicated i.e., 40% of the patients of this group (3 patients developed hypotension and other 5 patients developed nausea and vomiting).

Through our study, it was found that failed technique to reach the epidural space had occurred in one patient only in each group and that patient had excluded and replaced by another one, who was scheduled for thoracotomy and also in **Group M** we met one patient who had failed the analgesic technique in that patient and also that patient had been excluded and replaced by another patient, who was scheduled for thoracotomy, all this replacement to keep all groups to be equal in number to be 20 patients. So if we arrange and put the three groups in order scheme; we will find the following:

Group F > group N > group M, according to this order we can say that Fentanyl in addition to Bupivacaine infusion in the thoracic epidural is the best combination in controlling acute post-thoracotomy pain.

Conclusion

In conclusion, the thoracic epidural infusion of Fentanyl has been proven to be useful, simple, safe and reliable. All the patients with thoracotomy and suffering from postthoracotomy pain can be controlled with thoracic epidural fentanyl infusion that is approved to be as safe, reliable, effective, and has the least side effects in comparison with the other two groups, so the fentanyl group is superior to the other groups in many aspects including:

- Better hemodynamic stability.
- Better respiratory parameters.
- Better pain scales (VAS, VRS) whether in rest or during coughing, and better sedation.
- The least group in side effects especially hypotension (only one patient), and nausea and vomiting (zero patient i.e. no patient develop nausea or vomiting).

The use of Fentanyl in patients with thoracotomy received Bupivacaine 0.125% + Fentanyl 2μg/ml conc., at a rate of 6ml/h. has been shown to be safe and effective.

So if we arrange and put the three groups in order scheme; we will find that group F > group N > group M.

According to this order we can say that the addition of fentanyl to bupivacaine and the infusion of their combination (fentanyl 2ug/ml + bupivacaine 0.125%) in the thoracic epidural catheter is the best combination in controlling acute postthoracotomy pain.