

Tranexamic Acid For Seroma Reduction

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ABSTRACT

Objective To compare the safety and effectiveness of tranexamic acid in reducing postoperative seroma formation in ventral hernia repair.

Study design Comparative study.

Place & Duration of study Department of Surgery Ward 21 Unit IV, Jinnah Postgraduate Medical Centre (JPMC) Karachi, from July 2019 to February 2020.

Methodology Patients with ventral abdominal hernia were included in the study. Study was approved by institution review board. A detailed history and clinical examination were done and routine biochemical investigations requested. Patients were operated after informed consent. Standard Onlay mesh repair was performed. Patients were divided into study and control groups. Tranexamic acid was given postoperatively to study group till 5th postoperative day (POD). Drains were placed under the skin flaps to record the volume of seroma after surgery. The outcome was assessed by comparing the volume of seroma postoperatively in both the groups.

Results Sixty patients were enrolled with female to male ratio of 3:1. Mean age of the patients was 41.67±9.76 year. Twenty-one (35%) patients were <35 years of age. Mean volume of seroma formation in postoperative period in study group was 74.00±35.92 ml versus 130.00±055.96 ml in control group, which was highly significant (p= 0.001). Patients were stratified according to age and gender which showed no significant difference in relation to these variables.

Conclusion Tranexamic acid is effective in reducing the volume of seroma postoperatively in patients with ventral hernia repair.

Key words Tranexamic acid, Fibrinolysis, Plasminogen, Seroma.

INTRODUCTION:

Abdominal hernia is defined as the bulging of part or whole of the contents of the abdominal cavity through a weakness in the abdominal wall.¹⁻³ Hernia repair is the most commonly performed operations worldwide 10-14%.^{4,5} Patients undergoing major surgeries like abdominal hernia mesh repair are at an increased risk of developing seroma. The larger the area of repair with meshes, the higher the risk

of seroma formation and its complications. Apart from this, other risk factors include age, amount of tissue removed, previous surgeries, use of heparin or oral anticoagulant and previous history of seroma.⁶ Postoperatively seroma occurs in 5.6% to 42% of cases of abdominal hernia repairs using mesh.⁷

A seroma is defined as the collection of fluid occurring after surgical procedure. Etiology behind the seroma formation is controversial. It is considered to be the collection of liquefied fat, serum, inflammatory exudates and lymphatic fluid under skin flap.⁸ The amount and duration of seroma formation varies and influenced by many factors like extent of dissection and method of raising the skin flap such as electrocautery, knife or scissors. Plasmin system also contributes towards collection of fluid due to its fibrinolytic activity in serum and lymphatic system. Fibrin complexes further contribute in leakage of

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blood and lymph from the vessels.

Different techniques are used to prevent and manage seroma.^{9,10} Suction drains are used to monitor the amount on of seroma postoperatively.^{11,12} Most of the times seroma resolve on its own but larger ones are treated by needle aspiration. Infected seromas often require antibiotics and sometimes surgery is needed. The seroma formation can be prevented by use of tranexamic acid.¹³ It is a synthetic antifibrinolytic agent, derivative of the amino acid lysine. When fibrinolysis exceeds coagulation, surgical bleeding can ensue despite proper application of bleeding control methods. Tranexamic acid is given to inhibit the process of fibrinolysis. It prevents the activation of plasminogen to plasmin. It can be administered orally or I/V.¹⁴ The rationale of this study was to compare the safety and effectiveness of tranexamic acid in reducing postoperative seroma formation in abdominal hernia repair.

METHODOLOGY:

This comparative study was conducted in the Department of Surgery Ward 21, Jinnah Postgraduate Medical Centre Karachi, from July 2019 to February 2020. Sixty patients were included and divided into two groups, a control and study groups with 30 patients each. All the patients were admitted from the surgical outpatient with the diagnosis of ventral abdominal hernia. Patients suffering from strangulated or recurrent hernias, cirrhosis, uncontrolled diabetes mellitus and bleeding disorders, were excluded. Patients taking anticoagulants were advised to stop this drug five days prior to the surgery.

A detailed clinical history was taken and examination performed. Anesthesia and surgery related laboratory investigations were carried out. Ultrasound of abdomen and pelvis was done to estimate the size of defect along with its content and the status of abdominal viscera. Anesthesia fitness and informed consent were taken. All patients received the standard surgical Onlay mesh repair. Vacuum drain was placed to monitor the volume of seroma. Postoperatively IV tranexamic acid 1gm I/V stat was

given at the closure of skin and 500 mg by oral route 12 hourly till the 5th postoperative day to all patients in the study group. Daily drain output was documented. Drain was removed on 5th postoperative day or when wound drainage was less than 30ml/24 hours.

Descriptive statistics were used to present numerical and categorical data. Stratification of results was done according to the age and gender. Post stratification Chi square test was used for statistical significance. A p value of <0.05 was taken as significant.

RESULTS:

Sixty patients were included in this study with female to male ratio of 3:1. The mean age of the patients was 41.67±9.76 year. Twenty-one (35%) patients were less than 35 years of age. The mean volume of seroma formation was significantly lower in study group as compared to the control group (74.00±35.92 ml versus 130.00±055.96 ml; p<0.001), with a mean difference of 58 ml in both the groups.

There was no significant difference in relation to age (p=0.179) and gender (p=0.627) after stratification among the groups (table-I).

DISCUSSION:

Ventral abdominal hernias are classified as a non-inguinal and non-hiatal defect in the anterior abdominal wall. The risk to develop hernia after laparotomy is 10%. With muscle splitting incision it is reported in 5% and after laparoscopy in 1%. A hernia surgery protocol should be simple, safe and accepted by the patient and feasible for the surgeon as well.^{15,16} Mesh repair has revolutionized the hernia repair. Patients who were considered unfit for hernia repair in the past are now effectively treated with mesh repair without any major morbidity.^{17,18}

Although prosthesis-related infection are rare, it remains a major dilemma. This is encountered in approximately 5% of repairs and delays healing. Pre-existing infection or ulceration of the skin, morbid obesity, incarcerated or obstructed bowel with perforation are major risk factors.¹¹ Seroma is an

Table I: Comparison of Seroma Formation In Relation To Effect Modifiers - Age & Gender

Effect Modifier	Group Stratification	Number of Patients (n)	Mean + SD	p- value
Age (year)	20-35	21	80.05+40.76	p=0.179
	36-60	39	108.97+ 59.96	
Gender	Male	15	96.00+ 34.34	p=0.627
	Female	45	104.00+59.93	

annoying complication for both the surgeon and the patient. Anxiety, discomfort, multiple follow up visits, increased costs, feeling of being unwell, all add to the morbidity. Seroma is a good culture medium for the proliferation of bacteria and may result in wound dehiscence and septicemia. In this study seroma was a common complication. The study done by other authors on the evaluation of risk factors reported no impact of age and gender on seroma formation.^{19,20} Same was observed in our study.

Factors like extent of tissue dissection and surgical methods have established role in the amount and duration of seroma formation postoperatively. Several measures have been adopted over the years to treat seroma formation and its related complications. The systemic use of tranexamic acid is increasingly reported for reducing seroma formation. It also helps in wound healing. In this study tranexamic acid was found effective in reducing the seroma formation. This was also reported in another study where tranexamic acid was used for first 48 hours and decrease in postoperative seroma was noted.²¹

CONCLUSION:

Tranexamic acid is effective in reducing seroma formation in postoperative period in patients who underwent ventral hernia repair.

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- Received for publication: 09-07-2021
Accepted after revision: 05-10-2021
- Author's Contributions:
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Shahid Rasul: Critical review and final approval.
All authors approved final version of manuscript.
- Ethical statement: Institution review board permission obtained prior to study informed consent was also taken.
- Competing Interest:
The authors declare that they have no competing interest.
- Source of Funding: None
- How to cite this article:
Dawani S, Ahmed H, Jafferi S, Rasul S. Tranexamic acid for seroma reduction. *J Surg Pakistan*. 2021;26 (3):117-20. Doi:10.21699/jsp.26.3.8.