Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v2023i1.211
*Biol. Clin. Sci. Res. J., Volume, **2023**: 211*
Original Research Article

ROLE OF TRANEXAMIC ACID IN PREVENTING SEROMA FORMATION AFTER VENTRAL HERNIA REPAIR

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(Received, 9th September 2022, Revised 21st February 2023, Published 23rd February 2023)

Abstract: *The current analysis aimed to evaluate the role of tranexamic acid in preventing seroma formation after ventral hernia repair. This cross-sectional study was conducted at Bakhtawar Amin Trust Hospital Multan from 20th Jan 2020 to 20th Jan 2021. The study included patients diagnosed with ventral hernia repair. Those with cirrhosis, strangled hernias, uncontrolled diabetes mellitus, and bleeding disorders were excluded. The volume of seroma was measured using a vacuum drain. On the fifth post-operative day, 500 mg of oral tranexamic acid was given for 12 hours, and 1gm of IV tranexamic acid was given after skin closure. Statistical significance was calculated using the Chi-square test. P-value < .05 was considered statistically significant. A total of 110 patients were included in the study. 82 (74.5%) were females, while 28 (25.5%) were male. The patients were aged 45 years. Postoperatively, in 89 patients (81%), the seroma resolved in 5 days; in 21 patients (19%), it took more than 5 days to subside. Tranexamic acid significantly reduces post-operative seroma formation in ventral hernia repair.*

Keywords: Ventral hernia repair, Seroma formation, Tranexamic acid

Introduction

An abdominal hernia is a condition that occurs when the contents of the abdominal cavity bulge out of the weak area of the abdomen. It mainly results from the bulging of the omentum or intestine from the defect in the abdominal wall. Hernias can be located between the hips and chest and are commonly repaired through surgical intervention (LASHARI et al., 2020). Major surgical processes such as hernia repair are associated with a high risk of seroma formation. History of surgery and seroma formation, area of dissected tissue, anticoagulant use, and age are related risk factors (Cho et al., 2019). The collection of fluid is called serum; post-surgery is called seroma. It results due to leakage from damaged lymphatics and blood vessels. Suction drains commonly evacuate these. Fluid collected in the closed cavity can also be monitored using these drains (Othman et al., 2012). In 5.6%-42% of cases of abdominal hernia repair, seroma forms postoperatively (Purushotham et al., 2017). It is swelling below the skin, and the fluid appears yellow or clear (Winkelmann et al., 2016). Upon infection, the fluid may become purulent or blood-stained. The small amount of fluid can be treated conservatively, but for a larger amount, either open drainage or needle aspiration is required (Lee et al., 2021). The hernia repair using mesh leads to fluid accumulation. The risk of seroma formation increases with an increase in the area repaired using mesh. Tranexamic acid can be used for the prevention of seroma formation (Stansfield et al., 2020). It has anti-fibrinolytic action, which prevents and treats excessive bleeding during the early stages of healing. Tranexamic acid prevents the activation of plasminogen to plasmin, which causes a 34% decrease in post-operative bleeding (Slattery et al., 2019). The study aims to evaluate tranexamic acid's impact in preventing seroma formation post-ventral hernia repair.

Methods

The cross-sectional study was conducted at Nishtar medical university & hospital Multan from 20th Jan 2020 to 20th Jan 2021. The study included 110 patients diagnosed with ventral hernia repair. A

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consecutive non-probability sampling technique was used. Those with cirrhosis, strangled hernias, uncontrolled diabetes mellitus, and bleeding disorders were excluded. Patients were advised to stop taking anticoagulants five days before surgery. Laboratory investigations and clinical history were recorded. The size and content of the defect were estimated through ultrasound of the pelvis and abdomen. The standard-only mesh was used in all patients. The volume of seroma was measured using a vacuum drain. On the fifth post-operative day, 500 mg of oral tranexamic acid was given for 12 hours, and 1gm of IV tranexamic acid was given after skin closure. Drain output was documented daily. The drain was removed when output was < 30ml in a day. The ethical review committee approved the study ref# 11-27 dated 02-01-2020 to consent from all the included patients. Categorical and numerical data were presented using descriptive statistics. Results were stratified according to gender and age. Statistical significance was calculated using the Chi-square test. P-value < .05 was considered statistically significant.

Results

A total of 110 patients were included in the study. Eighty-two (74.5%) were females, while 28 (25.5%) were male. Patients were 45 years old (20 to 60 years). Fourteen patients (12.5%) were aged between 20-30 years, 27 patients (24.5%) were between 31-40 years, and 41 patients (37.5%) were between 41-60 years. To determine the effect of gender and age on seroma formation, patients were stratified according to these variables (Table-I). Postoperatively, in 89 patients (81%), seroma resolved in 5 days, while in 21 patients (19%), it took more than five days to subside (Table II).

Table-I: Impact of variables on seroma formation

Variables	Stratification	No. Of patients	Mean ±SD	*p*
Age	20-40	41	81.05±41.75	0.179
	41-60	41	109.87±60.94	
Gender	Male	28	95±35.35	0.627
	Female	82	105±58.96	

Table II: Post-operative days and relation to seroma reduction

	Post-operative days	No. of subjects	%	Mean seroma amount ±SD
N=110	< 5 days	89	81%	74±36.82
	>5 days	21	19%	131±54.98

Discussion

Tranexamic acid can be used for the prevention of seroma formation. We administered 1g of tranexamic acid to 110 patients diagnosed with ventral hernia repair. Seroma was resolved in 81% of patients postoperatively. Hernia can be present at different body locations. The abdominal wall is most commonly affected by it (Köckerling and Simons, 2018). Ventral abdominal hernias are non-hiatal and non-lingual defects in abdominal wall fascia. Hernia repair is a common surgical process that accounts for 10-15% of all surgical interventions performed globally (GULZAR et al., 2007). The risk of developing a hernia after laparoscopy, muscle splitting incision, and laparotomy is 1%, 5%, and 10%, respectively. Seromas are common after hernia repair, particularly in those involving a large area and significant tissue disruption. Its etiology is unknown, but it is a collection of serum, lymphatic fluid, liquefied fat, and inflammatory exudates. Various factors, including the method of lifting the skin flap-like knife or electrocautery and depth of dissection, influence the duration and amount of seroma. Untreated seromas develop an infection (Seretis et al., 2017). It also increases the risk of infection. It is an excellent site for bacterial proliferation and causes fatal complications like septicemia and wound dehiscence (Bittner et al., 2019). In this study, seroma was a common complication post-hernia repair. Other studies evaluating the risk factor of seroma formation concluded that age and gender do not affect seroma formation (Cherla et al., 2018; Ferguson et al., 2021; Mukherjee et al., 2017). post-operative serous fluid and seroma formation are effectively decreased by tranexamic acid; it enhances wound healing. A study showed that tranexamic acid subsided seroma, serous fluid, and post-operative soakage in 81% of patients (KHAN et al.). The result of our study shows that it effectively reduces seroma formation. Use of 1g tranexamic acid daily reduces

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post-operative drainage and shortens hospital stays (Zubair et al., 2020). The same results were demonstrated by another randomized, double-blind study in which administering 1g of tranexamic acid reduced post-operative drainage (Ahmed, 2020). Our study's result shows that in most patients, the mean duration of seroma was ten days. Tranexamic acid appears to be an independent factor in seroma reduction, which is the strength of our study.
Our study has some limitations. It has a cross-sectional study design; a retrospective study design will enable comparing results with the control group.

Conclusion

Tranexamic acid significantly reduces post-operative seroma formation in ventral hernia repair. Complications like wound dehiscence and infection are prevented through this.

Conflict of interest

The authors declared the absence of a conflict of interest.

Grant Support & Financial Disclosures

None

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