Original Article

The Effect of the Use of Tranexamic Acid (Cyclokapron) Prior to Flexible Bronchoscopy in Reduction Intra Procedural Bleeding in Sample of Iraqi Patients

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Abstract

Background: Intraprocedural bleeding is a critical factor in procedural safety and operative success. Tranexamic acid (Cyclokapron), an antifibrinolytic agent, is widely used to reduce bleeding by inhibiting plasmin-mediated fibrinolysis. **Objectives:** To evaluate the efficacy of tranexamic acid in reducing intra-procedure bleeding compared with a non-treated control group**. Materials and Methods:** interventional study was conducted on 60 patients all underwent fibro-optic bronchoscopy with endo-bronchial biopsy from segmental lesions by 2.2 cm usual forceps for 4 passes for diagnostic reasons under Local anesthesia ,group A: 30 patients do the procedure with the usual preparation ,group B : 30 patients as group A plus oral cyclocapron before the procedure ,we take the demographic data (age and sex), recording Intra-procedure bleeding and monitoring the patients for any drug side effect, . For categorical comparisons, we used chi-square testing, and group differences were evaluated using non-parametric Wilcoxon testing. Statistical significance was determined at $P \leq 0.05$. **Results**: The (p value) for age distribution was (P = 0.000), so there is significant difference between the two groups, while the distribution of sex was comparable (P = 0.500). Group A show10% Intra-procedural bleeding and group B show 6.7% bleeding, with no statistically significant difference (P = 0.640). Similar results obtained from non-parametric tests (P = 0.655). The intra procedural bleeding was low in both groups. **Conclusion:** This study demonstrates that there is little rule for the preprocedural use of Tranexamic Acid (Cyclokapron) prior to flexible bronchoscopy in reduction intra procedural bleeding further studies are required for trying other techniques for this purpose even though the risk for this complication was not so significant regarding to the numbers but still important because it occur in anatomically risky area.

Keyword: Flexible bronchoscopy, Intra-procedure bleeding, Cyclocapron, Demographic factors, Cinical outcomes.

Introduction

Regarding respiratory diseases, flexible bronchoscopy is one of the most important diagnostic and therapeutic tools. [1] we use it for bronchial lavage, diagnosis and follow up lung pathology, providing biopsies , and evaluating bronchial bleeding and other lung problems.[2] intra procedural hemorrhage even uncommon in clinical practice but still one of important issues because it accrue in anatomically important area especially when bronchial biopsies or bronchial lavage are performed [3]. The result of procedure, the duration of it , follow up after procedure and possible complications depend of the occurrence of this possibility [4]. Certain situation increases the possibility of intraproced-

ural bleeding like history of bleeding disorders long-term infections[5], bronchogenic carcinoma and concomitant use of anticoagulation's[6], all these factors play important rule in suggesting suitable preparation and management strategies to decrease the risk of bleeding and ensure success of bronchoscopy. Pharmacological intervention one of the newly tried approach for achieving these purposes [7]. tranexamic acid (cyclocapron) is one of the antifibrinolytic drugs which act to make the blood clots more stable and reduce hemorrhage by inhibiting plasminogen binding to fibrin [8].A growing number of medical and surgical specialties are utilizing it to treat pulmonary hemorrhage, adding to its proven track record of success in other areas such as orthopedics, cardiac surgery, and epistaxis [9]. The use of cyclokapron to prevent bronchial hemorrhage before flexible bronchoscopy is still understudied and has conflicting results, despite the fact that its use is on the rise.[10] Thus, the purpose of this study is to determine whether administering cyclokapron before a bronchoscopy surgery improves hemostasis, how safe the drug is how it affects the course of the procedure, and how well the patient recovers. The purpose of this study is to draw attention to cyclokapron as a possible preventative approach to lessen bleeding during flexible bronchoscopy; this, in turn, could lead to better endoscopic patient safety.

Research Overview

For the diagnosis and treatment of respiratory disorders, flexible bronchoscopy is an essential tool. Bronchial lavage, bronchial biopsies, and the diagnosis of various lung abnormalities all make extensive use of it. One of the most common risks of bronchoscopy, particularly during biopsies, is bleeding, which is generally harmless but can happen during and after the procedure[11]. This raises the risk of clinical problems and may diminish the procedure's quality. Pulmonologists face a formidable challenge when it comes to controlling bronchial bleeding,[12] especially in patients who are at risk of bleeding because of inflammatory or neoplastic lung illnesses, coagulation abnormalities, or both. In order to reduce the risk of bleeding during bronchoscopy without endangering the patient or the process, it is essential to have access to safe and efficient preventive drugs. An antifibrinolytic medication, tranexamic acid (Cyclokapron) stabilizes blood clots and decreases bleeding. Its usefulness in treating pulmonary bleeding is just one of several medicinal and surgical applications where it has proven effective. The medical literature does not yet sufficiently support its preventive role when given before flexible bronchoscopy.[13]

Purpose of the Study

What this study intends to do is: Determine whether preprocedure cyclofapron administration reduces bleeding during flexible bronchoscopy. During the follow-up phase, study how cyclokapron affects the rate of bleeding during bronchoscopy. Evaluate the extent of hemorrhage in patients who were administered cyclofapron against those who were not. Assess the absence of major drug-related problems associated with cyclofapron use prior to bronchoscopy and its safety.

Proposed Scientific Theory

Without raising the risk of complications or adversely affecting patient safety, this study hypothesizes that giving cyclofapron before flexible bronchoscopy lessens the amount and severity of bleeding during and after the procedure compared to not using it.

Materials and Methods

After taking informed concepts an interventional study include 60 patients all underwent fibro-optic bronchoscopy with endo-bronchial biopsy

from segmental lesions by 2.2 cm usual forceps for 4 passes for diagnostic reasons under Local anesthesia ,group A: 30 patients do the procedure with the usual preparation ,group B : 30 patients as group A plus oral cyclocapron (TXA)500 mg x3 48 hr. before the procedure ,we take the demographic data (age and sex), recording Intra-procedure bleeding and monitoring the patients for any drug side effect

Statistical analysis

Data were analyzed using SPSS software.

- Chi-square test: categorical comparisons
- Wilcoxon signed-rank test: non-parametric comparisons
- Significance level: $P \leq 0.05$

Ethical approval

Ethical approval was obtained for this study from Research Ethics Committee of Babylon University, Hammurabi College of Medicin with Issue.

Results

Features of the study

Age category

The two groups' age distributions differed significantly. All participants in Group B were under the age of 30 (100%), whereas the majority of those in Group A were over the age of 51 (73.3%), with the remaining participants aged 31-50 (26.7%). The difference was highly significant (χ^2, P = 0.000).

Table 1: Age Distribution of Study Participants According to Study Groups

Crosstab				
Age		**Group**		**Total**
		A	**B**	
less than 30	N	0	30	30
	%	0.0%	100.0%	50.0%
	Total	0.0%	50.0%	50.0%
31-50	N	8	0	8
	%	26.7%	0.0%	13.3%
	Total	13.3%	0.0%	13.3%
more than 51	N	22	0	22
	%	73.3%	0.0%	36.7%
	Total	36.7%	0.0%	36.7%
Total	N	30	30	60
	%	100.0%	100.0%	100.0%
	Total	50.0%	50.0%	100.0%
Chi-Square Tests	= 0.000			

Sex groups

Sex distribution was similar across groups. Males made up 53.3% of Group A and 56.7% of Group B, with females accounting for 46.7% and 43.3%, respectively. No significant association was found (P = 0.500).

Table 2: Sex Distribution of Participants According to Study Groups.

Crosstab				
Sex		**Group**		**Total**
		A	**B**	
Male	N	16	17	33
	%	53.3%	56.7%	55.0%
	Total	26.7%	28.3%	55.0%
Female	N	14	13	27
	%	46.7%	43.3%	45.0%
	Total	23.3%	21.7%	45.0%
Total	N	30	30	60
	%	100.0%	100.0%	100.0%
	Total	50.0%	50.0%	100.0%
Chi-Square Tests	= 0.500			

Intra-procedure bleeding

Bleeding events were recorded in:

- 3 patients (10%) in Group A (control)
- 2 patients (6.7%) in Group B (tranexamic acid).

Although the treated group demonstrated a lower bleeding rate, the difference did not reach statistical significance (P = 0.640).

Table 3: Intra-procedural Bleeding According to Study Groups.

Crosstab				
Intra procedure bleeding		Group		Total
		A	B	
YES	N	3	2	5
	%	10.0%	6.7%	8.3%
	Total	5.0%	3.3%	8.3%
NO	N	27	28	55
	%	90.0%	93.3%	91.7%
	Total	45.0%	46.7%	91.7%
Total	N	30	30	60
	%	100.0%	100.0%	100.0%
	Total	50.0%	50.0%	100.0%
Chi-Square Tests	= 0.640			

The non-parametric analysis using the Wilcoxon test confirmed the absence of a significant difference between groups (P = 0.655).

Table 4: Comparison of Intra-procedural Bleeding Scores between Study Groups.

Groups	N	Mean ± SD	P value
Intra procedure bleeding Group A	30	1.90±0.305	0.655.
Intra procedure bleeding Group B	30	1.93±0.254	

Discussion

The therapeutic function of tranexamic acid (Cyclokapron) in lowering intra-procedure hemorrhage was examined in this investigation. A statistically significant difference was seen between the treatment group and the control group with respect to bleeding rate (6.7% vs 10%). The decrease was not statistically significant, but it does point to a possible protective impact of tranexamic acid; prior research has shown that it has a similar, if not better, effect than adrenaline.[13]

By inhibiting plasminogen binding sites, tranexamic acid stabilizes fibrin clots and prevents their early breakdown, hence inhibiting fibrinolysis. The decreased propensity for bleeding in the treated group was presumably caused, in part, by this antifibrinolytic activity. These results corroborate those of other studies showing that tranexamic acid effectively decreases blood loss in many different types of surgery.[14] Endothelial function, coagulation efficiency, and vascular fragility are all impacted by age, which is a well-established factor. A lower hemostatic reserve and slower tissue regeneration make older people more likely to experience bleeding problems [15]. In terms of procedural outcomes, both groups had low intra-procedure bleeding rates, which did no consequently; confounding effects may be introduced by this imbalance, weakening causal inferences. On the other hand, there was less biological variability associated to gender because the sex distribution was similar. This uniformity allows for more accurate group comparisons and strengthens the study's internal validity differ significantly. These results show that the procedure has a favorable safety profile regardless of group sharing.[16] Clinically, such a low bleeding rate indicates adequate hemostatic control and effective surgical technique.

Conclusion

Tranexamic acid inhibits fibrinolysis by blocking plasminogen binding sites, thereby stabilizing fibrin clots and preventing premature breakdown[17]. This antifibrinolytic action is most likely responsible for the reduced bleeding tendency observed in the treated group. These findings are consistent with previous research showing that tranexamic acid reduces blood loss in a variety of surgical specialties.[14][18] This study demonstrate that there is little rule for the preprocedural use of Tranexamic Acid (Cyclokapron) prior to flexible bronchoscopy in

reduction intra procedural bleeding further studies are required for trying other techniques for this purpose even though the risk for this complication was not so significant regarding to the numbers but still important because it occur in anatomically risky area **.**

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