Chest & Heart Journal
Vol. 29, No.-2, July 2005

Role of Tranexamic Acid Nebulization in the Management of Haemoptysis- Experience at NIDC&H

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Abstract:

This study was done to determine the effectiveness of Tranexamic Acid Nebulization in the management of haemoptysis. This prospective randomized case control study was carried out iron January 2002 to December 2002 in the Department of Respiratory Medicine, NIDCH, Dhaka. 50 patients (Male 48, Female 2) admitted to NIDCH with haemoptysis were enrolled in this study. Alternatively, 25 patients were enrolled in group A and in group B respectively. Group B was taken as control group. Group A (n = 25) were treated with Tranexamic Acid Nebulization along with other drugs (Anti TB / Antibiotics / Chemotherapy, Diazepam etc.) and Group B (n = 25) received normal saline Nebulization along with other drugs (Anti TB / Antibiotics / Chemotherapy, Diazepam etc.). In group A, haemoptysis was completely controlled in 3 (12%) case on the 2nd day, 13 (52%) cases on the 3rd day, 4 (16%) cases on the 4th day, 1 (4%) case on the 5th day of Nebulization of Tranexamic Acid. In 4 (16%) cases haemoptysis was not controlled rather deteriorated. In group B, haemoptysis was controlled in only 5 (20%) cases on the 10th days of treatment and in other cases haemoptysis was not stopped within 10 days of treatment.

So, Tranexamic Acid can be used safely in Nebulized form in the management of mild to moderate haemoptysis.

Key Words : *Tranexamic Acid. Nebulization, Haemoptysis*

[Chest & Heart Journal 2005; 29(2) : 113-116]

Introduction:

Haemoptysis is the expectoration of blood that originates below the vocal cord. It is a cause of great anguish to the patient and his/her family and a daunting clinical challenge for the physician. It is commonly classified as trivial or mild, moderate and grave or massive, the last defined as more than 200-600 ml in 24 hours. The dividing line is arbitrary since the amount of blood is rarely quantified with perception[1]. Coughing up blood irrespective of the amount is an alarming symptom and almost always brings the patient to the doctor. A clear history should be taken to establish whether it is true haemoptysis and not haematemesis or epistaxis (Nose bleed). Haemoptysis must always be assumed to have a serious cause until appropriate investigations have proved otherwise. The common causes of haemoptysis are pulmonary tuberculosis, Bronchiectasis, Lung Abscess, Lung Cancer , Acute

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pulmonary infarction Left ventricular failure (LVF), Mitral stenosis. Many episodes of haemoptysis are unexplained even after full investigation and are likely to be caused by simple bronchial infection. A history of repeated small haemoptysis or blood streaking of sputum is highly suggestive of bronchial carcinoma. Chronic fever and weight loss may suggest tuberculosis. Pnpneumonia is often the cause of rusty colored sputum but can cause frank haemoptysis as can all the pneumonic infections which lead to suppuration and lung abscess formation Bronchiectasis can cause catastrophic bronchial bleeding[2] Tranexamic acid is an anti fibrinolytic agent, which competitively inhibits the activation of plasminogen to plasmin. Tranexamic acid is usually used systematically but can be used topically for control of bleeding.

Materials and Methods

This was a prospective case control randomized study carried out from January 2002 to December 2002. Fifty patients of either sex presenting with haemoptysis admitted to NIDCH were included in this study. After proper diagnosis and ruling out the exclusion criteria, the patients were alternately divided into two groups .

Inclusion criteria: Patients having any grade of haemoptysis and those patients who gave consent were included in this study.

Exclusion criteria: Patients of extreme of ages and having life- threatening conditions or shock were excluded from the study. Patients having bleeding disorders and poor co-operation were also excluded from the study. Initially 60 patients were enrolled in this study. Later on 10 patients dropped out. Finally, 50 patients completed the study. there were 48 males and 2 females. The mean age was 35.7 (SD ± 24.9) years with age range of f8-65 years. The patients were divided alternatively into two groups 25 in group A (case) and :25 in group B (control). Group A (n=25) received Tranexamic Acid Nebulization (Tranexamic Acid 25cc. Plus Normal Saline 2cc) 8 hourly. On the other hand, group 13 (n=25) was nebulized with only Normal saline 2cc 8 hourly. Both groups received other definitive treatment and were observed daily.

Study Procedure:

- Informed Consent obtained
- Detailed history taken
- Thorough physical examination done
- Necessary investigations performed to rule out exclusion criteria.
- Questionnaire filled up.
- Group A (n=25) treated with Tranexamic acid Nebulization along with other drugs (Anti-TB/ Antibiotic / Chemotherapy, Diazepam etc.)
- Group B (n=25) received Normal Saline nebulization along with other drugs (Anti-TB/ Antibiotic / Chemotherapy, Diazepam etc.)

Results

All cases were evaluated for diagnosis. Out of 50 patients, 30 had pulmonary tuberculosis Bronchiectasis- 13, Lung Abscess- 4, Lung cancer - 2 and Mitral stenosis- 1 (Table 1). Majority of the patients belonged to 31-40 year age group. Out of 50 cases, 32 had mild haemoptysis. 13 had moderate haemoptysis and 5 massive haemoptysis (Table 2). Group A (n= 25) were treated with Tranexamic Acid Nebulization along with other drugs (Anti-TB/ Antibiotics/ Chemotherapy, Diazepam etc.) and group B received normal saline, Nebulization along with other drugs (Anti-TB/ Antibiotics / Chemotherapy, Diazepam etc.) In group A, (n=25) haemoptysis was controlled after 10 days of treatment in 21 (84%) cases and not controlled in 4 (16%) cases, on the other-hand in group B (n=25) haemoptysis was controlled in 5 (20%) cases and not controlled in 20 (80%) cases (Table 3). In group A, haemoptysis was completely controlled in 3 (12%) cases on 2"d day, 13(52%) on 3'd day, 4 (16%) cases on the 4t" day, 1 (4%) case on the 5th day of Nebulization of Tranexamic Acid. In 4 (16%) patients, haemoptysis was not controlled rather deteriorated. In group B. haemoptysis was controlled in only 5 (20%) cases on the 10'h day of treatment and in other 20 (80%) cases haemoptysis was not stopped within 10 days of treatment (Fig. 1). When group A was compared with group B and Chi-square test was done, the p-value was found to be <0.001 which was highly significant.

Table-I

Diagnosis of Patients n=50

Diagnosis (n=25)	Group A (%)	Percentage (%)	Group B (n=25)	Percentage (%)
Pulmonary Tuberculosis	16	64	14	56
Bronchiectasis	6	24	7	28
Lung Abscess	2	8	2	8
Lung Cancer	1	4	1	4
Mitral Stenosis	0	0	1	4

Table-II

Amount of Haemoptysis

Extent of Haemoptysis	Group A (n=25)	Percentage (%)	Group B (n=25)	Percentage (%)	P-values
Mild	15	60	17	68	NS P=>0.05 Z= 0.56
Moderate	7	28	6	24	NS P=>0.05 Z= 0.32
Massive	3	12	2	8	NS P=>0.05 Z= 0.47

Table-III

Control of Haemoptysis in different treatment groups

Treatment Group	Control of Haemoptysis after 10 days of treatment	
	Controlled	Not Controlled
Group A	21	4 (n=25)
Group B	5	20 (n=25)
x2 = 20.5,	df =1, p= < 0.001,	highly significant

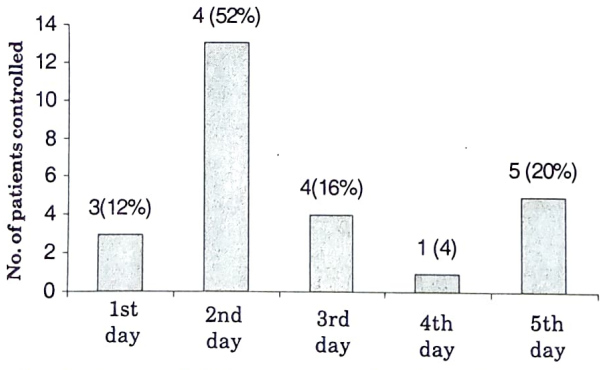

Fig. 1 : *Control of haemoptysis by days of treatment in diferrent treatment groups*

Discussion:

Tranexamic Acid is an anti fibrinolytic agent. it acts principally by inhibiting plasminogen activators as is used in the treatment of hemorrhage or threatened hemorrhage, assocaited with excessive fibrinolysis. It is being used for the control of bleeding of the gastrointestinal and gynecological origin for a long time. Tranexamic Acid is 7 to 10 times sure potent than aminocaproic acid[3]. Although, it can be used topically[4]. therefore, it has never been used in nebulised form in the management of haemoptysis.

We have given Tranexamic Acid in nebulized form in 25 patients in this study to evaluate its efficacy in the management of haemoptysis as a topical agent.

Table 1 shows that majority of patients had pulmonary tuberculosis (n=30, 60%). Thirty-two patients (64%) had mild hemoptysis i.e. less than 100 ml/day followed by moderate (100-200 ml/day) hemoptysis in 13 patients (26%) and severe (200-600 ml/day) hemoptysis in 5 patients (10%). Fig. 1 shows that in group A, majority of patients 13(52%) noticed control on 3rd day; whereas in group B, haemoptysis was controlled in only 5 (20%) cases on the 10th day of treatment. Surgical opinion was sought in patients with uncontrolled hemoptysis.

All patients remained hemodynamically stable during the course of treatment. No systemic on local side effects were observed during therapy and 2 weeks after therapy.

Conclusion:

Tranexamic Acid may be used safely in Nebulized form in mild to moderate haemoptysis. A multi-centre study is required to determine the efficacy of Tranexamic Acid nebulization in larger number of patients.

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