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ORIGINAL ARTICLE

Efficacy of tranexamic acid as pleurodesis agent in malignant pleural effusion



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KEYWORDS

Tranexamic acid;
Pleurodesis;
Malignant;
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Abstract *Design:* A prospective case series.

Aim: On a search for an effective, safe, cheap, and available sclerosing agent, the present study aimed to evaluate the effectiveness and the safety of tranexamic acid as a chemical agent for pleurodesis in malignant pleural effusion (MPE).

Methods: Tube thoracostomy was done for drainage of pleural fluid. Once the tube in the pleural space drains 150 ml per day or less with fully expanded lung, infusion of pleurodesis solution containing 2000 mg of tranexamic acid [four ampoules of tranexamic acid each is 5 ml (100 mg/ml), mixed with 50 ml of normal saline] was done through the intercostal tube. The tube was then clamped immediately and left in the pleural cavity for 2 h. Follow up chest radiographs were done every 24 h till removal of the tube which was done when daily drainage is 100 ml or less. Chest X ray (CXR) was done after three months to judge success (no fluid re-accumulation). The results were statistically analyzed and tabulated.

Results: Sixteen patients with MPE were included in this study, 9 (56%) males and 7 (44%) females with age ranging from 45 to 70 with mean age \pm SD = 57.5 ± 8.3 years. The follow up after 3 months showed a complete response rate (no fluid re-accumulation on CXR) of 75% (12 \ 16), a partial response rate (asymptomatic fluid re-accumulation on CXR) of 12.5% (2 \ 16) and a no response rate (symptomatic fluid re-accumulation on CXR that required pleural drainage) of 12.5% (2 \ 16).

Abbreviations: MPE, malignant pleural effusion; CXR, chest X ray.

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Conclusion: Tranexamic acid was found to be an effective, safe, cheap, and available sclerosing agent for pleurodesis in recurrent malignant pleural effusion.

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Introduction and aim of the work

Pleurodesis is a palliative therapy for symptomatic, recurrent malignant pleural effusions (MPE). The success of pleurodesis depends on the tumor burden, pleural fluid pH, and the efficacy of the selected sclerosing agent [1].

On a search for an effective, safe, cheap, and available sclerosing agent, the present study aimed to evaluate the effectiveness and the safety of tranexamic acid as a chemical agent for pleurodesis.

Methods

This study was a prospective case series, conducted on twenty patients with recurrent pleural effusion admitted at Chest Department, Benha University (Benha city, Egypt) from February 2011 to February 2012.

Patients with recurrent pleural effusion and completely expanded lung were included in this work. Patients with unsuccessful lung re-expansion after tube thoracostomy, Bleeding tendency or terminal disease were excluded.

All patients were subjected to full history taking with general and local examination, chest radiograph (postero-anterior and lateral views), chest C.T scan (was done to detect pleural thickening, loculations or underlying lesion as masses), pelvi-abdominal sonography (to detect abdominal causes of effusion or associated ascites), laboratory investigations (including liver function tests, kidney function tests and coagulation profile), pleural biopsy (with Abram's needle or thoracoscopic pleural biopsy for histopathological examination).

Tube thoracostomy was done for drainage of pleural fluid. Once the tube in the pleural space drains 150 ml per day or less with fully expanded lung which is confirmed on chest X ray [2], infusion of pleurodesis solution containing 2000 mg of tranexamic acid [four ampoules of tranexamic acid each is 5 ml)100 mg/ml), mixed with 50 ml of normal saline] was done through the intercostal tube. The tube was then clamped immediately and left in the pleural cavity for 2 h during which the patient was turned to the supine, prone, right and left lateral decubitus and sitting position so that pleurodesis solution came in contact with all pleural surfaces. The patient was kept in each position for 30 min. After 2 h, the chest tube was unclamped. Follow up chest radiographs were done every 24 h till removal of the tube which was done when daily drainage is 100 ml or less.

The patients were discharged and followed up after three months using plain CXR to judge success of the procedure (no fluid re-accumulation):

1. Complete response (success) means no radiographic evidence of fluid re-accumulation was noted on follow up.

2. Partial response means re-accumulation of fluid that did not produce symptoms and did not require repeat pleural drainage of any sort on follow up.
3. No response means fluid re-accumulation that produced symptoms and required pleural drainage on follow up.

The results were statistically analyzed and tabulated using SPSS program statistical program (version 14, SPSS Inc., USA: Chicago, IL).

Results

Sixteen patients with malignant pleural effusion were included in this study. There were 12 (60%) males and 8 (40%) females. Their age ranged from 45 to 70 with mean age \pm SD = 57.5 ± 8.3 years (Tables 1 and 2).

As regards the side of effusion 9 (56%) cases were left sided pleural effusion and 7 (44%) cases were right sided. The main presenting symptom was dyspnea in 8 (50%) cases and chest pain in 8 (50%) cases (all 8 cases had Mesothelioma).

As regards methods of diagnosis, 8 \ 16 (50%) were diagnosed by thoracoscopic pleural biopsy, 4 \ 16 (25%) were diagnosed by closed pleural biopsy (using Abram's needle) and 4 \ 16 (25%) were diagnosed by positive cytological examination for malignant cells in pleural fluid. The histopathological types of these malignant effusions were Mesothelioma in 8 \ 16 (50%) and Metastatic Adenocarcinoma in 8 \ 16 (50%) cases (Tables 1 and 2).

Regarding the outcome and the response to tranexamic acid pleurodesis 12 (75%) showed complete response, 2 (12.5%) showed partial response and other 2 (12.5%) cases showed no response (Tables 1 and 2). The time for removal of the chest tube after injecting tranexamic acid ranged from 3 to 7 days (mean \pm SD = 4.6 ± 1.25 days).

The failed pleurodesis (no response) in the 2 cases who had malignant mesothelioma was caused by thickening of the pleura seen by Thoracoscopy (Fig. 1 shows one of them) and failure of the lung to expand.

As regards complications, no significant complications were detected after tranexamic acid pleurodesis.

The cost of tranexamic acid in Egypt is about 21 LE (less than 3 US dollars) per pack of six 5 ml ampoules (100 mg per 1 ml).

Discussion

On a search for an effective, safe, cheap, and available sclerosing agent with least side effects, the present study aimed to evaluate the effectiveness and the safety of tranexamic acid as a chemical agent for pleurodesis.

Sixteen patients with MPE were included in this study, 9 (56%) males and 7 (44%) females. Their age ranged from 45

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