

Research Article

Assessment of efficacy of doxycycline for the management of pleurodesis in patients of malignant pleural effusion

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ABSTRACT

Objective: To assess the efficacy of doxycycline for the management of pleurodesis in patients of malignant pleural effusion.

Material and Methods: This cross sectional study was conducted at Department of Pulmonology, Lahore General Hospital, Lahore from July 2018 to December 2018 over the period of six months.

Results: In this study, mean age of 45.67 ± 11.89 years. Male patients were 23 (46%) and female patients were 27 (54%). The efficacy of Doxycycline as pleuridising agent was seen in 21 (42%) of the cases. There was no significant difference in terms of gender and age groups in terms of efficacy with p values of 0.88 and 0.83 respectively. The efficacy was significantly high in cases that had volume of pleural effusion less than or equal to 1 liter where it was seen in 9 (75%) out of 12 cases with p value of 0.001.

Conclusion: The efficacy of Doxycycline for pleurodesis in cases with malignant pleural effusion is optimal and it is significantly high in cases with effusion equal or less than 1 liter.

Key Words: Malignant pleural effusion, Efficacy, Doxycycline

INTRODUCTION

Pleural effusions cover a range of underlying disorders and so are widely seen in almost all the departments and ultimately report to the radiologists for drains and to Pulmonology department for further management plan. Malignant pleural effusion (MPE), pose a great diagnostic as well as therapeutic challenge as it can be highly symptomatic.¹⁻²

There are multiple signs and symptoms indicating underlying MPE and include worsening of shortness of breath, exertional dyspnea, chest pain, may or may not associated with fever, malaise and weight loss. Malignant Pleural effusion like other effusions need to be drained out to avoid compression on lung, to serve as a source of secondary infection and to

avoid adhesion formation. Pleurodesis is the procedure by which, an iatrogenic inflammation is created in the pleural cavity to approximate both the pleural surfaces to avoid further accumulation of fluid in this cavity.³⁻⁴

There are wide variety of pleuridising agents available in the market and include talc in the form of slurry and poudrage, 5- fluorouracil, Bleomycin and tetracycline etc. each having their own advantages and disadvantage. Doxycycline is an oral antibiotic and is easily available and cheap and has revealed a good success rate in the past.⁵⁻⁷

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Pulmonology, Lahore General

Hospital, Lahore from July 2018 to December 2018 over the period of six months. Total 50 cases of malignant pleural effusion (Malignant pleural effusion of at least 500 ml diagnosed on USG chest and malignancy of any duration of type proved either by pleural biopsy or diagnostic pleural fluid cytology) having age 30-80 years either male or female were selected. Patients with traumatic effusion, cases with transudative pleural effusion i.e. CLD, CCF, CRF were excluded from the study.

Pleurodesis was done by using Doxycycline capsules. Initially all the fluid in the pleural cavity was drained by an intercostal chest tube (ICT) and then a paste was made by dissolving 10 capsule, each of 100 mg in 50 ml normal saline and this was injected into the pleural space. This was clamped for 3 hours and then reopened to drain the fluid if collected. These cases were then followed next day by USG chest and if the collection of fluid was less than 100 ml, it was labelled as efficacious.

Data was entered in SPSS version 18 and analyzed. Mean and SD was calculated for numerical data and frequencies and percentages were calculated for categorical data.

RESULTS

In this study, 50 cases of malignant pleural effusion were selected with mean age of 45.67± 11.89 years. There were 23 (46%) males and 27 (54%) females in it. CA breast was the most common etiology seen in 17 cases. The efficacy of Doxycycline as pleuridising agent was seen in 21 (42%) of the cases as in figure 1. There was no significant difference in terms of gender and age groups in term of efficacy with p values of 0.88 and 0.83 as shown in table 1 and 2 respectively. The efficacy was significantly high in cases that had volume of pleural effusion less than or equal to 1 liter where it was seen in 9 (75%) out of 12 cases with p value of 0.001 as displayed in table 3.

Figure No. 1 Efficacy

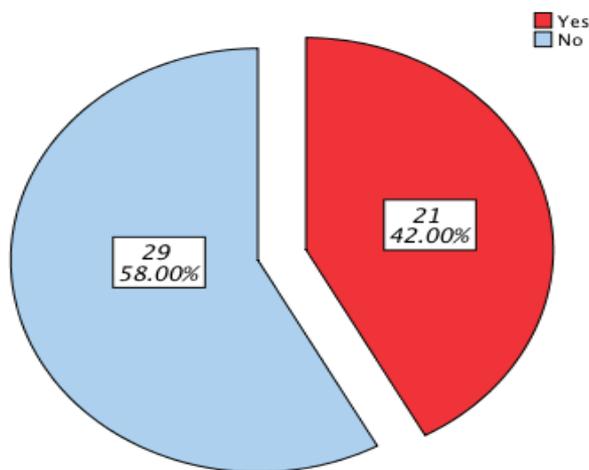


Table No. 01. Efficacy vs Gender

Gender	Efficacy		Total	Significance
	Yes	No		
Male	10 (43.48%)	13 (56.52%)	23	p= 0.88
Female	11 (40.74%)	16 (59.26%)	27	
Total	21 (42%)	29 (58%)	50 (100%)	

Table No. 02. Efficacy vs Age groups

Age groups	Efficacy		Total	Significance
	Yes	No		
30-50	8 (44.44%)	10 (55.56%)	18	p= 0.83
>50	13 (40.62%)	19 (59.38%)	32	
Total	21 (42%)	29 (58%)	50 (100%)	

Table No. 03. Efficacy vs Volume of pleural effusion

Volume	Efficacy		Total	Significance
	Yes	No		
1 liter or less	9 (75%)	3 (25%)	12	p= 0.001
>1 liter	12 (31.58%)	26 (68.42%)	38	
Total	21 (42%)	29 (58%)	50 (100%)	

DISCUSSION

Malignant pleural effusions (MPE) are usually aggressive in accumulation and it is difficult to manage such cases due to high degree of disease and multiple co morbid conditions. On the other hand it has the tendency to recur again and again. That’s why its always required that there should be one agent with best efficacy and minimal side effect profile to provide a long lasting cure in such cases.

The efficacy of Doxycycline as pleuridising agent was observed in in 21 (42%) of the MPE cases in this study. The efficacy in the present study was slightly lower that the previous studies. Porcel et al in their study found this efficacy in 55% of the cases where they studies 34 cases of MPE.⁸ Costa et al, conducted another study with similar design and they found this efficacy in nearly 60% of the cases. This slightly lower efficacy can be explained by the fact that we did not use negative pressure suction after pleurodesis which has shown good results and have been used in the we equipped centres.⁹

This was also strengthened by the study of Mohammed et al, where they found high degree of efficacy of doxycycline and resulted in success rate of 72.7% of the cases.¹⁰ Their result was similar to the study conducted by Heffner et al with efficacy rate of 78%.¹¹ The other possibility of the low success rate can be the difference in the presentation of the cases as majority of the cases in present study presented in advanced severity of the disease that led to lesser efficacy.

The efficacy was significantly high in cases that had volume of pleural effusion less than or equal to 1 liter where it was seen in in 9 (75%) out f 12 cases with p value of 0.001. This was also supported by the studies in the past; although they did not use such cut off values but they

revealed that the higher the degree of pleural effusion and lesser was the success rate. This can be explained by the underlying pathophysiology that difficult to approximate the pleura and higher will be failure rate.¹²⁻¹³

CONCLUSION

The efficacy of Doxycycline for pleurodesis in cases with malignant pleural effusion is optimal and it is significantly high in cases with effusion equal or less than 1 liter.

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