Efficacy of Doxycycline in Pleurodesis in Cases of Malignant Pleural Effusion

Asad Mahmood Khan, Sana Sehar, Afia Munir, Muhammad Ahmad

ABSTRACT

Introduction: Pleural effusions are well-reported entities in Pulmonology department and malignant effusion poses a great difficulty not only for diagnosis but also in terms of its management. **Objective:** To determine the efficacy of doxycycline in pleurodesis in cases of malignant pleural effusions (MPE). **Study Design:** Descriptive cases series**. Setting:** Department of Pulmonology, Sheikh Zayed Medical College / Hospital, Rahim Yar Khan. **Duration:** February 2016 to February 2017. **Sample size:** Fifty cases of malignant pleural effusion. **Sampling technique:** Non probability convenience sampling. **Data collection procedure:** In this study, 50 patients of both genders with age range of 15 to 70 years diagnosed with malignant pleural effusion were enrolled. Ten capsules of Doxycycline were mixed with 50 ml of normal saline and injected intra pleurally. The cases were then followed on next day and after one week and then one month by USG and CXR PA view. The failure of recollection of fluid more than 100 ml assessed on USG was labeled with positive efficacy. **Results:** In the present study, there were 50 cases of malignant pleural effusion (MPE) out of which 34 (68%) were females and 16 (32%) males, with mean age of 36.18± 10.16 years. The efficacy was seen in 26 (52%) of cases. It was better in males where it was seen in 10 (62.50%) of cases as compared to 16 (47.06%) females in their respective groups with p= 0.32. This was better in age group 15 to 40 years where it was seen in 60% of cases as compared to 40% in age group more than 40 with p= 0.08. There was significant better efficacy (p= 0.002) in cases that had pleural effusion less than 1 liter at presentation. **Conclusion:** Doxycycline is a cheaper easily available sclerosing agent with successful pleurodesis in half of the cases with MPE. Its failure rate is significantly higher in cases that had pleural effusion more than 1 liter at presentation.

Keywords: MPE, Pleurodesis, Doxycycline

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Submitted for Publication: 04-05-2017 *Accepted for Publication: 31-05-2017*

Article Citation: Khan AM, Sehar S, Munir A, Ahmad M. Efficacy of Doxycycline in Pleurodesis in Cases of Malignant Pleural Effusion. APMC 2017;11(2):158-160.

INTRODUCTION

Pleural effusions are commonly encountered in outpatient and in patients departments. There is widely variety of etiology and the treatment is done accordingly. In cases of malignant pleural effusion (MPE), there is great concern for its management, as it can not only worse the symptoms but also its recurrence increases the symptoms of the patients.[1,2]

Pleurodesis is the procedure by which the both pleural surfaces are glued to each other by creating an iatrogenic inflammatory response. It can be done via surgical and medical methods. Among medical methods, chemical pleurodesis is the procedure of choice for recurrent pleural effusions.[3,4] The question is the choice of the sclerosing agent, which is determined by the efficacy of the agent, its cost, accessibility, safety, ease of administration and the number of administrations needed to achieve a complete response.[5]

Multiple agents were tried in the past for pleurodesis like talc slurry, Bleomycin, tetracyclins, 5 flurouracil. Talc had the best of results among them but there was issue with its cost and some doubts about its carcinogenicity. Contrary to this, tetracycline i.e. Doxycycline were cheaper but the efficacies were of question especially in cases of 5 flurouracil and bleomycin. So there was a need for an agent, which is safer, easily available, cheaper and efficacious for the purpose of pleurodesis, that's why this study was planned to check it with doxycycline.[6-7]

Objective

To determine the efficacy of pleurodesis done with doxycycline in cases of malignant pleural effusion.

METHODOLOGY

Study Design; Descriptive cases series**.**
Setting; Department of Pulmonology, Sheikh Zayed Medical College / Hospital, Rahim Yar Khan.
Duration; February 2016 to February 2017.

Sample size. Fifty cases of malignant pleural effusion.

Sampling technique; Non probability convenience sampling.

Inclusion criteria;

1. Both genders
2. Age 15 to 70 years
3. Documented cases of malignant pleural effusion.

Exclusion criteria;

1. Cases with co morbid condition like DM
2. Cases of end stage renal, liver or cardiac disease
3. Cases with non expanded lung

Data collection procedure:

This was a descriptive case series and it was done in Pulmonology Department of Sheikh Zayed Medical College / Hospital, Rahim Yar Khan from February 2016 to February 2017. In this study, 50 patients of both genders with age range between 15 to 70 years diagnosed with malignant pleural effusion (by fluid analysis) with primary from lung or any other metastasis were enrolled. The fluid was drained by 28 F intercostal chest drain (ICT). The cases with drain output less than 100 ml per 24 hour and no collection on USG chest underwent pleurodesis using 10 Doxycycline capsules powder mixed with 50 ml of normal saline and injected intrapleurally. The tube was clamped for 2 hours and then re opened and negative suction applied for 24 hours. The cases were then followed on next day and after one week and then one month by USG and CXR PA view. The failure of recollection of fluid more than 100 ml assessed on USG was labeled with positive efficacy.

RESULTS

In the present study, there were 50 cases of malignant pleural effusion (MPE) out of which 34 (68%) were females and 16 (32%) males, with mean age of 36.18± 10.16 years. There were 22 (44%) cases with breast malignancy, 8 (16%) with lung malignancy, 6 (12%) having ovarian malignancy. Out of 50 cases, 30 (60%) cases had effusion more than 1 liter at presentation. The efficacy was seen in 26 (52%) of cases (figure 1). It was better in males where it was seen in 10 (62.50%) of cases as compared to 16 (47.06%) females in their respective groups with p= 0.32. This was better in age group 15 to 40 years where it was seen in 60% of cases as compared to 40% in age group more than 40 with p= 0.08 as in table 1. There was significant better efficacy (p= 0.002) in cases that had pleural effusion less than 1 liter at presentation (table 2).

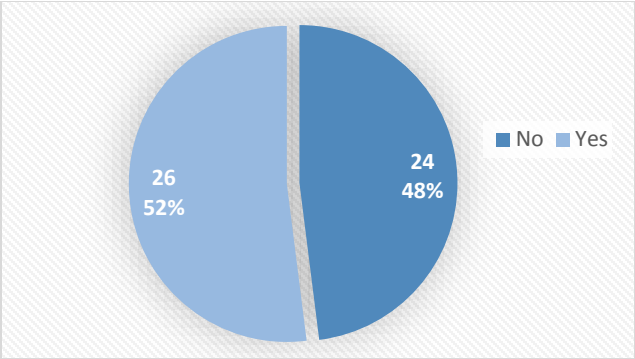

Figure 1: Efficacy of doxycycline for pleurodesis in MPE (n=50)

Table 1: Efficacy with respect to demographics (n= 50)

Gender	Efficacy		Total	Significance
	Yes	No		
Male	10 (62.50%)	6 (37.50%)	16	p= 0.32
Female	16 (47.06%)	18 (62.94%)	34	
Age groups	**Efficacy** **Yes**	**No**	**Total**	**Significance**
15-40	**6** (60%)	**4** (40%)	**10**	**p= 0.08**
>40	**16** (40%)	**24** (60%)	**40**	

Table 2: Efficacy with respect to amount of pleural effusion (n= 50)

Amount of pleural effusion	Efficacy		Total
	Yes	No	
> 1 liter	10 (33.33%)	20 (66.67%)	30 (60%)
< 1 liter	16 (80%)	4 (20%)	20 (40%)
Total	**26 (52%)**	**24 (48%)**	**50 (100%)**

p= 0.002

DISCUSSION

Malignant pleural effusions are hard to cope with as they have the tendency to recur again and again and also there are thought to be the predictor of failure for pleurodesis procedures. They add further to the overall morbidity of the underlying malignancies. There is always a need for better, easily available and cheap agent for pleurodesis. Talc is thought to be highly efficacious but is very expensive considering the socioeconomic status of the study place.

In the present study the efficacy was seen in 26 (52%) of the cases with MPE. This was similar to few studies done in the past. In a study done by Porcel on 34 MPE cases and it was seen that the efficacy was seen in 55% of the cases.[8] But they used half of

the dose as was used in our study. While in another study done by Costa et al, the efficacy was also near to our study with success rate around 60%.[9]

However, few studies have shown better results than this, as in a study done by Mohammed KH et al, the efficacy with doxycycline was seen in 72.7% of the cases.[10] They used the similar procedure and the follow up period like our study. the study by Heffner et al also had efficacy around 78%.[11] The reason of our efficacy less than the previous ones can be explained by the fact that the cases in present study had much advance disease than the comparative ones.

There was significant better efficacy (p= 0.002) in cases that had pleural effusion less than 1 liter at presentation. This was also note by the studies done in the past.[12-13] But they did not use the same cut off values. The reason of higher degree of failure rate in cases with pleural effusion more than 1 liter can be explained by the fact that these cases had rapid re accumulation and hence led to widening of the pleural spaces and also the dilution of the sclerosing agent and hence the lower success rate.

CONCLUSION

Doxycycline is easily available sclerosing agent with successful pleurodesis in half of the cases with MPE. Its failure rate is significantly higher in case that had pleural effusion more than 1 liter at presentation.

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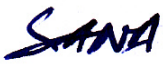
Dr. Sana Sehar Medical Officer / PGR Sheikh Zayad Hospital, Rahim Yar Khan	Data collection	
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