



A DESCRIPTIVE STUDY ON THE EFFICACY OF DOXYCYCLINE FOR PLEURODESIS IN MALIGNANT PLEURAL EFFUSIONS

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ABSTRACT

Objective: To determine the efficacy of Doxycycline for pleurodesis in cases of malignant pleural effusions.

Material and Methods: The design of this study was descriptive case series. This study was conducted at Allied Hospital Faisalabad and the duration of this study was from May 2022 to November 2022. In this study the diagnosed cases of malignant pleural effusion, irrespective of its type and metastasis in adult age range were included of both genders. The pleural effusion was effectively drained with appropriate chest drain. After complete drainage assessed by X ray chest PA view, 10 capsules of Doxycycline (100 mg) were diluted in 50 ml normal saline and were injected through chest drain and clamped for 24 hours. Paracetamol was given as analgesia. The drain was re opened after 24 hours and were followed by X ray chest to label for any fluid presence. Efficacy was labelled as yes where there was no fluid on x ray and drain output was less than 50 ml.

Results: In this study, there were total 50 cases of malignant pleural effusion of any type. Out of these 32 (64%) were females and 18 (36%) males. The mean age was 52.39±9.13 years. Regarding different types of CA, the most common was CA breast comprising 30 (60%) of the cases followed by lung cancer seen in 15 (30%) of cases. The efficacy of Doxycycline for pleurodesis was observed in 28 (56%) of cases. The efficacy was observed in 16 (72.73%) cases with effusion less than 1 liter with $p=0.01$. There was no significant difference in terms of duration of pleural effusion where it was seen in 55% of cases with effusion more than 1 month and 60% of cases with duration less than this with $p=0.83$.

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Conclusion: Doxycycline has shown its efficacy for pleurodesis in almost half of the cases.

KEYWORDS: Doxycycline, Pleurodesis, Malignant Pleural Effusion, Saline, Epidemiological, Transudative, Exudative

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INTRODUCTION

Pleural effusions are one of the salient entities for indoor admissions, indoor departmental calls and short time admissions for minor procedures in the pulmonology and medical departments. It can be described by the free fluid accumulation in the pleural cavity. Its incidence varies globally as well as nationally depending upon the underlying causes and the epidemiological factors.¹⁻² The clinical features are diverse and include generalized weakness, fever, chest pain, heaviness, shortness of breath on exertion etc. depending upon the underlying cause, its rapidity of accumulation and the volume of fluid contained in the pleural cavity. The underlying causes are broadly classified on the basis of transudative and exudative types on fluid analysis.³⁻⁴

Malignant pleural effusions (MPE) are well reported and pose a great diagnostic as well as therapeutic challenge as the mechanisms are complex and the availability of the treating agents is limited and availability and affordability is another concern. The primary goal in such cases is to drain all the fluid and then to create an iatrogenic inflammatory process in the pleural cavity called as pleurodesis. It can be done by medical or surgical procedures. Medical modalities include doxycycline, Bleomycin, pyodine, talc, 5 fluouracil etc. Talc has revealed the highest success rate and lesser complications but is expensive. Doxycycline is easily available, cheap and has shown optimal efficacy with minimal side effect profile in such cases.⁵⁻⁷

OBJECTIVE:

To determine the efficacy of Doxycycline for pleurodesis in cases of malignant pleural effusions.

METHODOLOGY

The design of this study was descriptive case series. This study was conducted at Allied Hospital Faisalabad and the duration of this study was from May 2022 to November 2022. In this study the diagnosed cases of malignant pleural effusion, irrespective of its type and metastasis in adult age range were included of both genders. The pleural effusion was effectively drained with appropriate chest drain. After complete drainage assessed by X ray chest PA view, 10 capsules of Doxycycline (100 mg) were diluted in 50 ml normal saline and were injected through chest drain and clamped for 24 hours. Paracetamol was given as analgesia. The drain was re opened after 24 hours and were followed by X ray chest to label for any fluid presence. Efficacy was labelled as yes where there was no fluid on x ray and drain output was less than 50 ml. The data was analyzed by SPSS version 23.0. Post stratification chi square test was applied taking p value less than 0.05 as significant.

RESULTS

In this study, there were total 50 diagnosed cases of malignant pleural effusion of any type. Out of these 32 (64%) were females and 18 (36%) males. The mean age was 52.39±9.13 years. Regarding different types of CA, the most common was CA breast comprising 30 (60%) of the cases followed by lung cancer seen in 15 (30%) of cases. The efficacy of Doxycycline for pleurodesis was observed in 28 (56%) of cases. The efficacy was observed in 16 (72.73%) cases with effusion less than 1 liter with p= 0.01 as in table 01. There was no significant difference in terms of duration of pleural effusion where it was seen in 55% of cases with effusion more than 1 month and 60% of cases with duration less than this with p= 0.83 (table 2).

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Table No. 1. Efficacy With Respect to Amount of Pleural Effusion

Amount of effusion	Efficacy		Total	p value
	Yes	No		



> 1 liter	10 (35.71%)	18 (64.39%)	28	0.01
< 1 liter	16 (72.73%)	6 (27.27%)	22	
Total	28 (56%)	22 (44%)	50 (100%)	

Table No. 2. Efficacy With Respect to Duration of Pleural Effusion

Duration of effusion	Efficacy		Total	p value
	Yes	No		
> 1 months	22 (55%)	18 (45%)	40	0.83
< 1 months	06 (60%)	3 (40%)	10	
Total	28 (56%)	22 (44%)	50 (100%)	

DISCUSSION

The primary goal of the cases having pleural effusion is to tap it for diagnostic purpose and if the malignancy is established then, the ultimate desire is to drain all the fluid and avoid re accumulation of this as it can not only compress the underlying healthy lung; or it has the tendency to organize and also serve as nidus for the superadded infection. Hence, effective drainage and followed by sealing of this space with effective drug with good efficacy and minimum side effect profile is the the concern. In the present study, the efficacy of Doxycycline for pleurodesis was observed in 28 (56%) of cases in malignant pleural effusion. The findings of the present study have almost similar results to the previous studies conducted on same agent, Porcel et al conducted a study in cases of malignant effusion and they observed that this efficacy was seen in 55% of the cases in their study in 34 cases.⁸ In another study by Costa et al this efficacy was observed in 60% of the cases pleurodesised by Doxycycline.⁹

As compared to the efficacy of 56% in the present study, the other studies carried out at different regions by Mohammed KH et al and Heffer et al revealed higher degree of efficacy showing in the 72.7%¹⁰ to 78%¹¹ of the cases respectively. This can be explained by the

difference in the inclusion criteria or different degrees of severity of the disease in such cases. The efficacy was observed in 16 (72.73%) cases with effusion less than 1 liter with p= 0.01. in the past no such cut off lines were used; however, the studies revealed that the subjects that had a higher degree of mean pleural effusion at presentation, they had higher chances of failure rate for pleurodesis.¹²⁻¹³ This can be multifactorial; as the lesser the effusion and easy was the drainage. Secondly large pleural effusion revealed that there is rapid re accumulation of fluid; hence interfering the inflammatory process, which needs relatively dry pleural surface and appropriate approximation of the pleura.

CONCLUSION

Doxycycline has shown its efficacy for pleurodesis in almost half of the cases.

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