ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 02 | February - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

OUTCOME OF CHEMICAL PLEURODESIS IN PATIENTS WITH RECURRENT PLEURAL EFFUSION COMING TO TERTIARY HEALTH CARE CENTRE

Respiratory Medicine

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ABSTRACT

Chemical Pleurodesis is an accepted therapy for patient with recurrent pleural effusions andrecurrent pneumothorax. Pleurodesis aims to provoke an inflammatoryprocess within the visceral and parietal pleura that will fibrose and adhere both pleural layers together and thus preventing reaccumulation of pleural fluid(1). There are wide variety of agents available for pleurodesis such as iodo-povidone, talc (insufflations or slurry),tetracycline derivatives(doxycycline and tetracycline), bleomycin nitrogen mustard, silver nitrates,dry killed Corney Bacterium Parvum and OK-432(1). This study was conducted to compare the efficacy,safety and outcome between talc powder pleurodesis and betadine pleurodesis through a chest drain as a palliative treatment of recurrent malignant pleural effusion. Aim of the study was to document the clinical outcome of the patients with recurrent pleural effusion treated with pleurodesis using betadine and talc. We conducted a hospital based longitudinal prospective study of 60 patients coming to tertiary health care Centre, Surat with already a diagnosed case of recurrent pleural effusion.Most common etiology was found in recurrent pleural effusions was malignancy. And out of 60 patients,40% of patients had success with betadine pleurodesis and rest 60% success rate with talc pleurodesis. The most common post- pleurodesis complication was fever (25%) followed by chest pain (23-33%). The mean duration of hospital stay was 3 to 6 days with betadine pleurodesis,while 3 to 4 days with talc pleurodesis. Talc is highly effective in controlling recurrent pleural effusions than betadine with less post procedural complications with less hospital stay(2).

KEYWORDS

Chemical pleurodesis, talc, betadine

INTRODUCTION

Chemical Pleurodesis is an accepted theory for patients with recurrent pleural effusions and pneumothorax. Previous study demonstrated that amongst malignant pleural effusion, lung cancers, metastatic breast cancer, lymphomas and Kaposi sarcoma are responsible for 75% of these effusions(3)(4). Majority of these recur after simple thoracocentesis within 5 to 7 days. Repeated thoracocentesis in these cases are not recommended as this process can increase the risk of metastatic spread at the site of puncture, empyema and loss of protein. The resulting protein depletion leads to decrease in oncotic pressure and consequent new accumulation of fluid in the pleural space(5). In this situation patients presented with shortness of breath that interfere with the quality of life. Placement of pleural drainage tube followed by chemical pleurodesis is the preferred approach for this recurrent pleural effusion(6). With chest tube drainage and in those with prolonged survival pleurodesis appears to be the most cost effective treatment(7).

Pleurodesis aims to provoke an inflammatory process within the visceral and parietal pleura that will fibrose and adhere both pleural layers together thereby preventing reaccumulation of pleural fluid. Recurrent effusions are defined by reappearance of pleural fluid within first week after first thoracocentesis(3).

Over the past several years chemical pleurodesis has evolved as the most widely used accepted treatment method for recurrent pleural effusion(8). There are wide variety of agents such a povidone iodine, tetracycline derivatives (doxycycline or minocycline), talc (insufflation or slurry), bleomycin, nitrogenmustard, silver nitrates, dry killed Corynebacterium parvum and OK-432(6).

AIMS AND OBJECTIVES:

- To document the clinical outcomes of the patients with recurrent pleural effusion treated with pleurodesis using betadine and talc.

MATERIALS AND METHODS

We conducted a hospital based longitudinal study of 60 patients with recurrent pleural effusions admitted in the tertiary health care Centre, Surat over a period of 8 months. Convenient sampling method which is a type of non-probability sampling was used and participants were conveniently recruited into the study as per the inclusion and exclusion criteria. A pretested standardized semi structured questionnaire was used which included socio-demographic details, clinical history, clinical sign & symptoms , diagnostic modalities , pleural fluid investigations, blood panel chemistry and follow up details. Study was approved by human research ethics committee of government medical college, Surat. All procedure was done under aseptic precautions by first administration of local anaesthetic agent Lidocaine (3mg/kg ; maximum 250mg) then insertion of appropriate size of intercostal drainage tube. Pleurodesis was done by standard dose of betadine (100 ml of 2% betadine) or talc (4-5 gm of talc in 50ml 0.9% NaCl).Patient was placed in different positions and ICD was kept clamped for 4 hours. Patient was observed for 48 to 72 hours for any reaction or side effects following procedure and no any anti-inflammatory drugs given.ICD tube removal was done when minimal 50ml of fluid drainage was there and bronchopleural fistula was absent. Study Participants were included in study only after written informed consent was obtained from them.

RESULTS

Out of 60 patients admitted and taken in our study,46(77%) were males,while 14(33%) were females. The mean age was 56.4+-12.3 years,ranges from 44 years to 68 years. The maximum incidence of recurrent pleural effusion in this study was among the age group 61 to 70 years.In this study,most patients have history of smokingaddiction (66.66%). Pleurodesis was found to be successful in 40 patients (67%)and was failed in 16 patients (27%) out of 60patients and 4 patients died before final outcome due to underlying disease. Out of 40 patients with successful pleurodesis 16 (40%) patients had Betadine pleurodesis and 24 (60%) patients had Talc pleurodesis.Out of 16 patients with failed pleurodesis 11 (68.8%) patients had Betadine pleurodesis and 5 (31.2%) patients had Talc pleurodesis. The most common post pleurodesis procedure complication was fever (25%) followed by chest pain(23.33%) and hypotension (5%). The mean duration of hospital stay was 3-6 days with betadine pleurodesis while 3-4 days with talc pleurodesis.

Table 1: SEX DISTRIBUTION

SEX	NO. OF PATIENTS	PERCENTAGE (%)
MALE	46	76.66
FEMALE	14	23.33
TOTAL	60	100

Table 2: AGE DISTRIBUTION

AGE GROUP	NO.OF PATIENT	PERCENTAGE (%)
18-30	2	3.33
31-40	5	8.33
41-50	13	21.66
51-60	15	25
61-70	22	36.66
71-80	2	3.33
81-90	1	1.66
TOTAL	60	99.97

Table 3: RISK FACTORS DISTRIBUTION IN SEX

RISK FACTOR	MALE	FEMALE
PAST H/O TB	16	5
SMOKING	40	0
CHULA EXPOSURE	0	14
ALCOHOL	20	2
FAMILY H/O	06	04

Table 4:OUTCOME OF PLURODESIS IN RECURRENT PLEURAL EFFUSION:

OUTCOME	NO.OF PATIENTS	PERCENTAGE
SUCCESS	40	67%
FAILURE	16	26.66%
DIED	04	6.66%
TOTAL	60	100%

Table 5:OUTCOME OF PLEURODESIS WITH TWO DIFFERENT AGENTS

OUTCOME	BETADINE	TALC
SUCCESS	16(40%)	24(60%)
FAILURE	11(68.75%)	05(31.25%)
DIED	03(75%)	01(25%)

Table 6 :COMPLICATIONS INDIVIDUALS WITH BETADINE AND TALC.

COMPLICATIONS	BETADINE	TALC
NONE	06	22
CHEST PAIN	11	03
FEVER	11	04
HYPOTENSION	04	00
ARDS	00	00
BREATHLESSNESS	05	01

Table 7 : HOSPITAL STAY VS AGENT USED.

DAYS	BETADINE	TALC	TOTAL
3	3	17	20
4	17	13	30
5	08	00	08
6	02	00	02
	30	30	60

DISCUSSION

This study included 60 patients with recurrent pleural effusions due to etiologies like lung cancer, breast cancer, Rheumatoid arthritis, Systemic lupus erythmatous, tuberculosis and ovarian carcinoma in which 30 patients were subjected for betadine pleurodesis and other 30 to talc pleurodesis. In a one clinical trial **Islam M Ibrahim(9)**, randomized non blinded controlled trial, 39 patients were subjected for pleurodesis with betadine and talc having etiology like lung carcinoma, breast carcinoma and unknown primary in which 21 patients were subjected for betadine pleurodesis and 18 patients were subjected for talc pleurodesis.

In our study, there were 46 males (76.66%) and 14 females (23.33%).Our study patients were ranging from 44 years to 68 years. Mean +_SD was 56.4 +_12.3 years.The maximum incidence of recurrence pleural effusions in this study is between 61 to 70 years. In one clinical trial, **Islam M Ibrahim(9)** randomized non blinded controlled trial two groups were taken from 39 patients of recurrent pleural effusions.There were 11 males (28.2%) and 28 females (77.8%). In this study there is no statistical difference between both groups regarding sex. Patients' age were ranged from 65 to 80 years with mean +_SD is 71.0 +_5.0.

The most common symptom in our study was coughing (60% of cases), followed by breathlessness which occurred in 41.66% of patients and chest pain found in 40 % of patients.In **Islam M Ibrahim(9)** randomized non blinded controlled trial the most common symptom was dyspnea 35 (89%) followed by cough which occurred in 15 (39%) cases and chest pain that occurred in 19(49%) cases with no statically significant difference between both groups.

Positive response to treatment was found in 40 patients out of 60 (67%) while failure was found in 20 patients (23%) of patients.Out of 40 patients,16 patients (40%) were subjected to pleurodesis with betadine while rest 24 patients (60%) were subjected to pleurodesis with talc. Patients who had undergone betadine pleurodesis, 14 (70%) out of 20 failed pleurodesis while in patients who had undergone talc pleurodesis, only 6(30%) had failed response. The study was statistically significant with having p value of 0.02.In a clinical trial,**Islam M Ibrahim(9)** out of 39 patients of recurrent pleural effusions, Talc pleurodesis was found to be successful in 15 patients (71.4%) and failure was found in 4 patients (28.6%).While Betadine pleurodesis wasfound successfulin 12 (63%) patients and failure was found in 6 (37%) patients with no statistically significant difference between two groups. In a prospective randomized study,**Agarwal R and colleagues(10)** randomly assigned patients with pleural effusions and pneumothorax to receive chemical pleurodesis with either betadine or talc.They studied 38 patients with pleural effusions who required pleurodesis. They observed success in 16/19(84.2%) in iodo-povidine group and 15/19(78.9%) patients in talc groups.

Further in the context of comparison of side effects, in our study, Fever (25%patients) and Chest pain(24%patients)were the common adverse effects fever being the most common complication. Out of 14 patients having chest pain 11 patients were from betadine (iodol povidone) pleurodesis and 3 were from talc pleurodesis.Out of 15 patients having fever 11 patients were having pleurodesis by betadine,while 4 patients were having pleurodesis with talc.There were 4 cases of mortality were found,the cause of death related to the primary tumor not due to pleurodesis. In a trial, **IslamM Ibrahim(9)**,chest pain and fever were the most common complications. Chest pain was recorded in 14 (35%) patients of betadine pleurodesis and 9 (23%) patients of talc pleurodesis.In **Agarwal R and colleagues(10)**study, 2006, ALL patients experienced chestpain. Fever occurred in 9(24%) patients, which was self-limited. Two patients developed empyema one with iodo povidone and one with talc,which was treated by antibiotics. There was statistically significant difference between two groups as regards the complications compared to **Apichart and Poonkasen 2001** chest pain was noted in 2 cases of their 12 patients (17%) in comparison to (%) in our study, also 7 cases out of their 12 patients (58%) developed fever after Iodopovidone pleurodesis compared to 11 cases developed fever after iodo-povidone pleurodesis. 6 cases of their patients loculation of pleural fluid**. Webb and Colleagues(11)** who reported 100 % success rate in 28 patients with no significant complications**. Kennedy and colleagues(12)** have shown talc slurry to be very effective agent, there were no such problems with severe chest pain or prolonged pyrexia in any of the patient.

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