ORIGINAL ARTICLE

Outcome of Tuberculous Pericardial Effusion treated through "DOTS" Strategy

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ABSTRACT

Background: Tuberculosis (TB) is a multi system disease and it involves many organs including heart.

Method and Material: The aim of this descriptive study was to determine treatment outcome of patients with pericardial effusion, presented to Cardiology and Pulmonology Units KTH from February 2004 to December 2006, who were treated according to the WHO guidelines with implementation of DOTS strategy.

Results: Out of 67 patients, 36(54%) were male and 31(46%) were female with the mean age of 34 Years (age range: 17-63 Years). Fifty five (82%) patients were in age range of 10-40 years and 9 (13%) had a TB contact in the past. All 67 patients were started on Anti Tuberculous Treatment (ATT) according to the WHO guidelines and oral steroids were added in tapering dosage. All the patients were followed for 8 months with regular monthly follow up. Fifty four (82%) patients had completed the treatment, 3(4.4%) patients died, 7 (10.4%) patients were lost to follow up and 3 patients had developed constrictive pericarditis and were referred to Cardiothoracic Surgeon.

Conclusion: Outcome of tuberculous pericardial effusion treated through DOTS Strategy is practical and the way forward.

Key words: "DOTS" Strategy, Tuberculous Pericardial effusion, Tuberculous Pleuro-Pericardial effusion, Treatment outcome.

INTRODUCTION:

Tuberculosis (T.B) remains a serious challenge for developing countries like Pakistan[1]. It is leading cause of death from any single infectious agent worldwide. Each year more than 2 million people die from TB and 95 % of these cases occur in developing countries[2].

Pakistan stands at number 8 in the list of 22 high burden TB countries of the world with a population of 144 million an estimated 300,000 people get TB every year in Pakistan[1, 2], out of these people three quarters of them are in young age group[1,2,3].

Major problems encountered in Pakistan regarding TB are late or improper diagnosis, prescription of inadequate treatment regimen, poor supervision leading to irregular intake of drugs and poor follow up[1, 4].

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In 1994, the government of Pakistan adopted the Direct Observation Treatment short course (DOTS) strategy. Until 1999 population coverage of DOTS in Pakistan was only 8%[3] but by 2005 it was extended to most of the Districts of Pakistan.
Tuberculosis is a multiple system disease and it involves many organs including heart[5, 6] leading to pericardial effusion. Incomplete treatment causes increase morbidity and mortality[7] and hence treatment outcome can be served as a tool to control the quality of TB treatment even in tuberculosis pericardial effusion patient[6, 8].
In our setup, Chest TB clinic, works with Provincial TB control program (PTP) and provides free Anti TB treatment to all the registered patients.
This baseline study was conducted to determine treatment outcome of patients with tuberculous pericardial effusion, treated in Khyber Teaching Hospital through DOTS strategy.

MATERIALS & METHODS:
This descriptive study was conducted in collaboration with Cardiology & Pulmonology unit, outpatient TB clinic at Khyber teaching hospital, Peshawar from February 2004 to December 2006.

Convenience sampling technique was employed and diagnosed patients of tuberculous pleuro-pericardial or pericardial effusion were included in the study after informed consent.
Patient with co-morbid condition like chronic renal failure, chronic liver disease, Effuso-constrictive pericardial effusion on Echocardiography, COPD and congestive Cardiac failure were excluded from the study.
Diagnosis of pericardial effusion was established on Chest x-ray and 2-D echocardiography and tuberculosis was established on the histological or microbiological evidence from sputum AFB, pleural/pericardial fluid cytology, biochemistry, microbiology (ZN Stain) & fluid culture and sensitivity or pleural biopsies[1,2,6,8,9,10] where needed.
Clinical diagnosis of tuberculosis was made where there was positive history of TB contact, Chest X ray findings of TB parenchymal disease and or negative work up for other causes of pericardial effusion[11].
Anti TB treatment started in accordance with WHO guidelines[1, 2] along with steroids (0.5mg to 1mg/kg body weight) in tapering doses for six weeks. Under DOTS strategy[12-15], patients were regularly followed up at TB clinic plus Cardiology OPD, with repeat echocardiography where required. Patients were assessed by Chest x-ray and Echocardiography and main outcome was recorded in the form of number of patients cured, treatment completed, lost to follow-up, constrictive pericarditis and died[1]using the following definitions:

(a) Patients were labeled as cured, when Sputum Smear positive (SS +ve) patients complete treatment and had Sputum Smear negative(SS -ve) results on at least 2 occasion,1 of which at the end of treatment with CXR &/ Echocardiograph showing no evidence of pericardial effusion.
(b)Treatment completed were:
(1)SS+ve patients who completed treatment with SS-ve at the end of initial phase, but no /1SS-ve in continuation phase and none at end of treatment with no evidence of pericardial effusion at the end of treatment on CXR &/ echocardiograph.
(2)Sputum Smear –ve patient who received full course of treatment and CXR &/ Echocardiograph showing no evidence of pericardial effusion.
(c)Lost to follow-up or Defaulted were patients who after registration has not collected drugs >2months but become SS-ve before they stopped treatment.
(d) Patient died during treatment regardless of cause were reported as died.
(e) Constrictive pericarditis diagnosed on follow-up echo at 2months and/ end of treatment (8 months).

Demographic data, relevant medical history and necessary investigation, along with starting of Anti TB , treatment data, follow up visit and complications were recorded in a structured Performa.

Data entry and record keeping was done by trained staff and data was entered in SPSS version 12.

RESULTS:

In our Study out of 67 patients 36 (54%) were men & 31 (46%) were women, with mean age of 34 Years (age range: 17-63 Years). Age & sex stratification is highlighted in (Fig 1). Eighty (80%) percent of study population were from productive age group >10-40 years.

As this study was conducted in Khyber Teaching Hospital Peshawar, a tertiary care hospital, patients were referred from all over NWFP and Afghanistan, hence out of 67 Patients 30 (45%) were Afghan refugees either residing in Peshawar or referred from Afghanistan whereas 37 (55%) were local Pakistani patients from different areas of NWFP. (Table I).

Clinical presentation is outlined in (Fig 2),46 patients had pleuro-pericardial effusion, whereas 21 patients presented with pericardial effusion.

Out of 67 Patients,48 (72%) have got confirmed TB (Table ll) among these 48 patients, TB was confirmed via Pleural biopsy in 26(38.8%), Sputum Smear AFB positivity in 11(16.4%) cases, fluid (Plural/Pericardial) AFB Positivity in 4(5.9%) patients and positive fluid Culture -Sensitivity report in 7(10.44%)patients.
Clinical diagnosis of tuberculosis was made in 19 (28%) of study population on the basis of positive history of TB contact, CXR findings of TB parenchymal disease,2(3%)

patients with negative workup for other causes of pericardial effusion i.e. uraemia, connective tissue disease, post myocardial infarction. (Table ll)

AGE and SEX Stratification

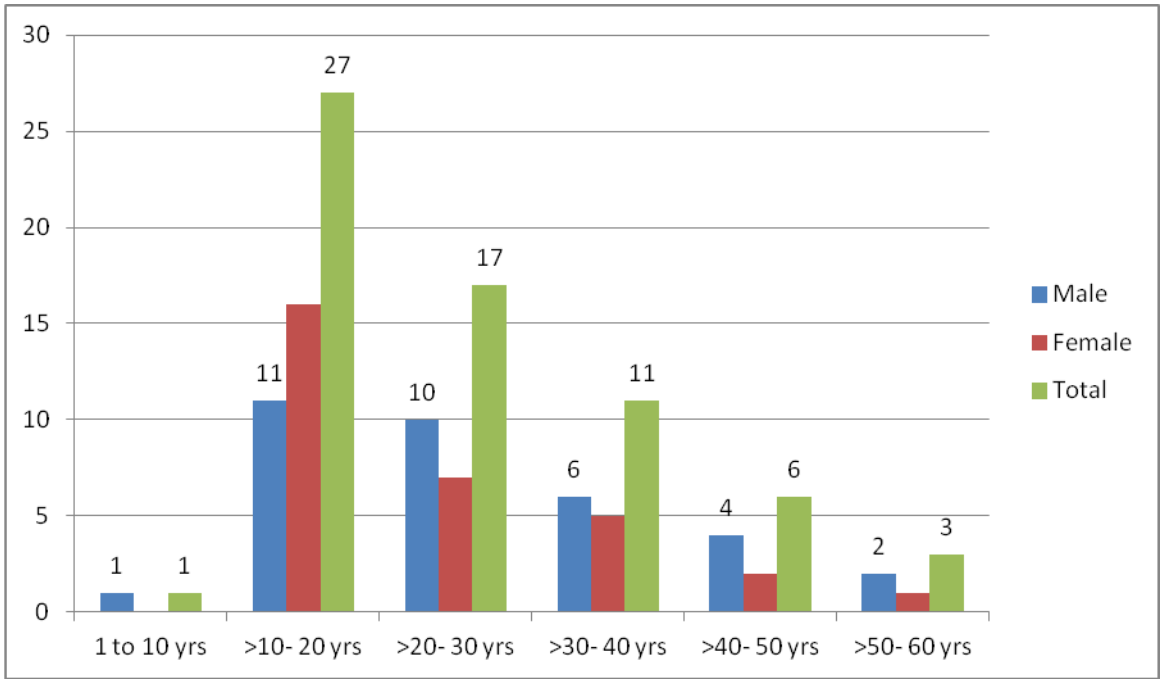

Figure 1

Geographic and gender distribution

Geographic distribution	**Male N=36**	**Female N=31**	**Total N=67**
Afghan Refugees	16	14	30(45%)
Pakistani	20	17	37(55%)

Table l

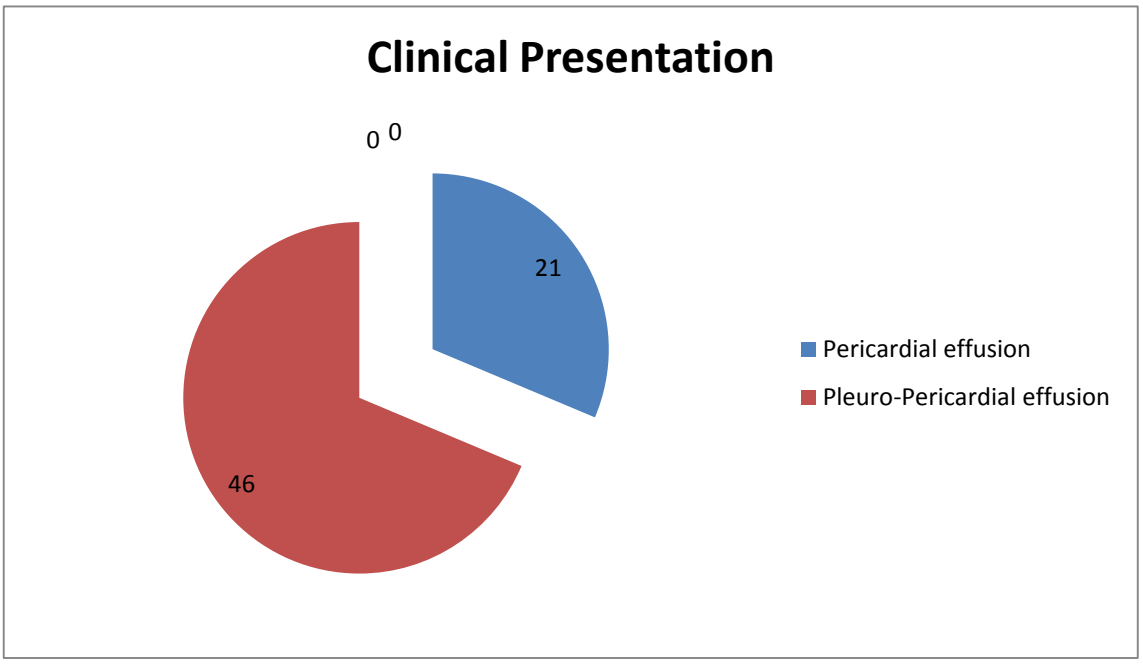

Figure II

All 67 patients were regularly followed at fortnight interval and provided free medication from PTB program at Chest & TB Clinic. Out of 67 patients, 54 patients (80%) has completed treatment, whereas 11% i.e. 7 patients lost to follow up, 3 (4.4%) patients died. Pericardial effusion was assessed on CXR and/ Echocardiography, eighty percent patients pericardial effusion were resolved on follow-up echo at 2 months and only 3 Patients developed Constrictive Pericarditis & were referred to Cardiac Surgery for Surgical intervention.(Fig 4).Out of these 3 patients, two lost follow-up and one died.

Table II

Investigation	Pericardial n=21	Pleuro-Pericardial N=46	Total N=67
A : Confirmed Diagnosis	6	42	48 (72%)
I. Sputum Smear positive	2	9	11
II. Pleural Biopsy	-	26	26
III. Pleural fluid AFB	-	3	3
IV. Pericardial Fluid AFB	1	-	1
V. Pleural Fluid Culture and Sensitivity	-	4	4
VI. Pericardial Fluid Culture and Sensitivity	3	-	3
B : Clinical Diagnosis	15	4	19(28%)
I. Positive History of TB contact	8	3	11
II. Chest X-ray positive findings	5	1	6
III. Negative workup for other diseases	2	0	2

Outcome of ATT under DOTS Strategy

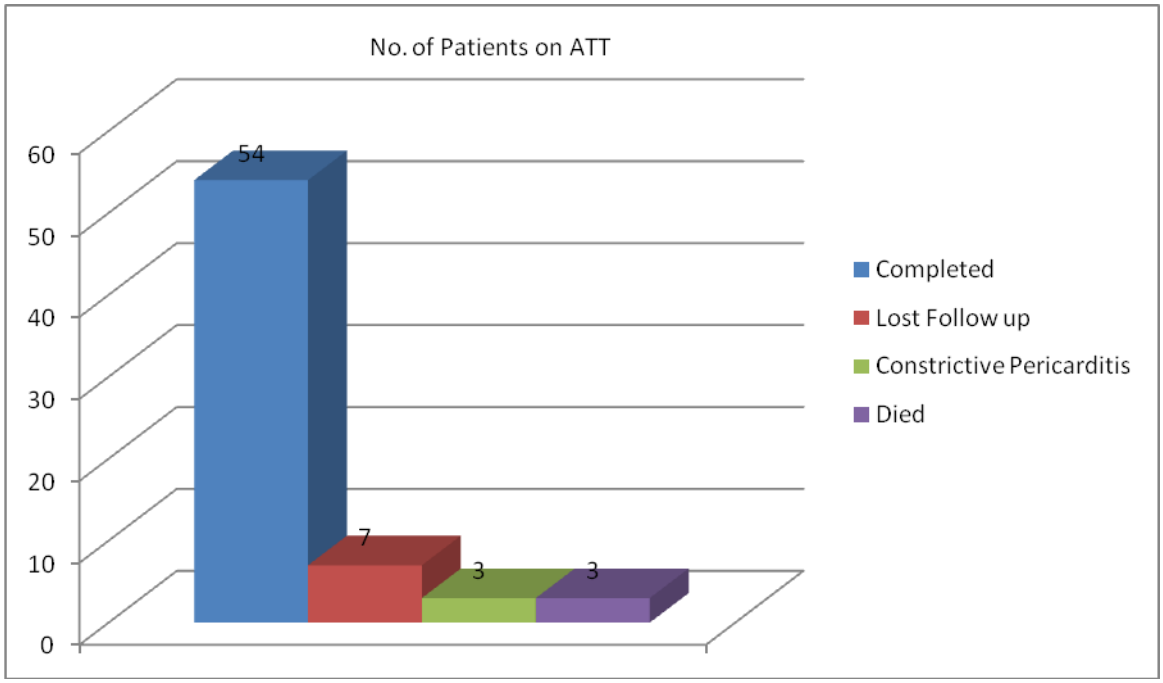

Figure III

DISSCUSSION:

The prevalence of Tuberculosis has been on rise throughout the world, especially in developing countries as we know it is a disease of poverty prolonged ill health and leading cause of death from any single infectious agent worldwide[1,2]. The WHO estimated 3 million new cases and 60,000 deaths each year, with rising incidence of extrapulmonary TB[2,6,7,16]. The Tuberculous Pericardial disease is a potentially curable cause of heart disease that accounts for about 10% of all patients hospitalized for cardiac failure in sub-Saharan Africa [17,18]. The WHO "DOTS" strategy for TB management was introduced in year 2000, main focus was to recommend DOTS strategy to all public sector hospitals[2], in order to achieve targeted cure rate and reduced default rate with better outcome[11,14].

In this study (36)54% of patients were male and (31)46% were female, our this study finding is similar with other national and international studies[19,20,21]. Study conducted by Uplekar et al reports 70% worldwide excess of male population over female tuberculosis cases, reason may be either men are socially more active and visit public places more often[22] or delay[21] and low notification rate of tuberculosis among female could be one reason for less number of tuberculosis in women[23].

Nineteen patients (28%) with clinical diagnosis of TB were also treated and an adequate response to empirical ATT was highly suggestive of tuberculous pericarditis. Although the role of empirical treatment in non-endemic area is not recommended[18].

In our study ATT was administered along with steroids and patients showed dramatic response in symptomatic improvement. In one large scale prospective South African study oral steroids appeared to decrease the risk of re-accumulation of pericardial fluid, and reduced trend towards mortality[17,18,19]. Furthermore, the use of steroids in confirmed pericardial constriction was associated with low mortality and reduced requirement for pericardectomy[19,24,25,26].Although the steroids use remained controversial but in our practice adjuvant steroids is being used in patients with TB pericarditis .

The treatment completion rate is 80% which is low as compare to other studies[11,12,25]and WHO target of 85%[2,14], whereas 11% default rate is high. This high rate may be explained by undefined catchment population, seeking advice from private practitioner and lack of implementation of DOTS strategy.

Limitations: It's a single centre experience, hence long term outcomes needs to be explored by multicentre randomized control trails.

Conclusion: Outcome of tuberculous pericardial effusion treated through "DOTS" Strategy is practical and the way forward.

Recommendations: The key message is TB pericardial effusion should also be treated under DOTS strategy in order to prevent serious complications.

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