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Prevalence and causes of delay diagnosis
of advance infectious Pulmonary
Tuberculosis in Kanchanpur District,
F.W. Region Nepal
(1st Shrawan 2060 to 30th Poush 2060)

2005

Principal Investigator

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Mahendranagar

Title : prevalence and causes of delay diagnosis of advanced infectious Pulmonary Tuberculosis in Kanchanpur F.W. Region

Research site : Mahakali zonal Hospital, Kanchanpur Main Treatment center DOTS, DPHO Kanchanpur

District : Kanchanpur

Zone : Mahakali

Region : F.W. Region

Population : Advance infectious new sputum positive Pulmonary Tuberculosis

Gender : Both male/female

Age : All age group

Duration : Six month

(from 1st Shrawan 060 to 30 Poush 2060)

Sample size : One hundred and nine patients.

Methodology : Clinical, Bacteriological and radiological basis with series of constructed questionnaires

Principal Investigator : Dr. Shubhesh Raj Kayastha, DTCD, FCCP, Chest Physician, Mahakali Zonal Hospital

Co-investigators : a) Mr. Gita Ram Rizal, AHW, Mahakali Zonal Hospital

b) Mr. Padam Bahadur Shah, Lab asst. DPHO, Kanchanpur

Introduction

Kanchanpur is extreme far western district of Far western Region of Nepal. The district have a total population of thirty eight thousand four hundred and sixty two with 2.5 percent. Annual Risk of Tuberculosis Infection (ARTI). There is one Zonal Hospital, three Primary Health Complexes, Eight health post and ten sub Health posts. So far DOTS centers is concerned, there are four treatment centers, eighteen treatment sub-center and four microscopic centers in district.

DOTS was implemented in Kanchanpur district since 1995. The cohort study on case finding of district national Tuberculosis programme (NTP) (Table I) showed progressive increase in case finding rate (+70% in every year). A total six hundred twenty nine TB patients wee registered during fiscal year 2052/053 and 776 during F/Y 059/060. Tuberculosis is a leading infectious disease causing significant mortality and morbidity in Nepal. Early diagnosis and early treatment of positive cases is crucial in order to prevent transmission of infection in community. Late attendees of infectious form of pulmonary Tuberculosis patient are frequently seen despite free diagnosis and treatment. The aim of NTP is early diagnosis and early treatment of infectious pulmonary tuberculosis in order to prevent further transmission. But in practice majority of infectious cases seeks medical consultation at late advance stage of TB while patient's pulmonary parenchymal lesions became extensively damage causing irreversible morbidity even after recovery from successful chemotherapy. On the other hand these patients excreates significant amount of tuberculosis bacilli at surrounding infecting the contacts at least 10-15 person/year. These factors create negative impact on NTP to control disease for long period. Therefore considering these facts this research work have focused on infectious patient with advanced pulmonary Tuberculosis and have investigated and analysed the under lying causes of delay arrival of patient at health care setting.

Table : I

A nine year cohort study of case finding in Kanchanpur

F/Y	Smear				Smear Negative	Extra Pulmonary	Total
	New	Relapse	Failure	RAD			
2051/052	259+26	01	0	2	423+99	21+8	707+133=840
2052/053	299	101	1	12	271	36	629
2053/054	309+7	205	5	60	209	29	639
2054/055	364	386	6	41	154	30	633
2055/056	380	4211	11	26	233	69	761
2056/057	340	3413	13	19	222	79	707
2057/058	354	499	9	18	291	39	760
2058/059	315	69	3	21	291	67	803
2059/060	361	68	7	16	242	82	776

Objectives of research

General

To know prevalence of advanced infectious pulmonary Tuberculosis and causes of delay diagnosis of such disease at Mahakali Zonal Hospital, Kanchanpur.

Specific

- To know the prevalence of sputum smear positive patients among all TB patients attending DOTS treatment centre of Mahakali zonal hospital.
- To know prevalence of advanced infectious Pulmonary Tuberculosis patients attending DOTS treatment centre of Mahakali Zonal Hospital.
- To know the causes of delay diagnosis of such advanced infectious pulmonary tuberculosis.

Methodology

Among all TB patients only sputum positive advanced cases of 3 different population categorized either by clinical or bacteriological or radiological basis has been enrolled in study. Only the new sputum smear positive patient were enrolled in research. Retreatment sputum positive patient (Relapse, Return after default, Treatment failure) receiving category II regime has been excluded in this study. The duration of study was six month from 1st Shrawan 2060 to 30th Pausl 2060. The entire research work was carried out main DOTS center Mahakali Zonal Hospital. Sputum smear for AFB was performed for 3 consecutive days by lab. Assistant of DOTS clinic. Grading of positivity was recorded in every report according to number of bacilli as reference to WHO guideline. X-ray chest anteroposterior view was done in every enrolled patient and has been interpreted a moderately advanced and far advanced. All diagnosed advanced infectious PTB has been interviewed by a co-investigator (Auxilliary Health Worker) with prescribed questionnaire. (Sec Annexa I)

Advanced infectious PTB has been defined either on clinical or bacteriological or radiological basis as follow and are considered as inclusion criteria.

- Clinical basis** : Any sputum positive new patient with history of illness more than two months was enrolled in the study.
- Bacteriological basis** : Any sputum smear positive showing 2+ or more positive on following criteria made by WHO has been enrolled. The number of bacilli seen in a smear reflects disease severity and patient infectivity. Therefore the number of bacilli seen in each smear has been recorded. The method of recording was as follow :-

No. of bacilli seen in a smear	Result reported
No AFB per 100 oil immersion field	0
1-9 AFB per 100 oil immersion field	Scanty
10-99 AFB per 100 oil immersion field	(1+)
1-10 AFB per oil immersion field	(2+)

>10 AFB per oil immersion field

(3+)

Ziehl - Neelsen stained was used.

c) **Radiological basis:** All the x-ray chest P/A view of infectious patient has been assessed in order to evaluate extent of TB on radiological basis as minimal, moderately advanced & far advanced. The patient having moderately advanced & far advanced has been included in the study. The extent of lesion has been categorized in reference to national TB Association of USA, diagnostic standard and classification of TB New York as follow.

"Minimal" Minimal lesion include those which are of slight to moderate density but which do not contain demonstrable cavities. They may involve a small part of one or both lungs but the total extent regardless of distribution should not excesses the volume of lungs in one side which is present above second chondrosternal junction and the spine of the fourth or the body of the fifth thoracic vertebra.

"Moderately advance" Moderately advance lesion may be present in one or both lungs but moderate density which may extend throughout the total volume of one lung or equivalent in both lungs, dense and confluent lesion which are limited in extent to one third the volume of lung, total diameter of cavitatum if present must be less then 4cm

"For advanced lesion" Lesion most extensive than moderately advanced.

Results :

This research study was carried out during the fiscal year 060/2061. The research was done on first quarter of fiscal year (i.e. from shrawan to kartik) and first half of second quarter (i.e. from 1st Mansir to 30th Poush) with a total of duration of six month. The total TB patient registered during this 6 month period is shown in case finding cohort study.

Table II

Cohort study on case finding of 1st quarter and first half of second Quarter (i.e. 1st Shrawan 2060 to 30 Paush 2060) Kanchanpur NTP. (CFR = 76%)

New		Total	Sputum positive						Smear Negative		Extra Pulmonary		Total	
			Relapse		Failure		RAD		M	F	M	F	M	F
M	F		M	F	M	F	M	F	M	F	M	F	M	F
129	62	191	25	10	6	2	7	0	89	32	34	21	290	177

EP = Extra pulmonary

RAD = Return after default

M = Male

F = Female

A total 417 Tuberculosis patients were registered during First quarter and first half of second quarter of F/Y 060/061 with case finding Rate (CFR) 76%. among 417 TB patients 191 (79.25 %) comprised new sputum smear positive patients. Retreatment sputum positive patients constitutes 50 (20.74 %). A total sputum smear negative and extra pulmonary Tuberculosis constitute 121 patient and 55 patient respectively. So far the proportion of sputum smear positive with sputum smear negative and extra pulmonary TB is concerned, it was found to be less than 1:1 which represent good case finding.

Among the total 191 new sputum smear positive Pulmonary tuberculosis 109 (57.06%) were diagnosed as advanced infectious Pulmonary Tuberculosis either on clinical or Bacteriological or Radiological basis. During the six month period among Registered 417 Tuberculosis population 109 patient was found to have advanced infectious form of tuberculosis. Out of 109 patient 74 (67.88%) male and 35 (32.11%) patient were female as shown in table III

Table III

No. of advanced infectious TB patient month and gender wise. 1st Shrawan to 30th Poush n = 109

Month year 2060	Total no of patient	Sex	
		Male	Female
Shrawan	32	19	13
Bhadra	17	12	5
Aswin	10	5	5
Kartik	15	13	2
Mansir	17	13	4
Poush	18	12	6
Total	109	74	35
%		67.88%	32.11%

Table IV

Table IV shows age wise distribution of 109 research population and found age gp +50 Yrs was first highest number which comprised 22 (20.18%) second highest was 20-24 Yrs age group which comprised 18 (16.51%) and third highest group was aged 25-29Yrs 13 %

Age wise distribution of research population n = 109

0-4Y	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49	+50
1	0	2	9	18	14	13	6	12	12	22
0.91%	0%	1.83%	8.25%	16.51%	12.84%	11.92%	5.5%	11%	11%	20.18%

Table V

Demographic and clinical characteristics of Research population Table (V,VI,VII,VIII)

Sex		Residence		Knowledge			Associate other disease
M	F	Rural	Urban	About NTP	Route of TB Transmission	Disposal Of SP	
74	35	98	11	2	2	1	27
67.88%	32.11%	89.90%	10.09%	1.83%	1.83%	0.91%	24.77%

Table V, VI, VII and VIII shows demographic and clinical characteristics of Research population.

Table V show prevalence of advance infectious pulmonary Tuberculosis gender wise Out of 109 patient 74 (67.88%) represent male and 35 Comprised (32.11%) female population. Mostly the patient belongs to rural area 98 (89.90%). During the course of interview every patient were assessed about their knowledge on National Tuberculosis program, Route of Transmission of TB and proper way of disposal of expectorated sputum. Only 2 (1.83%) knew about NTP and 2 (1.83%) was able to tell route of transmission and only 1 (0.91%) knew disposal of sputum. Out of 109 enrolled patient 27 (24.77) have got associated diseases as shown in table VI.

Table VI

A total 27 (24.77%) have got associated disease with advance pulmonary Tuberculosis COPD was highest associated disease which comprised 15(13.76%) followed by sever Anemia with haemoglobin less than 5gm% represent 4 (3.66%). All of the anaemic patient received blood during hospital stay. The 3rd ranked disease among TB patient was HIV and Diabetes mellitus when represent 2 (1.83%) and 2 (1.83%) respectively.

Associated disease

Disease	COPD	Anemia <5gm Hb%	HIV(+)	UTI	Polio my elitics	RHD with MS	TBM	DB
No	15	4	2	1	1	1	1	2

4 Anemic patient have received Blood transfusion

COPD = Chronic Obstructive Pulmonary Disease

TBM = TB Meningitis

RHD = Rheumatic Heart Disease

MS = Mitral Stenosis

Table VII

Among 109 patient 97 (88.99%) were married population and 83(76.14%) was literate. A total 14 (12.84%) gave family history of pulmonary Tuberculosis. Among the total enrolled patients 18 advanced Pulmonary Tuberculosis patient were admitted in zonal hospital considering their critical condition.

Marital status		Literacy		Family H/o Pul TB	No. of hospitalized * patient
Married	Unmarried	Literate	Illiterate		
97	12	83	26	14	18
88.99%	11%	76.14%	23.85%	12.84%	78.14%

* One patient died before commencing treatment.

Table VIII

Table VIII shows occupational background of research Population

Agriculture	Business	Student	Service	Driver	Prisoner	Minor	Total
74	12	10	8	3	1	1	109
87.88%	11%	9.17%	7.33%	2.75%	0.91%	0.91%	100%

Majority 74 (87.88%) was found to be engaged in agriculture followed by business which comprised 12 (11%) and third majority population was student which represent 10 (9.17%).

Table IX

A total 109 new sputum smear positive patient has been diagnosed as advance infectious pulmonary Tuberculosis either on clinical or bacteriological or radiological basis as shown in table IX

No. of advanced infectious Pul TB patient on clinical, Bacteriological and radiological Basis n =109

Clinical Basis				Bacteriological Basis			Radiological Basis		
Duration of illness				Grading of SP positivity			Extent of Pulmonary lesion		
0-1m	1-2m	2-3m	>3m	1+	2+	3+	Minimal Lesion	Moderately advanced	far advanced
24	28	19	38	11	54	42	20	62	26
22.01%	25.68%	17.43%	34.86%	10.09%	49.54%	38.53%	18.34%	56.88%	23.85%

m=moth

Sp=sputum

One pregnant mother with Sp Sm 3+ was not x rayed

One died before Sp, Sm examination

One minor boy (6 month) was not included in bacteriological examination

Majority patients 38 (34.86%) diagnosed after a period of three month from onset of illness and 28 (25.68%) during 1 to 2 months of onset of illness. Among total 107 sputum smear for AFB examination majority was found to have 2+ positive for AFB which represent 54 (49.54%) follow by more than 3+positive for AFB population which comprised 42 (38.53%). So far the extent of pulmonary lesion is concerned among the enrolled patient, Radiological assessment was done on 108 cases. The result showed majority patient 62 (57%) have moderately advanced Tuberculosis and 26 (23.85%) patient have far advanced lesion.

Table X

Table X shows reasons of delay arrival in diagnostic centre

Reasons of delay arrival in diagnostic centre n =109

causes	undiagnosed at PHC, HP, SHP	unawareness about disease	private medical shop	Consultation at India with Quack	total
No.	35	56	10	8	109
%	32.11%	51.37%	9.17%	7.33%	100%

PHC = Primary Health centre

HP = Health Post

SHP = Sub Health Post

Among 108 patient, 56 patient (51.37%) was found unaware about disease. The second majority patients 35 (32.11%) attended peripheral health institute (PHC, HP, SHP) but were failed to diagnose the disease and 10 patient (9.17%) were engaged with private medical shop for their treatment .

Discussion :

During the six month period of research work a total 417 TB patient registered in NTP of Kanchanpur district. The new sputum smear positive cases represent 191. Among this new smear positive cases, 109 (57%) represents advanced infectious pulmonary tuberculosis. The data revealed prevalence of advance infectious TB is extremely high. The district have high burden of sputum positive cases than sputum negative pulmonary TB plus extra pulmonary case. Gender wise male and female ration was 2:1 . The most affected age group was 20 year to 34 years, considered as most potential age group of socioeconomic sector. Mostly the enrolled patient belongs to rural population of agriculture background with sever lack of health education. HIV revealed 3rd ranked TB associated disease after COPD and Anemia. Majority patients (34%) seek medical consultation at very late stage even more than 3 month after onset of symptom. Therefore mostly (38%) research population showed high grading of sputum positivity i.e. more than 3+ positive for AFB in their smear. So far the radiological assessment regarding extent of pulmonary lesions is concerned, it revealed that 56% have moderately advanced lesion indicating sever and permanent pulmonary morbidity. Analysis was done to find out the reason of delay arrival at diagnostic centre. It revealed that 51% have sever lack of health education. The second cause of delay arrival was due to lack of clinical orientation on tuberculosis among health care worker 32% were treated for disease other than tuberculosis at different PHC, HP and SHP clinical based orientation of TB is crucial for these health worker. Education of patient and health care worker is an important work to be carried out in order to control TB in Nepal.

Budget Expenditure

(From 1st Shrawan 060 – 30th Posuh 2060)

A) Monthly Embursement

1. Dr. S.R. Kayastha

Principal Investigator Rs. $5000 \times 6 = 30,000$

MZ Hospital

2. Mr. G.R. Rijal

Co-investigator Rs. $3000 \times 6 = 18,000$

AHW, MZ Hospital

3. Mr. P.B. Shah

Lab asst., DPHO Rs. $1000 \times 6 = 6,000$

Kanchanpur

4. Mr. B.K. Suvedi

Peon Rs. $500 \times 6 = 3,000$

MZ Hospital

B. Stationary

Printing and Repot preparation Rs. 3,000

Grand total Rs. 60,000

Annex

Annex I : Format of questionnaires used during interview.

Annex II : Brief case study of few x ray chest P/A (Film to be printed)

Annex III : Photograph of a baby of annex II (b)

Annex I

Questionnaires

1. Name :
2. Age :
3. Sex :
4. Date :
5. Address : Rural/Urban :
6. Occupation :
7. Status :
8. Education :
9. Father/husband name :
10. Housing condition :
11. Height :
12. Weight :
13. No. of children -- (<12 yr > breast feed baby) ;
14. Chief complaints with duration (Cough, Sputum, blood, fever, chest pain)
 - a) First symptoms :
 - b) When first noticed ? day/week/month
 - c)
 - d)
15. Any associated diseases
16. First consultation made --
 - a) Where ?
 - b) Whom ?
 - c) How long ?
 - d) Any traditional healer, whom ?
17. Received any treatment.
18. By whom you are refers here ?
19. Past history of Tuberculosis ?
 - a) If yes When ?
 - b) Where he has treated ?

20. Is there any reason for delaying arrival in diagnostic center ?
 - a)
 - b)
 - c)
 - d) Did you visit private/hospital ? when ?
21. What was diagnosis – TB, Flue bronchitis, others unknown
22. Knowledge about NTP
23. Knowledge about tuberculosis/route of transmission
24. How to dispose expectorate sputum ?
25. Knowledge about protecting family member.
26. How far is DOTS treatment center from his house ? Less than 1/23 hr, less than 1 hr, less than 3 hr, ½ day, one day.
27. How far is microscope center from his house ?
28. Mode of travel-by foot/by bus/one night stay.
29. What are the messages received fro health worker of DOTs treatment center ?
30. Did you buy TB drug ? What ?
31. Family history of tuberculosis.
 - a) If yes, who ?
 - b) Where/when treated
 - c) For how long ?
32. Abnormal physical findings : if any.
33. Sputum smear for AFB (grading) :
34. Radiological findings and grading :
 - a) Minimal/moderately advanced/far advanced.
35. Treatment category :
36. Registration category :
37. Treatment center :
38. TB registration number of patient :
39. Date of commencement of treatment.

Date :

Signature of interviewer

Annex II

- a) CXR P/A view of a female, aged 22 years old resident of Sisiaya about 5 km. from zonal hospital gave history of pulmonary symptom since last 7 months, very Anaemic Hb = 4gm% admitted in hospital with her six month son CXR showed extensive bilateral pulmonary tuberculosis with cavitory lesion at both upper zone. Her sputum for AFB was (+++).
- b) CXR P/A view of master Laxman Khadayat aged 6 month S/o above described mother (II a) malnourished, severely anaemic with history of cough fever since last two months weight 4kg, Hb 5gm% course crepitation right sided chest CXR P/A revealed massive consolidation of right lung blood was transfused and TB treatment started.
- c) CXR P/A view of a male patient aged 55 years severely debilitated patient with history of illness since last 10 months. X ray finding was consistent with far advanced tuberculosis and was died in hospital before commencement of TB treatment with sputum smear examination. He was referred from a health post.
- d) CXR P/A view lesion consisted with moderately advanced associated COPD who have multiple consultation and treatment at health post but was not diagnosed his sputum smear for AFB was (++) positive.
- e) CXR P/A view of a 50 years old man associated with COPD presented with cough, sever haemoptysis for last 3 month. He gave history of illness since last 3 months and was treated at local health post several times. He did not feel well and came by self at zonal hospital. His CXR P/A view lesions was consistent with far advanced and sputum for AFB was (+++) positive

Annex III



References:

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Research Institute of Tuberculosis, Japan Anti TB Asso.

Budget expenditure

Research Title: Prevalence and Causes of delay diagnosis of advance infectious pulmonary Tuberculosis in Kanchanpur District

F.W. Region NEPAL

1st shrawan 2060 to 30th Poush 2060

Duration:

SNO	Name	Designation	Period of study	Allowance per month	Total amount	Signature
1	DR. S. R. KAYASTHA	Principal Investigator	1st shrawan to 30th Poush	5000/-	30,000/-	Sy
2	Mr. G. R. RIJAL	Co investigator	" "	3000/-	18,000/-	RS
3	Mr. Padam Bdr Shrestha	Lab. Asst	" "	1000/-	6000/-	Yash
4	Mr. Bal Krishna Suedi	Peon	" "	500/-	3000/-	TH
	Grand Total				57,000/-	