

Compliance to Directly Observed Treatment Short Course (DOTS) Chemotherapy among the Patient of Pulmonary Tuberculosis in Banke District of Nepal

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ABSTRACT

Tubercular infection is still a pervasive public health problem in Nepal despite the massive efforts of National Health Service stakeholders. High bacterial infectivity, transmissibility, increasing drug resistance and non compliance to the therapy have been adding up challenges to prevention and control of tuberculosis. This study was conducted to observe the treatment compliance pattern among new pulmonary sputum smear positive cases of tuberculosis. A cross sectional study was carried out in the year 2009. The 114 new smear positive pulmonary tuberculosis patients registered in the six selected DOTS centres of the Banke District were randomly selected. Participants were selected from each DOTS centre by probability proportionate sampling methods. Data were analyzed by SPSS (11.0 Version) and $P < 0.05$ was considered as significant. Overall compliance to DOTS was 86.80 percent; of these, 57.00 percent showed excellent and regular compliance followed by nearly 30 percent good compliance. And 13.20 percent participants were non compliant to DOTS therapy. Positive Family behaviors were positively associated with compliance while alcohol consumption was found to be negatively associated with compliance however; age, sex and income were found to be non significant factors for compliance. Feeling of getting cure even before the course of DOTS therapy (feeling better after 2-3 months regular treatment) and drinking habits were found to be the major causes of non compliance. Supportive family behaviors and avoidance of alcohol consumption may promote the compliance. Excellent treatment compliance in the face of many odds is highly encouraging and the pattern can be useful in treatment despite little non compliances; furthermore compliance can be enhanced by acting on these causes of non compliances.

Key words: Pulmonary, Tuberculosis, DOTS, Banke, Nepal

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INTRODUCTION

Tuberculosis (TB), an infectious disease caused by *Mycobacterium tuberculosis*, known to have devastating disease of humankind. It affects all ages and prominently reported among the most productive age population.¹ South East Asia Region carries the highest burden of tuberculosis (TB) cases accounting for one third of all cases from five countries, namely Bangladesh, India, Indonesia, Myanmar and Thailand account for 95 per cent of these cases.² Nonetheless, tuberculosis is one of the major public health problems in Nepal. About 45 per cent of the total population in Nepal is estimated to be infected with TB, out of which 60 percent are in adult age group. Every year, 40,000 people develop active TB, of them 20,000 have infectious pulmonary disease and 5,000-7,000 people still die per year from TB in Nepal.³

Tubercular infection is a unique; none of the single antimicrobial agent is sufficient to treat it. Furthermore, poor compliance to therapy results in adverse consequences: treatment failure, relapse and drug resistance with poor prognosis. Patient non-compliance remains one of the main obstacles.^{4,5} Directly Observed Treatment Short Course (DOTS) Chemotherapy is an initiative of government of Nepal with a priority issue which is found to be the cost effective intervention that has reduced the number tubercular cases. If national targets

of diagnosing 70 percent of new infectious cases and curing 85 percent of these patients will be achieved, many deaths can be averted and decline in the incidence of this disease.³ Therefore, this study was designed to identify compliance pattern and factors associated with noncompliance among TB patients who received Directly Observed Treatment (DOT) services.

MATERIALS AND METHODS

This was a cross sectional study; conducted among newly diagnosed pulmonary sputum smear positive patient registered in six DOTS centers: two specialty hospitals, two primary level health care facilities (Primary Health Care Center and Health Post) and two DOTS centers constituted by International Non- Government Organizations (INGOs). Of the 172 patients registered for Directly Observed Treatment Short Course (DOTS) chemotherapy in aforementioned six centers, 114 were randomly selected from the chronologically arranged list of patients under the therapy. Probability Proportionate Sampling (PPS) was applied for participant selection. Patients were categorized compliant or non-compliant by reviewing treatment cards. For the purpose of study, compliance was defined and categorized as: Excellent compliance: Patients who did not miss their tuberculosis treatment at all (punctual), Good

compliance: Patients who had missed their treatment <7 consecutive days, Non-compliance: patients who had missed their treatment ≥7 consecutive days. Hence, compliance level was classified into 3 categories: Excellent (punctuality), good (missing ≤7 consecutive days) and non-compliance (missing >7 consecutive days) using standard definitions. Researchers themselves collected data using structured interview schedule by face to face interview methods. Data on age, sex, monthly income, family support, access to TB services were collected. Data were analyzed using SPSS (11.0 Version). Pearson Chi-square test was used to assess the association and P<0.05 was considered to be significant.

RESULTS

Compliance rate is shown in table 1. About 57 percent had “excellent compliance” followed by 29.8 percent had “good compliance” rate among the participants whereas 13.2 percent were non-compliant to the DOTS therapy.

Table 1: Participants by compliance pattern

Levels of compliance	Frequency	Percent
Excellent compliance	65	57.00
Good compliance	34	29.80
Non- compliance	15	13.20
Total	114	100.00

The relationship between different independent factors and compliance pattern to DOTS therapy is shown in table 2. Overall compliance rate was 86.80 percent. Almost 50 percent participants were below 35 years and more than one-tenth participants were over 65 years. Of the compliant participants, almost half of them were below 35 years. Proportionately, all youngest age group (15-24 yrs.) showed compliance; more than nine out of every ten participant ≥55 years showed compliance whereas wide variation was observed for 25-54 years age population. And non compliance was observed to be the 6.67-26.67% in these groups. Age-wise compliance pattern was not statistically significant (15-39 Vs ≥ 39 years and < 35, 35-54 & ≥55 years), p values is >0.05. Nearly two-third participants were male and rests were females. Of the compliant participants, majorities were male and the compliance pattern was slightly higher in male in contrast to female of the respective group however, this difference was not statistically significant.

With the exception of nil income categories, there was directly proportional relationship between the patient’s monthly income and compliance rates i.e. increase in monthly income increased the total compliance rate. Of those, who had monthly income <500, two-third were compliant while about nine out of every ten participants with income more than 1000 per month were complaint to DOTS therapy.

Table 2. Relationship between various factors and compliance status

Independent variables	Category		Total	Proportionate compliance
	Compliance	Non-compliance		
Age- wise (in years) Compliance (n=114)				Age specific compliance
15-24	24(21.05)	0 (0.00)	24 (21.05)	24(100)
25-34	25 (21.92)	6 (5.26)	31 (27.19)	25(80.64)
35-44	15 (13.15)	3 (2.63)	18(15.78)	15(83.33)
45-54	11 (9.64)	4 (3.50)	15(13.15)	11(73.33)
55-64	14 (12.28)	1 (0.87)	15(13.15)	14(93.33)
65+	10 (8.77)	1 (.87)	11(9.64)	10(90.90)
Total	99 (86.80)	15 (13.20)	114(100.00)	99 (86.80)
$\chi^2=2.18$, df=2, p>0.05(Yates correction applied)				
Sex wise compliance				sex specific compliance
Male	64 (56.14)	9 (7.89)	73 (64.00)	64(87.6)
Female	35 (30.70)	6 (5.26)	41(36.00)	35(85.36)
Total	99 (86.80)	15 (13.20)	114(100.00)	99 (86.80)
$\chi^2=0.12$ df=1, p>0.05				
Family income/ month (in Nepalese Currency) and Compliance				
Nil	1 (0.87)	0 (0.00)	1 (0.87)	1 (100.00)
<500	2 (1.75)	1 (0.87)	3 (2.63)	2 (66.67)
501-1000	9 (7.89)	3 (2.63)	12 (10.52)	9 (75.00)
1001-2000	43 (37.71)	5 (4.38)	48 (42.10)	43 (89.58)
>2000	44 (38.59)	6 (5.26)	50 (43.85)	44 (88.00)
Total	99 (86.80)	15 (13.20)	114(100.00)	99 (86.80)
$\chi^2=1.23$ df=1, p>0.05, (yate’s correction applied)				
Family member’s support towards patient and compliance				
Remain usual/ positive	84(73.68)	7 (6.14)	91 (79.82)	84 (92.30)
Changed/negative	13(11.40)	6 (5.26)	19 (16.66)	13(68.42)
Living alone	2(1.75)	2(1.75)	4(3.50)	2(50.00)
Total	99 (86.80)	15 (13.20)	114(100.00)	99 (86.80)
$\chi^2=11.79$, df=1, p<0.05. OR=6.4				
Alcohol consumption status and compliance				
No	91 (79.80)	10 (8.79)	101 (88.60)	91 (90.09)
Yes	8 (7.01)	5 (4.38)	13 (11.4)	8 (61.53)
Total	99 (86.80)	15 (13.20)	114 (100.00)	99 (86.80)
$\chi^2=8.22$, df=1, p<0.05. OR=5.68.				

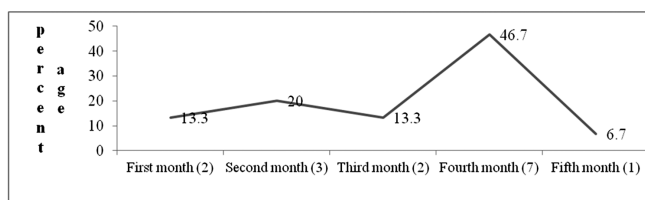
Figures in the parentheses indicate percentage.

Majority (73.68%) of the compliant participants belonged to the supportive families where they show positive/supportive behaviors and attitude towards the patients while declining rate of compliance was observed among the participants whose family members had negative/non-supportive behaviors to the patient and those who were living alone (11.4% & 1.75%) respectively. Proportionate compliance shows the similar trend i.e. more than nine-tenth participants belonging from supportive families were compliant. However, the compliance rates widely vary for those who were from either non- supportive families or who was living

alone (68.42% & 50%) respectively. The differentiation was statistically significant where patients belonging from supportive families were more than six times more likely to be compliant than those who are from others (OR,6.4).

Majority of the non alcoholic patients were compliant to DOTS therapy. Proportionately, only two-fifth alcoholics and nine-tenth non alcoholic participants were compliant to the DOTS therapy and the difference was statistically significant. Non alcoholic patients were more than five times more likely to be service compliant than those who are alcohol consumers.

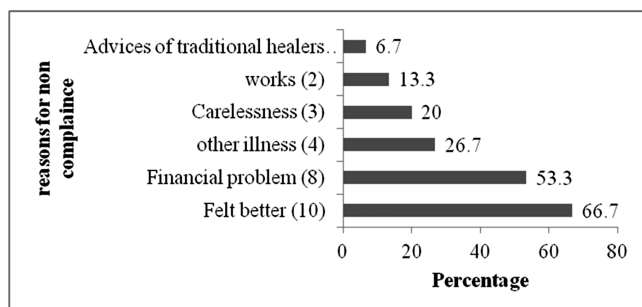
Non compliant participants by month of the interruption (n=15)



Figures in the parenthesis are values

Figure 1: Non compliance by month of the interruption of DOTS therapy

Reasons for non compliance (multiple responses)



Figures in the parenthesis are values

Figure 2: Reasons for non compliance to DOTS therapy

Of the non compliant patients, highest rate (46.7%) of interruption was observed in fourth month followed by 20 percent in second month, then in first & third and least at fifth month. None of the participants had interrupted after fifth months of treatment course. Feeling of getting rid of/cured was found to be the major reason of interruption (66.7%) followed by economic problem (53.3%), carelessness (20%), other illness (26.7%), work (13.3%) and advices of traditional healers (6.7%).

DISCUSSION

This study reveals the excellent compliance rate of 57

percent and good compliance (30%). Overall compliance rate was 86.8 percent while 13.2 percent were not compliant to the DOTS therapy. Study findings are in favor of national targets: One of the most important objectives of the National Tuberculosis Control Programme of Nepal is to achieve 85 per cent cure rate. That can be achieved and sustained only through patient compliance to anti-tuberculosis treatment.³ This is consistent with the study by Somrat *et. al.*, who found excellent compliance 65.7 per cent, good compliance 22.8 percent (Overall 88.5%).⁶ Moreover, findings are somehow consistent with the study of Cator *et. al.*, Kumar *et. al.*, and Bam *et. al.*, who reported 80.2 percent, 89.4 percent and 75 percent compliance respectively.^{4,5,7,8}

Study has shown that sixty percent of non-compliant fall in the age group 25-44 years. The compliance was higher among those families with family income more than 1000 rupees (NC) as compared to those families earning below 1000 rupees; the difference was however not statistically significant. In this study, in 92 percent patients had maintained same relationship even after having tuberculosis and they had good family support (financial, informational, emotional and logistics). This differs with the findings of Bom *et. al.*,⁵ Eighty percent families in Kathmandu had supportive in case of compliant patients. Alcohol consumption was one of the major factors for non-compliance. The similar findings were reported in the study of Fernando *et. al.*, and Santha *et. al.*^{9,10}

Two third non-compliant patients discontinued their treatment after completing intensive phase (two month). Feeling of getting rid/cured (66.7%) followed by economic problem (53.3%) were major reasons for non-compliance to DOTS. The findings are in agreement with the study done by Kaona *et. al.*; found felt better (45.1%) was the major leading cause of non-compliance. Dodor *et. al.*, and Ghana reported that financial difficulties were major reasons for default.^{11,12}

CONCLUSION

The study revealed excellent (57%), good (23%) and 13.2 percent were non-compliant to DOTS. Alcohol drinking and negative/non-supportive family behaviors were significant factors affecting treatment compliances. The highest non compliance was observed at fourth month of treatment. Avoidance of Alcohol consumption during treatment of TB and promoting supportive behaviors increase the compliance to DOTS therapy. Excellent compliance observed in this study might act as a monitoring tool for the policy and decision makers to design and implement anti -TB programmes.

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