INTRODUCTION

I

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Tuberculosis (TB) remains a major global public health problem particularly in developing and underdeveloped countries. Globally it is responsible for more than three million deaths each year (WHO, 2004). The risk of tuberculosis is greater in areas of residence characterized by crowding, poverty, lower education, HIV/AIDS etc. (Lifson *et al.,* 1999). In 'vedes' and other ancient Hindu texts, it was mentioned as 'Rajayakshman' the king of disease.

TB is usually caused by the genus *Mycobacterium* having over sixty well-defined species. Four very closely related species are responsible for mammalian tuberculosis. *Mycobacterium tuberculosis* (human tubercle bacillus) and occasionally by *Mycobacterium bovis*, *Mycobaterium africanum* and *Mycobacterium microti* (vole tubercle bacillus) and all are classified as *Mycobacterium tuberculosis* complex. It is primarily a disease of the lung (80%) termed as pulmonary tuberculosis (PTB) and spread by the inhalation of infected droplet nuclei or by coming into direct contact with infected person. Prime symptoms in case of PTB are cough for more than 3 weeks with or without blood. Fever, night sweats, loss of appetite, weight loss chills, pain in chest etc. PTB can be diagnosed by sputum examination (smear and culture), tuberculin test, chest x-ray etc. Direct Observed Treatment Short Course (DOTS) is a short course of chemotherapy used to cure the tuberculosis patients. It is given to the patients under the direct supervision of the health workers that involve at least a six-month (6-8) antibiotic regimen. This strategy is said to cure more than 90% of new smear positive patients and reduces

spread of infection by breaking the chain of the treatment (WHO, 1999). Countries around the world began applying DOTS in the early 1990s (WHO, 2004). However it was introduced in Nepal in April 1996 only. In July 2003, 94% of population was covered by DOTS with 324 treatment centers and 1154 sub-centers with more than 85% treatment success rate (Bam, 2002).

Tuberculosis does not spare any tissue organ of the body. Tuberculosis outside the lung is called extra pulmonary tuberculosis. Extra pulmonary tuberculosis results by haemateogenous spread of the organism from a primary focus which is not always detected. The important organs that are affected include bones, kidneys, meanings, lymph nodes, female pelvic organs (ovaries, tubes, endometrium) testis and intestine. Extra pulmonary tuberculosis, although less common in comparison with pulmonary tuberculosis, is never the less important public health problem in many tropical countries.

According to WHO (1998) one third of the world population is estimated to have been infected with *M. tuberculosis* and eight million new cases of tuberculosis arises each year. The majority of tuberculosis patients are in 15 to 45 years of age, (persons in their most productive years of life). Hornick (1993) states that approximately 75% of those infected with tuberculosis are under the age of 50. Grange (1990) has reported that worldwide about 100 million persons are infected with tubercle bacilli annually. Overt disease develops in between 10 and 20 million,4-5 million become open or infectious and about 3 million die of the disease each year.

According to Godlee and Kalzuig (1993) tuberculosis is the world's leading cause of death from a single agent. Kobayashi *et al.*, (1997) stated that infections caused by Mycobacteria are the leading cause of death

from infectious disease. Keystone (1993) reported that tuberculosis has now become the number one infectious and killer disease globally. Persons who will live for prolonged periods in developing countries and those who will have close contact with locals are at increased risk of exposure. In general the incidence of tuberculosis is higher in men than in women. Ghai and Gupta (1999) states that both the sexes are equally susceptible in early childhood. The disease is more frequently observed in girls during adolescence and in males during adulthood. According to Baral *et al.,* (1993) male patient out numbered female patient in a study carried out in 1998 and 1990. Smith *et al.,* (1994) reported that higher prevalence of infection in males than females from tuberculin survey carried out in Gorkha district.

TB Situation in Nepal

Nepal a developing country having about 61.4% of people illiterate who are not aware of health matters and donot have idea of hygienic living habit. So, they are always in the threat to infections caused by *Mycobacteria*. Tuberculosis cases are scattered all over the country but majority of cases are in rural areas where more than 90% of population reside. Tuberculosis (TB) is a major public health problem in Nepal. About 45 percent of the total population is infected with TB, of which 60 percent are adult. Every year, 40,000 people develop active TB, of whom 20,000 have infections pulmonary diseases. These 20,000 are able to spread the disease to others. Although introduction of treatment by Directly Observed Treatment Short Course (DOTs) has already reduced the numbers of deaths, however, 5000-7000 people still continue to die each year from TB (NTC Annual Report 2005/2006). Bam (2002) stated that every year 44,000 people develop active TB of whom 20,000 have infectious pulmonary disease. These 20,000 are able to spread the disease

to others. The pandemic of HIV infection and the development of drug resistant tuberculosis are the two major factors contributing to the increase in tuberculosis.

About 60% of adults and 45% of general population have been infected with the disease. Nearly 2% of people are infected every year. As TB spreads through the air, it is not surprising that the highest rates of infection have been found in most densely populated areas. Such as Kathmandu valley and other urban areas. Nearly 90,000 people currently have TB half of these have infection (sputum smear positive) and continue the chain of transmission. Over 2,20,000 people will develop TB during next five years. The majority of these patients will be people of economically active age group of 15-45 years. The adult men are more frequently exposed to infection than women because women have less access to health care services than men (HMG/NP, 2003).

DOTs, which has proven its efficacy in Nepal, will have a profound impact on mortality and morbidity in Nepal. By achieving the global targets of diagnosing 70 percent of new infectious cases and curing 85 percent of these patients DOTs have been successfully implemented throughout the country since April 2001. NTP has productive coordination with private sector, local government, NGOs, social workers, educational sectorals and other sectors of society. By July 2006 DOTs had been expanded to 560 centers with 2,795 sub centers. The treatment success rate in DOTs in now 88 percent Nationally 2005/2006 33,207 TB patients have been registered and being treated under the NTP. (Annual Report, NTC, 2005/2006)

Significance of Study

Nepal a developing country, having only about (38.6%) of it people literate but majority of people (61.4%) are illiterate who are not aware of

health matters, they are always in the threat to infections caused by mycobacterium. TB cases are scattered all over the country but majority of cases are in rural areas where more than (90%) of population reside. In Nepal, the annual rate of infection is estimated at about (3%). It is about (1.5%) in hilly area, (4%) in urban area, and less than (1%) in mountain area.

The NTC Annual Report 2061/2062 showed that the Gorkha district is highly infected in TB disease. The present study has been undertaken in Gorkha district to find out the present situation of prevalence of pulmonary tuberculosis and awareness regarding TB among the Gorkhali people.

OBJECTIVE

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OBJECTIVE

General Objective

To find out the prevalence of pulmonary tuberculosis among suspected cases visiting Gorkha District Hospital Gorkha and to assess their knowledge attitude and practices towards transmission of TB.

Specific Objectives

(a) To find out the general prevalence of *Mycobacterium tuberculosis* among suspected cases visiting Gorkha District Hospital.

(b) To find out the prevalence of *Mycobacterium tuberculosis* in different sex and age- groups.

(c) To find out the knowledge, attitudes, awareness and practices of the suspected cases in relation to TB transmission.

(d) To find out the rate of smoking and PTB positive.

LITERATURE REVIEW

III

LITERATURE REVIEW

HISTORICAL BACKGROUND OF TB

Tuberculosis (TB) is a serious public health challenge, not only because of its percennial tolls of death and disease but also because of its clear links with poverty. It was found in fragments of spinal column of Egyptian mummies. Around 460 BC, Hippocrates identified TB as the most wide spread disease at that time noted that it was almost always fatal. In 1679 sylvius was the first person to describe the actual tubercle as a consistent change in the lungs and other areas of body. He also described the progression to abscess and charities.

In 1702 Manget described the pathological features of military (disseminated) TB.

In 1720, an English physician Benjamin Marten published "A new theory of consumption". He stated that TB could be caused by "minute living creatures" which, one they entered the body, could generate the lesions and symptoms of the disease. He also stated that with frequent contact with a TB patient, consumption could be caught by a health person. For the early 18th century. Dr. Martens writing display a great degree of epidemiological insight.

In 1774-1816 Laurent Bayle introduced the term tuberculosis and traced the relation between pulmonary tuberculosis.

The modern knowledge of tuberculosis started from the work of Rene Theodore Laennec (1781-1826) a French clinician who himself was consumptive and succumbed to the disease. In 1819 he invented the

stethoscope and accurate description of tuberculosis lesions (Rao, 1981, Dey and dey, 1982).

In 1827-1892 Jean - Antoric Villimin (1827-1892), a French military, surgeon,. The transmissible nature of tuberculosis was clearly established.

In 1854 Hermann Brehmer presented his doctoral dissertation entitled "Tuberculosis is a curable disease".

In 1882. Ehrlich the acid fast nature of the organism was discovered and the present method of acid fast staining was developed by Ziehl (1882) and subsequently modified by Neelsen and Hence the name Zeihl-Neelsen stain (Day and Day, 1982).

In 1882 Robert Koach discovered a staining technique that could identify *Mycobacterium tuberculosis*. However, the measures available at the time to doctors were modest. Improving social and sanitary conditions and adequate nutrition were all that could be done to strengthen the body's defense against the TB bacillus. Sanatoria, provide a dual function. They allowed for the isolation of the sick who were the sources of infection for the general population, and with the patient having enforced rest together with proper diet assisted in the healing process.

In 1895 Wilhelm Konard von Rontigen discovered the x-ray, which was used to enhance diagnostic capabilities.

In 1910 Mantoux the intradermal skin test method developed. He is still preferred method for identifying persons infected with M. tuberculosis. Kaoach's failure did not however dampen enthusiasm for controlling the disease. A few years before Koach's discovery of tubercle bacillus, be rest had been advocated as a treatment of tuberculosis and the sanatorium movement began in both Europe and the United States. Schenk had used liver oil as chemotherapy in tuberculosis in 1882.

In 1927 Peroy Moxcy introduced an antimony preparation to be used through the intra-muscular route. In the modern period, the search for chemotherapeutic drugs was activated by Domagk's introduction of Prontosil, Promin, Promizole, Sulphefron etc. have been found useful against tubercle bacillus. All these were found to be extremely toxic and given up (Rao, *et al.,* 1981). Following Koach's discovery of the tubercle bacillus, an intense interest in chemotherapy of the disease developed. None of the drugs studies in animals and men showed great promise. However, until the discovery of streptomycin by Waskman and co-workers in 1944, trails by British Medical research council (BMRC) the United States Public Health Services (USPH) and the US Veterinarian administration armed forces co-operative trails group confirmed its officially but drug resistance emerged as a series of drawback. Therefore, in an effort prevent resistance in 1948 the MRC undertook a successful trails of combined streptomycin, Para Amino Salicyicaid (PAS) therapy (Medical Research Council 1950). By 1952, isoniazid had become an important part of the initial treatment regimen. It was not until the early 1960s that a MRC trail settled the optimum duration of treatment for 2 years (Medical Research Council 1962). A number of trails conducted during 1950s and 1960 also demonstrated that treatment could be effectively given on an outpatient basis and that hospitalization and bed rest were necessary.

TB Research in Global Perspectives

Narang *et al.,* (1992) reported smear and culture positive cases of PTB in Wardha district of India. They conducted a door to door survey of 7,73,493 population to detect the symptomatic suggestive of PTB. A total of 12,834 symptomatic were detected. Sputum specimens obtained from 11,897 (92.7 percent) symptomatic were subjected to smear microscopy

by Ziehl - neelsen (Z-N) method and culture on L-J medium. Positive by either smear and culture or both were 1,252 cases over on half of them (56.23 %) were detected only by culture.

Reider (1996) studied the sputum smear conversion during directly observed treatment for TB from 16 April 1991 to 29 March 1994 at a refugee camp in Thailand. He examined the 259 new sputum smear positive patients in whom at least one of three sputum samples obtained was positive of AFB on a smear stained by the Z-N method. Of these 231 were completed 6 months course by the end to the observation and remaining 28 were still on treatment. The conversion rate of sputum smear reported (38.5%) were strongly positive 35.9 percent were moderately positive and (25.5%) were weakly positive at diagnosis. The initial sputum smear positively was strongly correlated to the extent form of pulmonary disease and the agreement between culturally and microscopically identifiable bacilli was good.

Murhekar *et al.*, (1998) studied on present day status of PTB in Anadamas and Nicobar Islands by Sputum smear microscopy from the chest symptomatics aged 10 years and above. A total of 190 (11.18 percent) chest symptomatics were reported from the first cluster of 1,700 of whom sputum positive and suspected cases were 5 and 7 respectively. Similarly it sputum positive and 22 uspsted were reported after the screening of 7,172 population format he second culture.

M. Muniyandi *et al.*, (2000) study was conducted in Tiruvallur district of Tamil Nadu, South India. Patients diagnosed with TB and registered for treatment under the National Tuberculosis control Programme during the 6 month from July to December 2000, were interviewed. A semi-structured and protested schedule was used for data collection. A total of 980 patients were registered during the study period of which 896

patients were interviewed. The economic status and SLI of the community compared with that of TB patients registered under the programme, as compared to the distribution of SLI of TB patients where low SLI was observed in 64% in 64%, medium in 32% and high in 4%. This study clearly shows that two thirds of TB patients who have access to the TB programme were poor and meets the health need of the most vulnerable segment of the population.

Rano Mal *et al.,* (2000) studied to know the prevalence of primary drug resistance in Karachi Pakistan. It was hospital based study done on new pulmonary TB atients in year 2000 at outdoor facility of the department of Thoracic Medicine. Out of 100 culture positive new pulmonary TB patients 24% showed resistance to one of more Anti TB drugs. Primary MDR was 1% INN and Rifampic in resistant were 16 and 7% respectively. Primary drug resistance occurs in high proportion of cases. It falls within the range of high prevalence countries.

Sarin *et al.,* (2001) studied on diagnosis of TB and examined two or three sputum specimen was conducted in the LRS institute of TB and Allied diseases, New Delhi from a single individual. In all 92.2% and 24.9% sputum positive patients were diagnosed out of 3.738 and 4,189 new chest symptomatic from the year 1998 and 1999 respectively. The overall sputum positively content was around 25% and 90.5% sputum positive patients were detected by the first spot, specimen. Of the three sputum specimen, the early morning had the best result as compared to other two spot specimens. They reported that, two sputum smears were an effective as three smear for screening chest symptomatic under the field conditions.

David *et al.,* (2001) reported the value of examining 3 acid fast Bacillus form sputum smears for the removal of patient suspected of having TB

form the air bore precautions category in UNC hospital USA. Respiratory culture from the total of 42 patients grew. *M. tuberculosis* of these 36 patients (81%), 1 patients (2%) and 40 patients (95%) had the positive culture on first, second and third submitted specimens respectively. Respiratory culture from 12% patients grew without a positive AFB smear result. In this study, the number of negative smears required, before removal of patients from air borne precaution category which space little increasing risk of speeding TB.

Mc Williams *et al*., (2002) induced sputum and bronchoscopy in the diagnosis of pulmonary TB. Out of 129 subjects who completed all tests, 27 (21%) had smear negative and culture positive specimens, 14 (52%) on bronchoscopy and 26 (96%) on induced sputum ($p<0.005$). One patient was culture positive on bronchoscopy alone compared with 13 on induced sputum alone; 13 were culture positive on bronchoscopy alone compared with 13 on induced sputum alone, 13 were culture positive on both tests. Induced sputum positively was strikingly more prevalent when chest radiographic appearances showed features of active TB (20/63,32%) than when appearances suggested inactivity (1/44, 2% $p<0.005$). Induced sputum costs were about one third those of bronchoscopy and the ration of costs of the two tests per case of TB diagnosed could be as much as 1:6. In subjects investigated for possibly active or inactive TB who produce on sputum or have smear negative sputum, the most cost effective strategy is to perform three induced sputum tests with out bronchoscopy. Induced sputum testing carries a high risk of noscomial TB unless performed in respiratory isolation conditions. The cost benefits shown could be lost if risk management measures are not observed.

El-Sony *et al*., (2003) studied the symptoms among the patients attending health services for diagnosis of PTB in between 15 and 49 years age

groups with respiratory symptoms seen consecutively in the chest out patients department of hospitals and chest clinic at health center from March 1998 to 1999. A total of 16,735 patients (52.6%) males and (47.4% females) 5338 patients (54.6% males and 45.4 females) were identified with respiratory tract symptoms of these 963 were diagnosed as TB cases: 763 were pulmonary cases, 504 sputum smear positive and 259 sputum smear negative and 166 were extra PTB cases. The remaining 4,409 suspects were non-tuberculosis cases. They reported the cough most frequently among all the chest patients with conditions other than TB. The majority of PTB patients were complained of shortness of breadth and chest pain: and smaller proportion had haemoptysis. Sputum smear were stained by Z-N techniques.

Tam *et al.*, (2003) studied on TB in Hong Kong patient characteristics and treatment outcome between 1 January 1996 to 31 December 1996 in department of Health, Hong Kong. There were 5757 patients for analysis. Approximately one third of patients were aged 60 years or older, and 69.1% were male. Pulmonary disease alone occurred in 77.7% of patients, while both pulmonary and extra pulmonary disease occurred in 8.6%. New patients comprised 84.6% of cases, and 16.3% had concomitant illnesses. There was excess risk of disease among patients who were male, elderly, or who had silicosis. Only 0.1% of patients were con infected with HIV. Among the 5757 cases evaluated, 1324 (23.0%) were new patients with a positive sputum smear, 299 (5.2%) were patients who were tetreated with a positive sputum smear and 4134 (71.8%) were new patients with a negative sputum smear. The overall treatment completion rates at 12 and 24 months were 80.4% ad 84.8% respectively.

Chan *et al.* (2004) treatment and outcome analysis of 205 patients with multidrug-resistant TB, with strains resistant to a median of six drugs and

compared the results with those of our previous series. Logistic regression and survival analysis were used to evaluate short and long-term outcomes, respectively. Initial favourable response, defined as at least three consecutive negative sputum cultures over a period of at least 3 months, was 85% compared with 65% in the prior cohort. The current cohort had greater long-term success rates, 75% versus 56% and lower TB death rates, 12% versus 22%, than the earlier one. Surgical resection and fluorofuinolone therapy were associated with improved microbiological and clinical out comes in the 205 patients studied after adjusting for other variables. The improvement was statistically significant.

Vasankari Tuula *et al.*, (2004) the deceased were divided into 2 groups, 'overt' disease and 'cryptic' disease, on the basis of chest x-ray findings. There were 114 overt (mean age 79%) and 140 cryptic (mean age 78%) military TB cases. The majority of patients in both groups were females. There was no difference between the group in history of previous TB, in predisposing factors or in symptoms. Suspicion of TB was recorded before death in 86% in overt from and in 53% in cryptic form. In overt disease 50% of the patients received chemotherapy, but in cryptic form. Only a quarter were treated. In on third of cases autopsy had been carried out without suspicion of TB. Suspicion of TB had arisen too seldom, especially in the cryptic group on the other hand, those suspected to have TB were not prompthly treated with the appropriate chemotherapy. Absence of suspicion and delayed diagnosis mean increased risk in health care and at autopsy.

Naz *et al.*, (2005) a study of the trend in prevalence of opportunistic candidal co-infections among patients of pulmonary TB. 500 clinical specimens of sputa, bronchial aspirations and pleural effusions were collected from hospitalized tuberculous patients for the isolation of

candida species. The patients were categorized in two group. Group A included TB patients having some complications and group B included TB patients having no complications. The candida species were isolated and identified on the basis of morphological, cultural and biochemical characterisitics. Candida species were isolated from 15.2% (76/500) specimens. The incidence rate of candidal co-infection was higher in group A patients (16.1%) as compared to Group B patients (13.8%). The incidence of candidal infection was higher in male patients (16.3%) as compared to female patients (13.9%).

Chadha *et al*. (2005) annual risk of TB infection in Khammam a tribal district of Andhra Pradesh during 2001-2002. A total of 8637 children were test-read - 2991 without BCG scar and 5442 with BCG scar. The tests were performed using ITU PPD RT 23 and the maximum size of indurations was recorded at about 72 hours after the test. Based on the frequency distribution of reaction size, cut-off point for infection with tubercle bacilli was considered at 12 mm. Using this criterion, the prevalence of infection was estimated at 11.8% among children without BCG sear and 10.6% among children with BCG sear. This difference was found to be statically insignificant. AIM rates computed from the prevalence estimates among children without and with BCH scar were 1.6% and 1.5% respectively. It was computed as 1-5% from the prevalence in the combined group i.e. irrespective of BCH scar status.

Filinyuk *et al.,* (2006) functional activity of phagocyte blood cells in pulmonary TB. The characteristics of the functional activity of phagocyte blood cells in patients with destructive and medicinal resistant infective agents were studies. In the process of pulmonary TB irrespective of the phagocytic activity of neutrophil granulocytes and the level of the expression of for-and c3b receptors on monocytes with a simultancous increase in the spontaneous production of oxygen metabolites in

neutophils and a rise in the adsorptive capacity of monocytic, cells were observed.

Kumar, P., *et al.,* (2006) paucity on district level data on the prevalence of HIV infection in TB patients in India, prompted us to undertake this study on HIV sero prevalence among new smear positive PTB patients in the district of Mandya. The study design was a cross-sectional one and was carried out during June-August 2005, in a representative sample of 152 new smear positive PTB patients diagnosed in the Designated Microscopy centers of Mandya district during the second quarter of 2005. The study was conducted in a sample of DMCS selected by stratified sampling. In the selected DMCs, blood samples from required numbers of consecutively diagnosed cases were subjected to HIV testing using comb and Tridot tests. A sample was declared positive if the results of both tests were positive. The estimated HIV seroprevalence among PTB cases was 4.6%. However, the HIV sero prevalence observed in the present study is much lower than that seen in several African countries. Nevertheless, as there is a large pool of people infected with both HIV and TB in India, there could be a substantial increase of TB cases in future.

Leung *et al.,* (2007) delayed presentation and treatment of newly diagnosed PTB patients in Hong Kong. Main outcome measures Health - seeking behaviour of PTB patients, including respective demographic, clinical and disease factors. A total of 6262 notified TB patients in 2004, 1662 (26.5%) were recruited into the study, of these, 42.6% first presented to private doctors, and 57.4% to the public sector. The diagnosis of TB was made in 13.7% of these patients by the former and 86.3% by the latter. The median patient delay (elapsed time from symptoms to medical consulation) and provider delay (elapsed time from medical consulation to treatment) were both 20 days; 25th to 75th

percentiles being 7-37 and 6-55 days, respectively. Longer patient delay was associated with positive sputum smear and culture, and more extensive radiological disease. Patients older than 60 years, with no initial sputum and chest x-ray examination predicated longer provider and total delays. Our patient and provider delays compared favourably with those of other countries and very likely reflect easy service access. Adverse social factors and non-specific presentations prolong patient delay, whilst older age and unavailable bacteriological/ radiological evidence delay diagnosis and treatment.

Bukhary *et al,. (*2007) studied assessed TB treatment outcome, cure-to-treatment ratio and mortality among all types of TB patients in a tertiary care setting in Saudi Arabia. All cases diagnosed and treated for active *Mycobacterium* tuberculosis infection between 1991 to 2000. Data collected included type of TB involvement, treatment outcome, relapse, and co-morbidities. A total 535 cases of tuberculosis were disagnosed and treated. Isolated PTB was identified in 141 cases (26.4%), extrapulmonary TB in 339 cases (63.3%) and combined pulmonary and extrapulmonary disseminated involvements in 55 cases (10.3%). Co-morbidities were noted in 277 (52%) patients. Immunosuppression was patients. Immunosuppression was found in 181 (34%) patients. The cure rate was 82%. The cure-to-treatment ratio was 86% in extrapulmonary TB and 78% in PTB, and 65% in disseminated TB. Overall mortality was 18%. Disseminated TB had the highest mortality (34-9%), Followed by pulmonary (21.8%), then extrapulmonary TB (13.6%). 47% of all mortalities were directly related to TB. Despite tertiary care support, complicated TB carries a high mortality. Earlier diagnosis and complete appropriate chemotherapy are essential for improved outcome.

Literature Review on TB in Context of Nepal

Subedi (1985) studied on tobacco smoking and its effects on lungs among the patients attending in the chest department of Tri-chandra Military Hospital. A total of 1336 patients with some respiratory symptoms, 885 (66.24%) were smokers and 451 (33.75%) were non-smokers. Of 885 smokers, 431 (48.7%) had the PTB and 168 (37.25%) had PTB out of 451 non-smokers. He concluded that prevalence of PTB was higher among the smokers in comparison to non-smokers.

Karki (1993) conducted a study for prevalence of alcohol. "Khaini" and smoking habits in Nepalese population. Personas smoking currently were considered as smokers. Those person who had never smoked in their life were non-smokers. Similar criteria were applied of "Khani" and alcohol consumption. Among 203 smokers, 163 were male and 40 were female, among 262 a alcohol consumers. 225 were male and 37 were female and among the 126 "Khaini" chewing persons 116 were male and 10 were female.

Shrestha (1989) reported (47%) male and (3.05%) of female TB cases in the his to pathological specimens at Tribhuvan University, Teaching Hospital (TUTH).

Smith *et al.,* (1993) found that higher prevalence of infection of TB in males than females from the tuberculin survey carried out in Gorkha district. Smith (1996) also reported the incidence was higher in males than females.

Jha *et al.,* (1999) surveyed smoking and smokers in Sunsari district from the B.P. Koirala Institute of Health science Dharan. They performed the study in 1994 with the structured questionnaire among the 8,643 randomly selected participants in about smoking habits, quantity and time duration of smoking. Of the 8,643 participants, (17.5%) were smokers

and smoking was found most common among the 50-64 years age groups. Among them (68.4%) belonged to the low socio-economic group, (11%) of the smokers were smoking more than 20 sticks per day and (42%) were smoking from more than 20 years.

Johsi (2003) A total of 70 symptomatic (40 male and 30 female) individuals from 125 randomly selected household were subjected to smear microscopy by Ziehl-Neelsen's method during March 2002 to August 2003 in Kanehanpur District. Pulmonary tuberculosis prevalence among total symptomatic individuals was found to be 9%. Out of (10) total smear positive cases infection in male and female was found to be 80% and 20% respectively. High prevalence of disease was revealed among the economically productive age group of 20-49 years. The prevalence of bovine tuberculosis was estimated from all (n = 10 houses) sputum positive cases and 15% houses with sputum negative cases for verification. Since tuberculosis in both cases in high.

Joshi *et al.*, (2003) this cross sectional survey was conducted to determine awareness about TB among the tuberculosis patients (total 58) visiting in DOTS clinic of Patan Hospital. This study reveled that out of total 31 cases, (80.65%) were found in productive middle age groups (15-19 years). In addition, we found that (84.48%) were familiar about TB disease but more than fifty percent were unaware of DOTS program. Regarding treatment, (55.17%) patients had an idea about medical treatment. Further (24.14%) were smokers before disease diagnosis and they smoked between one to twenty cigarettes per day. Smoking is considered to be one of predisposing risk factor for pulmonary tuberculosis. Out of total 14 smokers, (64.29%) had pulmonary TB. In relation to occupation (36.21%) patients were students (29.31%) were workers and (8.62%) were Job holders and remaining (18.96%) were jobless. More than half of the patients were in low economic level. Interestingly our study showed highly significance between sex and smoking hehaviour.

Bam T.S., *et al.,* (2004) a cross-sectional study was conducted to identify the factors responsible for non-compliance among tuberculosis patients in Kailali district between December 2004 to March 2005, among 130 compliant and 25 non-compliant tuberculosis patients, randomly. Selected from four DOTS treatment centers. About half (48%) of non-compliant were more likely to think that treatment could be stopped once they were free of symptoms and thought they were cured. A significant relationship was found between compliance behaviour and availability of health workers at DOTS center ($p<0.05$). DOT ($p<0.001$), mode of transportation, and traveling time ($p<0.001$). Adherence is affected by educational level, knowledge, availability of health workers, directly observed treatment, and traveling time. It could be improved by provision of more information about tuberculosis and expansion of DOTS near to the patient's home.

Jha *et al.,* (2005) a cross sectional study was conducted to estimate the proportion of HIV infection among diagnosed TB patients in two centers of Nepal. Among 581 registered TB patients tested for HIV (500 at NIC and 81 at IMHRC). I patients were HIV positive. Among 500 TB patients at NTC, 59 were registered in DOTS-PLUS as MDR-TB cases; among them 3 were HIV positive. Overall HIV prevalence among TB patients was found to be (1.55%). This study showed low HIV prevalence among TB patient in comparison to the previous study done in 2001/2002 at NTC (2.44%). But HIV prevalence among MDR-TB is considerably high. There is a need to conduct prevalence study at sentinel sites representing entire country and extensive further study among MDR-TB patients.

Bam *et al.,* (2006) studied to identify the factors responsible for non-compliance among TB patients in Kailali district Nepal. A cross-sectional study was conducted, among 130 compliant and 25 non-compliant TB

patients, randomly selected from four DOTS treatment centers, using a structured questionnaire with face-to-face interview. About half (48%) of non-compliant were more likely to think that treatment could be stopped once they were free of symptoms and though they were cured. Adherence proportion was high among the higher education group ($p<0.001$) were statistically significant difference between the compliant and non-compliant patients. A significant relationship was found between compliance behavior and availability of health workers at DOTS center ($p<0.005$), DOT ($p<0.001$), mode of transportation, and traveling time ($p<0.001$). Adherence is affected by educational level, knowledge, availability of health workers, directly observed treatment, and traveling time. It could be improved by provision of more information about tuberculosis and expansion of DOTS near to the patient's home.

Jha *et al.*, (2006) surveyed to ensure the selected laboratories provide facilities which are correct and relevant to the clinical situation of the TB suspects or chest symptomatics. From the available list of private laboratories in Kathmandu and Bhaktapur district, 10 laboratories working for sputum microcopy were identified. For each of the participating laboratories a panel of 10 slides stained with Ziehl-Neelsen was prepared in SAARC TB Reference Laboratory and dispatched. Each center was requested to have the slides read independently by two (or one if two is not available) readers and send back the results and the slides within two weeks to STC reference lab. Of the nine laboratories took part in the first round testing; only one laboratory had a Quantitative Error (QE). None of the laboratories have shown any major error. Prior to involvement of private laboratories in TB control at least external quality assessment (EPT) activity in private laboratories needs to be done.

Prevalence of Tuberculosis in Nepal

a) Human: - Tuberculosis patients (in some percentage) are found in almost all the populated districts of Nepal. To combat the disease National Tuberculosis control project was established. In 1968, the Japanese Medicine co-operation team of Kurume University listed Nepal and aid was provided through the Japan International co-operation agency (JICA). The main goals of this project were (i) BCG vaccination of children under 15 years of age, (ii) Diagnosis of pulmonary tuberculosis of case finding and (iii) Treatment of patients found sputum positive. In 1976 to develop a concrete strategy for tuberculosis control program a pilot project was started in Syangja district (Hirota *et al.,* 1977) at present nation wide TB control has been started. Morbidity and mortality data (hospital in patients) on TB from different hospitals beside central chest clinical for the year 1978/79, 78/80 and 80/81 are recorded. Pulmonary cases were 820 (60.61%) 693 (67.68%) 1094 (72.69%) and extra pulmonary cases were 533 (39.39%) 331 (32.32%) and 441 (27.31%) for the years 1978/79 to 1979/1980 and 1980/1981 respectively (Joshi, 1986).

b) Animal:– In one study double intradermal tuberculin tests on 39 buffaloes and 6 bullocks were carried out in Pokhara. The prevalence rate of TB was (23.10%) (33.33%) in buffaloes and bullocks respectively (Joshin *et al.,* 1974). Meat inspection study was carried out the prevalence rate of TB in buffaloes was (14.0%) (3232 buffaloes examined slaughtered and 452 animals found positive for different forms of TB). This means that there is a high prevalence rate of bovine TB in buffaloes (Joshi 1986).

New STOP TB Strategy

The national TB Control Programme adopted the following new Stop TB strategy officially at the occasion of World TB Day 2006. This strategy is based on the Global Stop TB Strategy recommended by Stop Partnership and World Health Organization.

The Stop TB Strategy

Vision: Nepal free of TB

Goal: To dramatically reduce the National burden of Tb by 2015 in line with the Millennium Development Goals and the Stop TB Partnership targets.

Objectives

- Achieve universal access to high-quality diagnosis and patient-centered treatment.
- Reduce the human suffering and socio-economic burden associated with TB.
- Protect poor and vulnerable populations from TB, TB/HIV and multidrug-resistant TB.

Targets

MDG 6, Target 8:……halted by 2015 and begun to reverse the incidence.

Targets linked to the MDGs and endorsed by the Stop TB Partnership:

- By 2005: detect at least 70% of new sputum smear-positive TB cases and cure at least 58% of these cases.
- By 2015: reduce prevalence of and death due to TB by 50% relative to 1990.
- By 2050: eliminate TB as a public health problem (<1 case per million population).

Components of the Stop TB strategy

1. Pursue high-quality DOTS expansion and enhancement

- Political commitment with increased and sustained financing.
- Case detection through quality-assured bacteriology.
- Standardized treatment with supervision and patient support.
- An effective drug supply and management system.
- Monitoring and evaluation system and impact measurement.

2. Address TB/HIV, MDR-TB and other challenges

- Implement collaborative TB/HIV activities.
- Prevent and control multidrug-resistant TB.
- Address prisoners, refugees and other high-risk groups and special situations.

3. Contribute to health system strengthening

- Actively participate in efforts to improve system-wide policy, human resources, financing, management, service delivery, and information systems.
- Share innovations that strengthen systems, including the Practical Approach to Lung Health (PAL).
- Adapt innovations from other fields.

4. Engage all care providers

- Public-public, and Public-Private Mix (PPM) approaches.
- International Standards for Tuberculosis Care (ISTC).

5. Empower people with TB, and communities

- Advocacy, communication and social mobilization.

- Community participation in TB care.
- Patients' Charter for Tuberculosis Care.

6. Enable and Promote research

Materials and Methods

IV

Materials and Methods

Materials

Disposable container, Bamboo thin stick, Microscope, Glass slides, Spirit lamp or lgnited cotton wool swab, Marker, Diamond pencil, Staining pan or rack, Slide stand, Slide box, Forceps, Clean soft cloth, Laboratory register book, Sprit lamp and Result slip.

Chemical Requirement for Sputum Smear Microscopy

Methylated sprit, Carbol-Fuschin, 20% Sulfuric acid, 0.1% Methylene blue solution, Immersion oil and Distilled water.

Method

A total of two hundred ninety sputum samples from clinically suspected TB patients attending Gorkha District Hospital were examined by Acid Fast staining by Ziehl-Neelsen (ZN) method. The study period was from 2063/3/18 to 2064/1/18 and study was designed in two phases.

(a) Questionnaire survey

(b) Sputum examination

(a) Questionnaire Survey

The study area was selected on the basis of present and past history of TB patients. A structured questionnaire was prepared basically focusing on KAAP including signs and symptoms of present and past history of TB. Questionnaire was pre-tested before administration.

(b) Sputum Examination

During the study period a total of 290 sputum samples of suspected person were collected and examined. Among them 161 were males and 129- females. The samples were collected from those patients who had following symptoms either one or all.

(a) Cough for four weeks or more

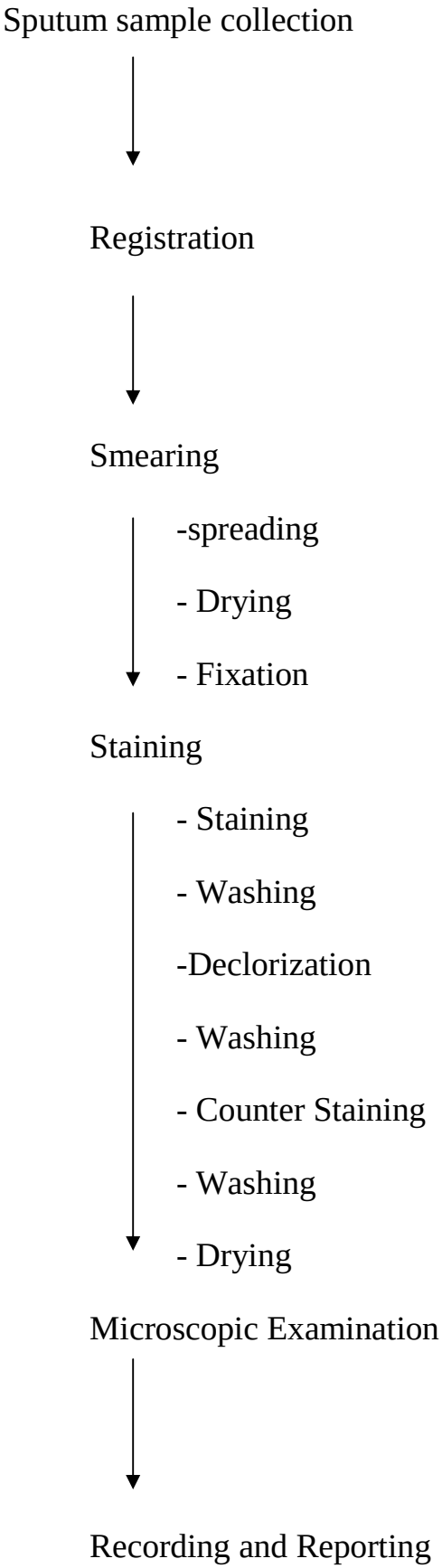
(b) Chest pain

(c) Fever

(d) Hamoptysis

The early morning sputum specimen represents to the pulmonary secretions overnight. Suspected persons were requested with the following instruction before collecting the sample: Gargle well to remove food remnants remaining in the mouth just before collection. Specimen collected should not be exposed to direct sunlight, as tubercle bacilli are highly sensitive. Disposable containers were used for sputum collection and they were cleaned. Sterilized, unbreakable, unleaked and wide mouthed and collected containers were labeled with the name of the persons or identification numbers with the marker them sealed thoroughly with collotape. The collected date specimen number and other information were recorded in the diary. The packed samples were carried out in laboratory of Gorkha District Hospital for sputum smear microscopy. The examination of sputum samples were carried out following the procedure given below in flow chart.

Flow Chart of Direct Sputum Examination



Smear Preparation

- Sputum specimen numbers were written on the edge of glass slide.
- A bamboo stick was broken into two pieces to make the edge rough.
- A small portion of yellowish particle of sputum was picked.
- It was spread to a size of approximately 2cm×3cm size with the help of bamboo stick.
- Dried it at room temperature completely.
- It was fixed passing through the flame 2-3 times about 5 seconds each.

Staining Procedure for ZN Staining

- Fixed smears were placed on a staining rack.
- Filtered carbol fuschin poured on to the slide.
- Ignited cotton - wool swab was used for heating the slides, until they steam, without boiling and allowed to stand for 3 minutes.
- After 3 minutes the slides were washed gently with tap water.
- The slides were then decolorized with 3% acid alcohol for 3 minutes.
- After 1 minute the slides were washed gently with tap water.
- The slides were decolorized with 3% acid alcohol for 3 minutes.
- After 1 minute the slides were washed gently with tap water.

- The slides were counter - stained with malachite green or methylene blue for 1 minute
- The slides were then washed gently with tap water.

Microscopic Examination

As systematic search of the stained smear is necessary, 300 visual fields (V-F) were examined before reporting as negative.

Recording and Reporting

The expressions of the amount of detected acid-fast bacilli were due to American lung association in USA.

Direct sputum smear microscopy reporting /grading scale.

ALA (Z-N Method)

Result

Negative	OAFB/300VF
+-	1-2 AFB/300VF
1^+	1-9 AFB/100 VF
2^+	1-9 AFB/10 VF
3^+	1-9 AFB/10 VF
4^+	> AFB/VF

PHOTO PLATE - I

a. Showing Gorkha Hospital

b. Interviewing the Respondents

c. Collecting Sputum Samples

RESULTS

V

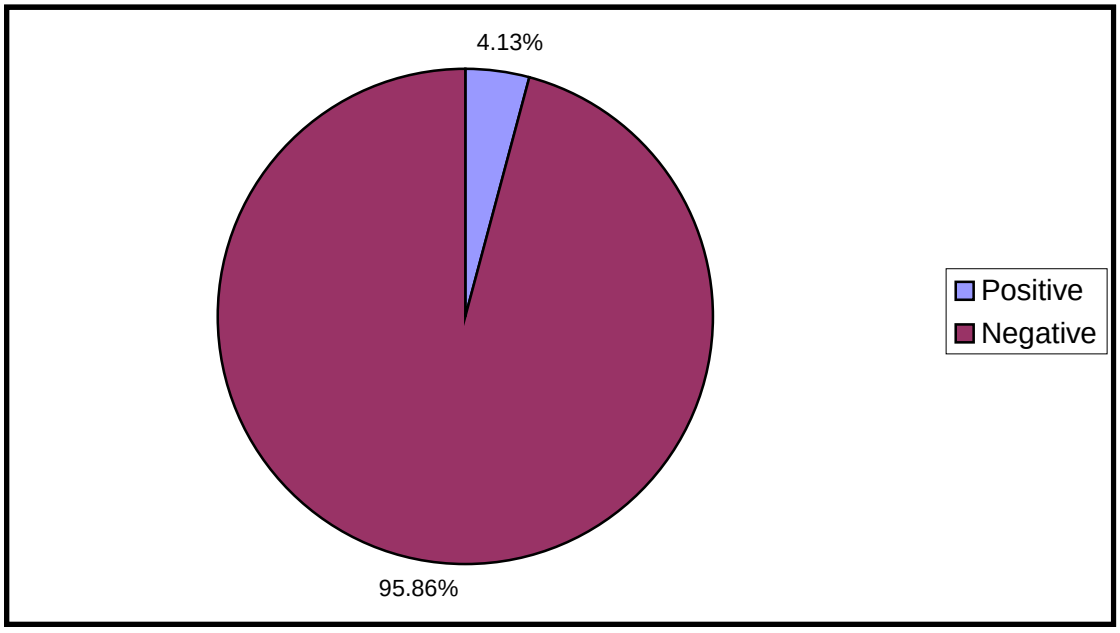
RESULTS

The study was conducted from 2063/09/18 to 2063/12/18 BS among suspected pulmonary tuberculosis patients visiting Gorkha District Hospital, Gorkha. A total of 290- sputum samples were collected, out of which 161 (55.5%) were of males and 129 (44.48%) were of females. Out of 290 sputum samples, 12 (4.13%) were positive and the remaining 278 (95.86%) were negative. Suspected patients visiting District Hospital were from different VDCs (Bakarang, Manakamana, Dhuwakot, Deurali, Shreenathkot, Manbu, Taklung, Namjong etc) and different wards of Prithive Narayan Municipality.

Table No. 5.1: General Prevalence of Pulmonary Tuberculosis in Suspected Cases Visiting Gorkha District Hospital

Total No. of Sputum Samples Examined	Positive Slides		Negative Slides	
	Total No	%	Total No	%
290	12	4.13	278	95.86

Graph No. 5.1: General Prevalence of Pulmonary Tuberculosis in Suspected Cases Visiting Gorkha District Hospital



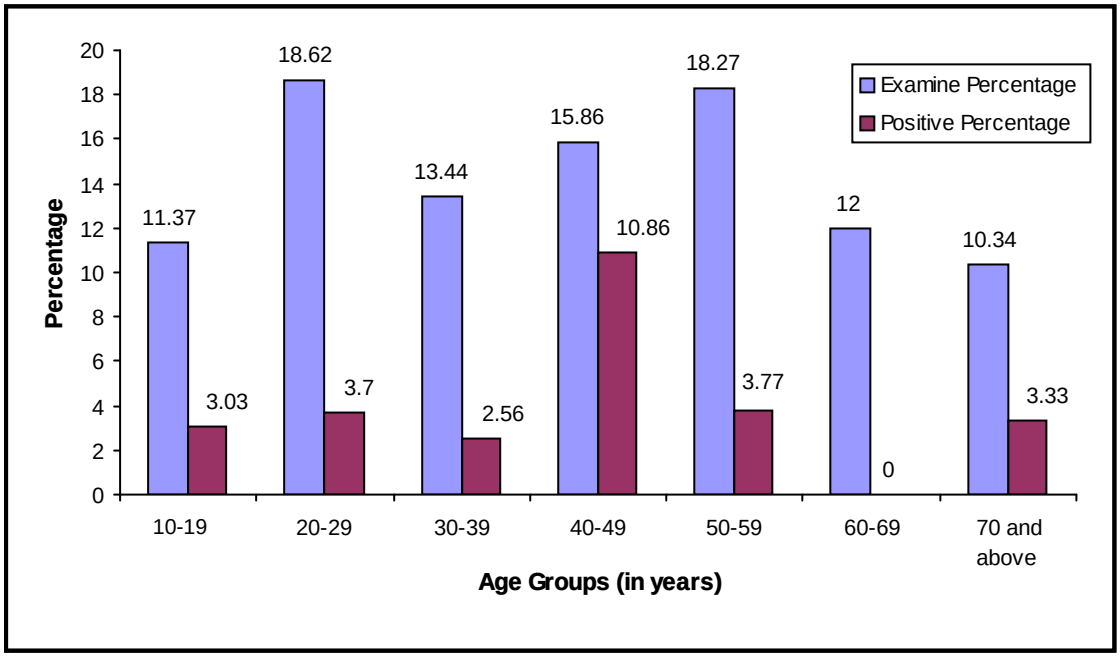
5.1.2 Age- Wise Prevalence of Pulmonary Tuberculosis

Out of 290 sputum samples examined, 12 were positive. Age-wise prevalence of positive cases showed that maximum, 5 (41.66%) cases were in 40-49 years age-group and no positive was found in 60-69 years age group. Statistically, as calculated ¡ ^{2} value is less than tabulated ¡ ^{2}, the null hypothesis is accepted. That is AFB positive in different age group is not significant.

Table No. 5.1.2: Age- Wise Prevalence of Pulmonary Tuberculosis

Age-group (in year)	Total examined	Percentage examined	No. of AFB Positive	Positive percentage
10-19	33	11.37	1	3.03
20-29	54	18.62	2	3.70
30-39	39	13.44	1	2.56
40-49	46	15.86	5	10.86
50-59	53	18.27	2	3.77
60-69	35	12.00	0	0
70 and above	30	10.34	1	3.33
Total	290	100	12	4.13

Graph No. 5.1.2: Age- Wise Prevalence of Pulmonary Tuberculosis



5.1.3 Sex-Wise Prevalence of Pulmonary Tuberculosis

Out of a total of 290 sputum samples examined, 161 (55.51%) were of males and 129 (44.48%) were of females. Out of 161 (55.51%) male sputum samples, 7 (4.34%) were AFB positive. Out of 129 (44.48%) female sputum samples, 5 (3.87%) were AFB positive. Hence positive case was found slight higher in males 7 (58.33%) than in females 5 (41.66%). As calculated value of ¡ ^{2} is less than tabulated value of ¡ ^{2} the null hypothesis is accepted, so the distribution of AFB positive case between male and female is statistically not significant.

Table No. 5.1.3: Sex-Wise Prevalence of Pulmonary Tuberculosis

Male				Female			
Total No. of sputum samples examined	%	AFB positive	Positive percentage	Total no. of sputum samples examined	%	AFB positive	Positive percentage
161	55.51	7	4.34	129	44.48	5	3.87

Graph No. 5.1.3: Sex- Wise Prevalence of Pulmonary Tuberculosis

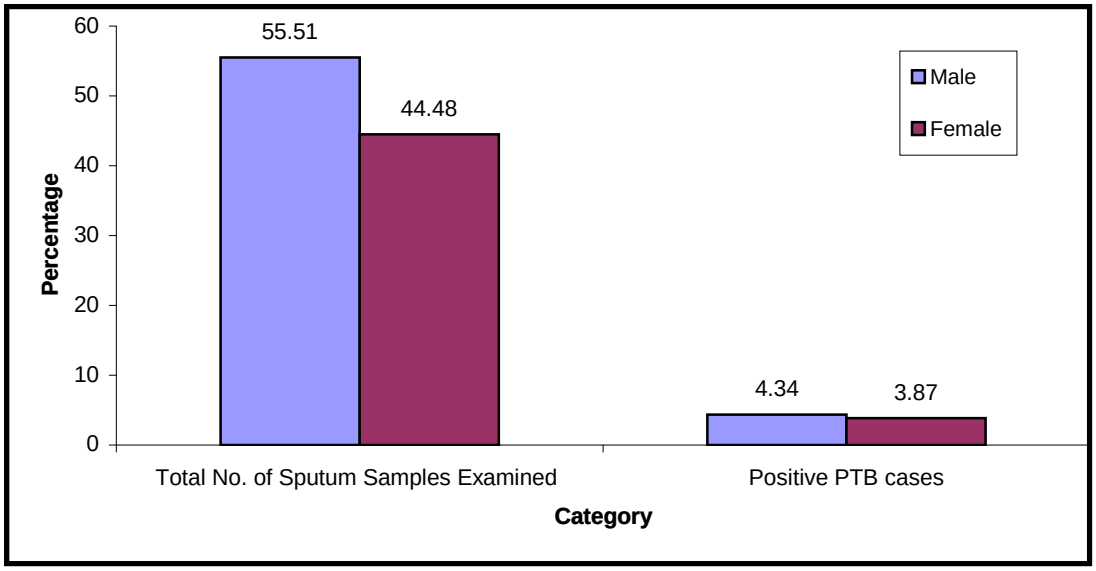


Table No. 5.1.4: Age and Sex Wise distribution of Pulmonary TB

Age group (in year)	Male			Female			Total		
	Total sputum smear examined	No. of sputum smear showing AFB positive	Positive %	Total sputum smear examined	No. of sputum smear showing AFB positive	Positive %	Total sputum smear examined	No. of sputum smear showing AFB positive	Positive %
10-19	10	1	10	17	0	0	27	1	3.70
20-29	29	1	3.44	18	1	5.55	47	2	4.25
30-39	26	0	0	15	1	6.66	41	1	2.43
40-49	24	3	12.50	23	2	8.69	47	5	10.63
50-59	30	2	6.66	20	0	0	50	2	4
60-69	22	0	0	18	0	0	40	0	0
70 and above	20	0	0	18	1	5.55	30	1	2.63
Total	161	7	4.34	129	5	3.87	290	12	4.13

5.1.5 Age -Wise Positive Cases and Grading

Altogether 12 cases of sputum were found positive for pulmonary tuberculosis. The positive cases were verified from (NTC) National Tuberculosis Center, Thimi in which 7, 3, 2 were first (1^+), Second (2^+) and third (3^+) grade scale respectively.

Table No. 5.1.5: Age - Wise AFB Positivity and Grading

Age-group (in year)	Total slides collected	Total positive	Grading		
			1+	2+	3+
10-19	2	1	1	1	__
20-29	47	2	1	1	__
30-39	41	1	1	__	__
40-49	47	5	3	1	1
50-59	50	2	1	__	__
60-69	40	0	__	__	__
70 and above	38	1	__	1	__

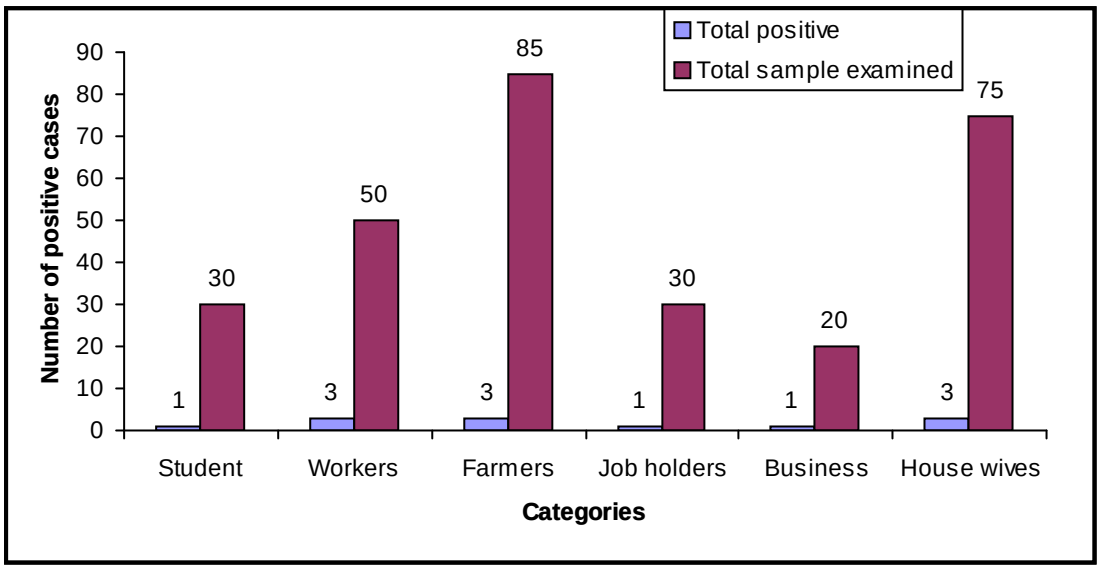
5.1.3 Occupation-Wise Prevalence of PTB

Out of 290 sputum samples, the highest positive cases 3 (1%) were found in house-wives. When categorized by the profession, of the 290 samples examined, 30 (10.34%) were students, 50 (17.24%) were workers such as weaver, tailor, painter, carpenter, cobber etc. 85 (29.31%) were farmers, 30 (10.34%) were job holders (nurse, teachers, army, security guard etc), 20 (6.89%) businessman and remaining 75 (25.86%) were house wives.

Table No. 5.1.6: Occupation-Wise Prevalence of PTB

S.N.	Occupation	Total sample examined	Male		Female		Total positive	Positive %
			Samples	Positive	Samples	Positive		
1	Student	30	20	1	10	0	1	0.34
2	Workers	50	40	2	10	1	3	1.03
3	Farmers	85	65	2	20	1	3	1.03
4	Job holders	30	21	1	9	0	1	0.34
5	Business	20	15	1	5	0	1	0.34
6	House wives	75	0	0	75	3	3	1.03
Total		290	161	7	129	5	12	4.13

Graph No. 5.1.4: Occupation-Wise Prevalence of PTB



5.2 Result Based on Questionnaire Survey

This sub-section shows the view about TB regarding knowledge, symptoms, mode of transmission, treatment, control and relationship with smoking habit.

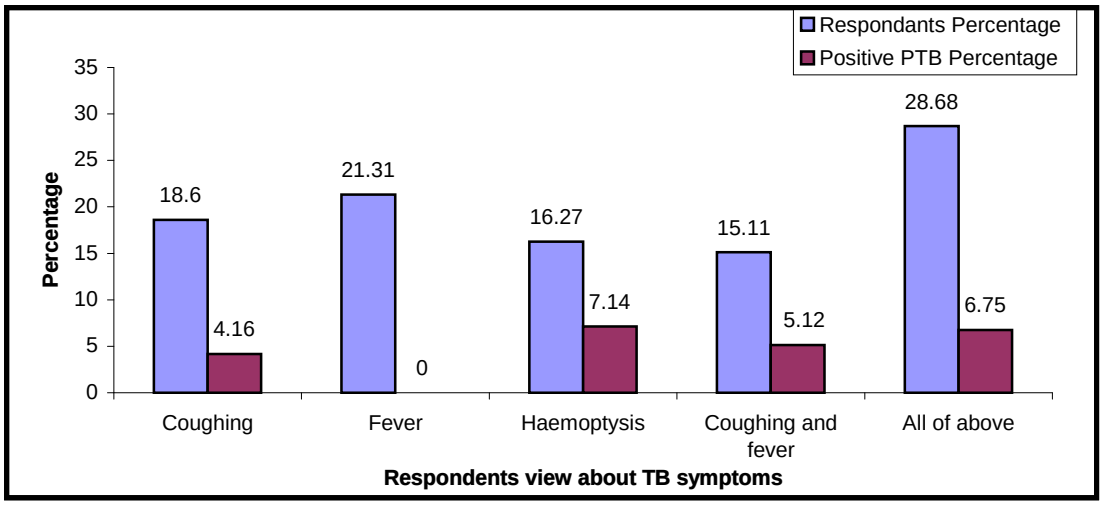
5.2.1 Knowledge of TB

A survey through a set of questionnaire was performed to the same lot of population whose sputum was examined. Out of 290 suspected cases, 258 (88.96%) had knowledge about tuberculosis and only 32 (11%) were unknown about it. Regarding knowledge of symptoms, 48 (18.60%) said it was coughing; 39 (15.11%) said coughing and fever, 55 (21.31) view was only fever, 42 (16.27%) said haemoptysis and 74 (28.68%) respondent said all the above mentioned were the symptoms. AFB positive was found maximum i.e. 5 in people having all the knowledge of symptoms.

Table No. 5.2.7: Views about Symptoms of TB

S. N	Category	Total No. of respondents knowing	Respondents No.	Percentage	Positive PTB	Percentage
1	Coughing	258	48	18.60	2	4.16
2	Fever		55	21.31	0	0
3	Haemoptysis		42	16.27	3	7.14
4	Coughing &fever		39	15.11	2	5.12
5	All of above		74	28.68	5	6.75

Graph No. 5.2.5: Views about Symptoms of TB


Respondants Percentage
Positive PTB Percentage
Percentage
35
30
25
20
15
10
5
0
18.6
4.16
21.31
0
16.27
7.14
15.11
5.12
28.68
6.75
Coughing
Fever
Haemoptysis
Coughing and fever
All of above
Respondents view about TB symptoms

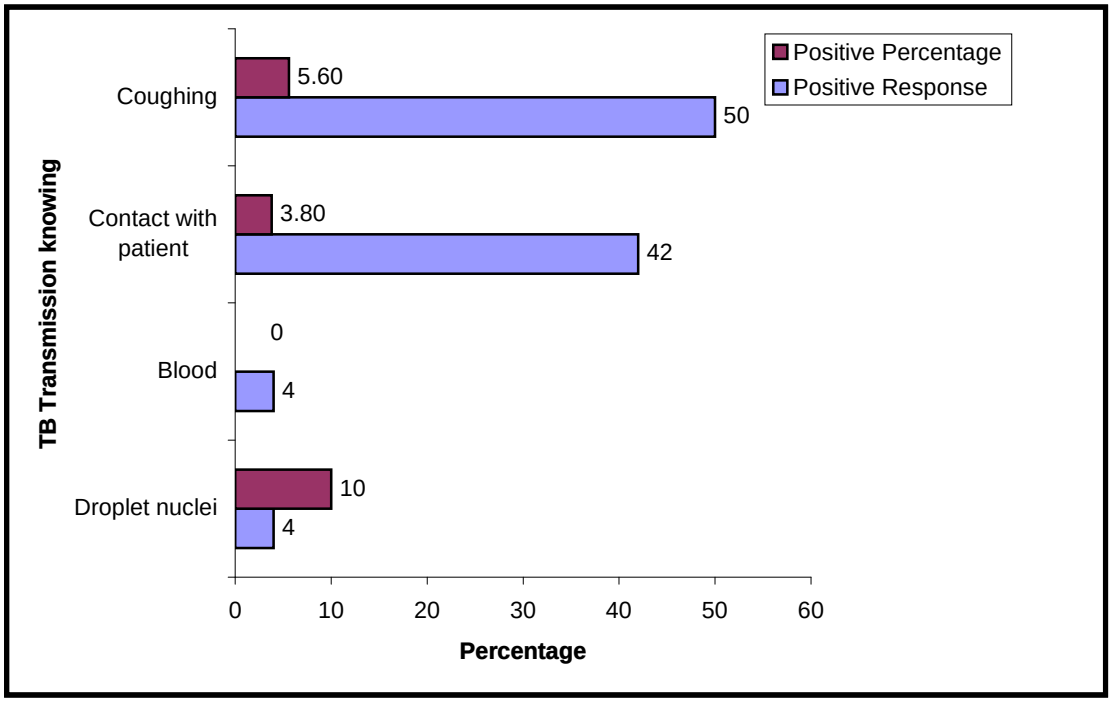
5.2.2 View about Transmission of TB

Out of total 290 respondents, 256 (88%) said that TB is an infectious disease. Among them 250 (97.65%) knew TB can be transmited from human to human. Among 250, 125 (50%) knew that TB transmits through coughing, 10 (4%) knew that TB transmits through droplet nuclei, 10 (4%) knew that TB transmits through blood and 105 (42%) knew that TB transmits through contact with patient, but very few respondents viz. 6 (2.34%) had no knowledge about transmission methods of TB.

Table No. 5.2.8: Knowledge about Transmission of TB

S.N	Category	Total No. of respondent	Respondents No.	Percentage	No. of PTB cases	Percentage
1	Droplet nuclei	250	10	4	1	10
2	Blood		10	4	0	0
3	Contact with patient		105	42	4	3.80
4	Coughing		125	50	7	5.60

Graph No. 5.2.6: Knowledge about Transmission of TB



5.2.3 Smoking Behaviour and Rate of PTB

The study revealed that 115 respondents (39.65%) were current smokers, 25 (8.62%) were former smokers and 150 (51.72%) were non smokers. Out of total 115 current smokers, 37 (32.17%) smoked between 5-8 cigarettes/ day, 45 (39.13%) smoked between 8-12 cigarettes/day, 18 (15.65%) smoked between 13-16 cigarettes/ day and 15 (13%) smoked more than one packet.

Among total current smokers, 70 (60.86%) were males and 45 (39.13%) were females. Out of total 115 smokers, PTB positive rate was found higher i.e.3 (2.60%) in 5-8 cigarettes per day smokers.

Table No. 5.2.9: Smoking Behaviour and Rate of PTB

S.N.	Sex	Smokers	PTB Positive	Positive percentage
1	Male	70 (60.86%)	5	7.14
2	Female	45 (39.13%)	2	4.44
3	Total	115	7	6 (out of 115)

Table No. 5.2.10: Smoking Behaviour and Rate of PTB

Smoking behaviour	Total respondents	Percentage of respondents	Positive cases for PTB (No.)	Positive %
Former smoker	25	8.62	0	0
Current smokers:				
5-8 cig/day	37	32.17	3	8.10
8-12 cig/day	45	39.13	1	2.22
13-16 cig/day	18	15.65	2	11.11
One packet	15	13	1	6.66
Non smokers	150	51.72	5	3.33
Total	290	100	12	4.13

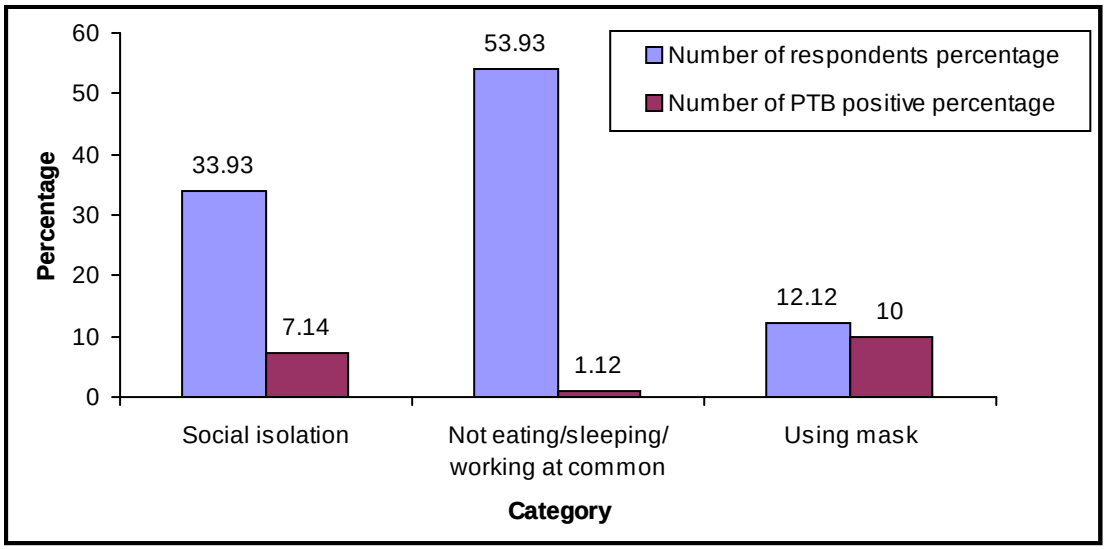
5.2.4 View about Preventive Methods

Out of 290 respondents, 165 (56.89%) knew that TB can be controlled by various preventive methods. Out of 165 respondents having knowledge of preventive methods gave different answers for preventive methods. 56 (33.93%) respondents responded that prevention of PTB can be made by social isolation, 89 (53.93%) said by not eating/ sleeping/ working with PTB patients; and 20 (12.12%) said by using mask, while the others 125 (43.10%) were unaware of it. Maximum positive cases i.e. 4 (2.42%) were found in the respondents having the view of social isolation for preventive methods.

Table No. 5.2.11: View about Preventive Methods and PTB Positives

S.N.	Respondents view	Total No. of respondent having knowledge of TB transmission method	No. of respondents having knowledge	%	Total No. of PTB positive	%
1	Social isolation	165	56	33.93	4	7.14
2	Not eating/sleeping/ working at common		89	53.93	1	1.12
3	Using mask		20	12.12	2	10

Graph No. 5.2.7: View about Preventive Methods



5.2.5 Treatment Methods

The survey showed that maximum no. of respondents 230 (79.31%) go for medical treatment to District Hospital, while some go to private clinics and a few believed in herbal treatment.

When the 12 TB positive cases were asked where they will have their treatment 7 of them replied DOTS clinic, 3 replied in private clinic and 2 had no idea. They were then suggested to go to DOTS clinic.

PHOTO PLATE - II

a. Preperation and Staning of Slides

b. Microscopic Examination of Slide

c. Showing *M. tuberculosis*

DISCUSSION AND CONCLUSION

VI
DISCUSSION AND CONCLUSION

Tuberculosis (TB) has become a grave concern in all parts of all world because of recent resurgence of TB. Reasons of this resurgence have been identified by WHO as mainly due to HIV pandemic, less health priority given to the disease and significant increase of multidrug resistant tubercle bacilli as a result of inadequate treatment. The causative agent was discovered more than 100 years ago and highly effective drugs and vaccine are available making TB a preventable and curable disease. It remains as the most significant cause of morbidity and mortality due to a single infectious agent in the world.

In Nepal, for the diagnosis of tuberculosis mainly used method is chest x-ray, direct sputum smear examination by microscopy and tuberculin test, only a few hospitals have facilities for *Mycobacterium* culture and antituberculosis drug sensitivity test. In the Gorkha District Hospital, the study area sputum smear examination by microscopy for AFB andChest X-ray is done.

During this study, 290 sputum samples were collected from the suspected pulmonary tuberculosis cases visiting Gorkha District Hospital, 12 were acid-fast bacilli (AFB) positive. Out of 12 AFB positive, 7 were males and 5 were females. Thus males were found to be infected more than female.

Similarly, in 1994, Smith *et al.,* found that higher prevalence of infection in males than females from tuberculin survey carried out in Gorkha district. Smith (1996) also reported that like in most countries of the world, in Nepal, also the reported incidence of TB is higher in men than women. Shrestha (1989) reported (47%) of male and (3.05%) of female

TB cases in histopathological specimens at Tribhuvan University Teaching Hospital.

Age wise observation of the smear showed that maximum number of AFB positive smear among the 20-49 years age group followed by older age groups. Among the 12 positive cases, 8 (66.66%) were from 20-49 years age group. This showed that majority of TB patients are in productive age group. Pandit (1997) stated that seventy percent of TB deaths are in the economically productive (15-50) age group. In this age group, many persons smoke and drink excessively and migrate to different places for jobs, this increases the susceptibility for TB.

Table no. 5.2.1 shows occupation wise of PTB. According to which, pulmonary TB was higher in workers, farmers and house-wives. Similarly, Lifson *et al.*, (1999) stated the risk of tuberculosis is greater in areas of residence characterized by crowding, poverty and lower education.

Three possible factors could explain the gender differences regarding TB infection. The most commonly accepted being that women are less exposed to infection than men. The second might be biological difference, increased susceptibility in males. Finally infected women may progress more frequently to disease and die more rapidly, leaving a cohort with low prevalence of infection.

The knowledge and symptoms of TB were observed. Further (88.96%) had knowledge about tuberculosis and only (11%) were unknown about it. Among the 258 samples, 48 said it was coughing, 39 said coughing and fever, 55 view was only fever, 42 said haemoptysis and 74 respondent said all the above symptoms. Maximum AFB positive was found i.e. 5 in people having all the knowledge of symptoms. Similar type of result were found by Joshi *et al.*, (2003) the study conducted in

Patan Hospital. Both studies indicate most of the respondents support all of the above symptoms.

Table no. 5.4.1 clearly shows that the 256 (88%) said that TB is an infectious disease. Among them 6 (2.3%) had no idea about TB transmission and remaining had good knowledge about TB transmission, 10 (4%) respondents viewed droplet nuclei, 10 (4%) knew that TB transmits through blood whereas 105 (41.1%) viewed contact with patient and only 125 (50%) knew that TB transmits through coughing. Joshi *et al.,* (2003) similar type of study was conducted TB patients visiting in DOTS clinic in Patan Hospital. Out of total 58 patients 44 (75.86%) said that TB is an infectious disease. Their views regarding the transmission of TB are, 1 (2.27%) respondents viewed Blood, 2 (75.86%) said that TB is an infections disease. Their views regarding the transmission of TB are, 1 (2.27%) respondents viewed Blood, 2 (4.55%) knew that TB transmits through contact, 32 (72.73%) said that TB transmits through coughing whereas 2 (4.55%) knew that TB transmits through coughing and Blood. Only 7 (15.91%) said that TB transmits through coughing and contact. Both study shows that majority of responded sport TB is infections disease and transmet through coughing.

The study found that 115 (39.65%) were smokers and 175 (60.34%) were non-smokers among 290. Out of the total 115 (39.65%) smokers, 37 (32.17%) were smokers who smoked 5-8 cigarettes per day, 45 (39.13%) smoking between 8-12 cigarettes per day, 18 (15.65%) smoking between 13-16 cigarettes per day and 15 (13%) smoking one packet per day. In an indentical study carried out by *Jha et al.,* (1999) in Sunsari district of Nepal among the 8643 randomly selected participants found 17.5% smokers. Out of total smokers, (11%) smokers smoked more than 20 cigarettes per day and 42% were smoking from more than 20 years.

Regarding smoking habit, the study showed that 70 (60.86%) smokers were males and 45 (39.13%) were females. According to the significance test, smoking habit in males and females was found to be statistically significant. Similarly study done by Karki (1993) showed that among 203 smokers, 163 (80.30%) were males and 40 (19.70%) were females. However he didn't show that results of significance between smoking habit and sex.

The study obtained that among the total of 290 suspected cases, 115 (39.65%) were current smokers, 25 (8.62%) were former smokers and 150 (51.72%) were non smokers. Out of total 115 smokers, 7 patients had pulmonary tuberculosis and out of 150 (51.72%) only 5 had pulmonary tuberculosis. Similar study by Subedi (1985) on tobacco smoking and its effects on lung among the 1336 patients attending in chest department of Tri-Chandra Military Hospital showed that 885 (66.24%) were smokers and 451 (33.75%) 431 (48.7%) had pulmonary tuberculosis and out of 451 non-smokers, 168 (37.28%) have bad pulmonary tuberculosis.

Karki conducted a study in 1993 for prevalence of alcohol, 'Khaini' and smoking habits in Nepalese population. Persons smoking currently were considered as smoker. Those person who have never smoked in their life were non-smoker, similar criteria were applied for 'Khaini' and alcohol consumption. Among 203 smokers, 163 were male and 40 were female among 262 alcohol consumption, 225 were male and 37 were female, among 126 'Khaini' chewing person, 116 were male and 10 were female. The smoking habit higher male than female. Similar our study shows that smoking habits were higher in male 70 (60.86%) than female 45 (39.13%).

Short - course treatment is currently the most effective treatment for most patients with TB, and direct observation helps many patients to complete

the 6-8 month treatment regimen. Treatment with an effective short course chemotherapy regimen rapidly renders the patients non-infections and therefore breaks the cycle of transmission. Results of DOTS have been impressive. China has reported cure rates in excess of 80% in more than 100,000 patients since introducing DOTS (China TB collaboration, 1996). Similarly 86.6% of success rate was calculated in Nawalparasi district, Nepal 1996-1999 (Osuga, 2000).

Two hundred and Ninty samples from suspected tuberculosis patients, attending Gorkha district Hospital were examined. Out of the total samples 161 samples were obtained from males and 129 samples from females. Highest percentage (4.34%) of pulmonary Tuberculosis was obtained from males and also greater prevalence of TB in middle age group or productive age group (20-49) years.

Direct observed Treatment short course (DOTS) is a short course of chemotherapy used to cure the tuberculosis patients. Regarding treatment pattern, most of the patients 10 (83.33%) believe in medical treatment, in which 7 (70%) went to DOTS center, 3 (10%) visited private clinics but 2 had no idea of treatment.

PHOTO PLATE - III

a. Interaction with District Health Officer

RECOMMENDATIONS

VII

RECOMMENDATIONS

Conclusion of this study suggests the following recommendations.

1. As this study was confined in Gorkha District Hospital, Gorkha, it does not necessarily reveal the total picture of whole district therefore this type of study should be carried out throughout the year covering wide geographical region in order to obtain most reliable information of geographical distribution and ethnic variation of disease.
2. Expand Directly Observed Treatment Shorts Course (DOTS) to all the TB patients and in all the areas of the district.
3. Rapid and accurate methods should be adopted for preventing TB disease with the use of preventive therapy in individuals with latent TB infection in programmatic efforts of control, prevent and eliminate the TB disease.
4. Most of the people are illiterate, so community health education about tuberculosis should be provided to all areas of district.
5. People awareness program related to practices and transmission of disease should be included in mass media regularly by campaign and rally.
6. TB infected persons should be well treated and friendly behaved.

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ANNEX - I

ANNEX - I

Questionnaires for the Hospital Visiting Patients

I. Indemnification of the Patients:

Name: **Age:** **Sex:**
Educational Status:
Illiterate/ Literate: **Occupation:** **Residence:**

2. Do you know about TB?

(a) Yes ☐ (b) No ☐

3. If yes, what are the symptoms of TB?

(a) Coughing ☐ (b) Fever ☐

(c) Haemoptysis ☐ (d) All of them ☐

4. Do you think TB is infectious disease?

(a) Yes ☐ (b) No ☐

5. If yes, how does it transmit?

(a) Droplet nuclei ☐ (b) Blood ☐

(c) Contact with TB Patient ☐ (c) Coughing ☐

6. Where do you go for treatment, if you have TB?

(a) HP ☐ (b) PHC ☐

(c) Hospital ☐ (d) Private clinic ☐

7. Had any body in your family have TB attack recently?

(a) Yes ☐ (b) No ☐

8. Do you think TB transmission be prevented?

(a) Yes ☐ (b) No ☐

9. What are the preventive measures?

(a) Social isolation ☐

(b) Not eating /sleeping (working at common) ☐

(c) Using mask ☐

10. Do you smoke?

(a) Yes ☐ (b) No ☐

(c) Currently ☐ (d) Former ☐

ANNEX - II

नेपाल सरकार
स्वास्थ्य मन्त्रालय
स्वास्थ्य सेवा विभाग
पश्चिमाञ्चल क्षेत्रीय स्वास्थ्य निर्देशनालय
जिल्ला स्वास्थ्य कार्यालय
गोरखा अस्पताल
गोरखा

☎ ०६४-४२०२०८

चलान पत्र संख्या : ०६६/०६७
पत्र संख्या :
चलानी नं. : ६०

गण्डकी अञ्चल
मिति : २०६६।३।२८

विषय :- Reaserch work सुरु गरेको सम्बन्धमा ।

श्री केन्द्रीय क्याम्पस प्राणिशास्त्र,
त्रि. वि. कीर्तिपुर ।

उपरोक्त विषयमा केन्द्रीय क्याम्पस (प्राणीशास्त्र) त्रि. वि. कीर्तिपुर क्याम्पसबाट आउनु भएका श्री शान्ती कुमारी झाले मिति ०६६।३।२८ गते देखी ३ तिन महिनाको लागी यस गोरखा अस्पतालको रि. वि. [illegible]मा आफ्नो Reaserch कार्य सुरु गर्नु भएको व्यहोरा जानकारीको लागी अनुरोध गरीन्छ।

(डा० किरण शर्मा)