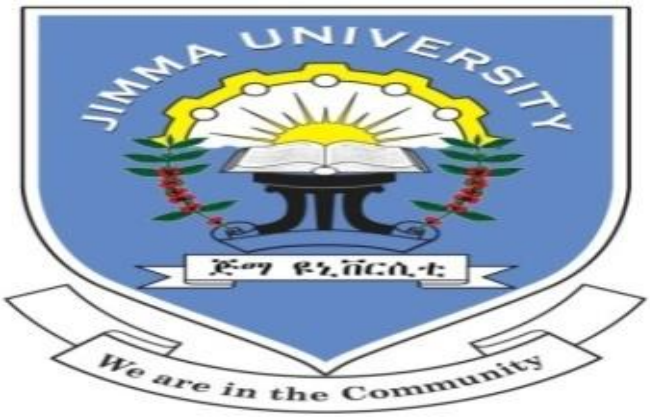
PREVALENCEOF SMEAR POSITIVE PULMONARY TUBERCULOSIS AMONG PATIENTS VISITING BEDELE TOWN HOSPITAL, ILLUBABOR ZONE, OROMIA REGION, SOUTH WEST ETHIOPIA



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PREVALENCE OF SMEAR POSITIVE PULMONARY TUBERCULOSIS AMONG SUSPECTED PATIENTS VISITING BEDELE TOWN HOSPITAL, ILLUBABOR ZONE, OROMIA REGION, SOUTH WEST ETHIOPIA

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SUMMARY

Background: - Tuberculosis is one of the public health problems in the world.One third of the world population is infected with the latent form of tuberculosis. Tuberculosis is greatest killer worldwide due to single infection next to HIV. Ninety-five percent cases and 98% deaths due to TB occur in developing countries especially in East Asia and Sub-Saharan Africa.

Objective: - To determine the prevalence of smear positive pulmonary tuberculosis among suspected patients attending at Bedele hospitallaboratory during the study period.

Method: - A cross –sectional study design will be conducted in Bedele hospital from 20/02/2016 to 5/03/2016. All sputum samples from all suspected patients of pulmonary tuberculosis will be collected in the study period. Sputum sample will be collected, up to three specimen may need to be examined to detect M-TB in sputum, one specimen should be collected as an early morning sputum.And examined for Acid fast bacilli (AFB) using Zeihl Nelson staining method.The ziehel-Nelson (Zn) technique is used to stain mycobacterium species, including M. tuberculosis, M. ulcerans and M.leprae. Mycobacterium, unlike most other bacteria, do not stained with carbolfuchin combined with phenol. The stain binds to the mycolic acid in the mycobacterium cell wall. After stainig, an acid decolorizing solution is applied. This remove the red dyes from the background cells, tissue fibers and any organisms except mycobacterium which retain (hold fast to) the dye and are therefore reffered to as acid fast bacilli (AFB) following decolorization the smear is counter stained with malachite green or methylen blue which stain the background material, providing a contrast colour against which the red AFB can be seen.then examine microscopically.Socio demographic and risk factor data will be collected by using questionnaires.

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ABBREVIATION AND ACRONYM

AFB - Acid Fast Bacilli

AIDS - Acquired Immune Deficiency syndrome

DOTS - Direct Observation treatment short course

HIV - Human Immune deficiency Virus

HC - Health Center

MOH - Ministry of Health

MTB - Mycobacterium Tuberculosis

MDRTB - Multiple any Resistance Tuberculosis

PTB - Pulmonary Tuberculosis

TB - Tuberculosis

WHO - World Health Organization

ZnStain- Ziehl Nielsen stain

OPERATIONAL DEFINITION

Illiterate: - one who cannot read and write

Infectious disease= called communicable disease or contagious disease any Disease that can transmitted from one person to another Physical contact or inhalation of droplet etc

Literate= one who can read and write

New case: - patient who has never been treated for tuberculosis, who has taken anti tuberculosis less than one month.

Prevalence: - a measure of total number of existing cases or event of to disease at a specified point of time.

PTB Suspect: - Patients presenting with clinical features to PTB such chronic cough, weight loss, fever, night sweating, chest pains, which makes the health worker think the patient may have PTB and requires to for sputum AFB examination

Relapse case: - a patient previously declared cured but with a new episode of symptom of disease and bacteriological positive (sputum smear or culture) of TB.

Risk factor: - condition which is its presence increase the probability that the disease occurs in the time future.

Smear (sputum) negative: - Absence of at least three AFB or sputum Microscopy

Sputum smear positive: - when there are at least two AFB positive results of sputum examination.

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CHAPTER –ONE

INTRODUCTION

1.1. Back Ground information

Tuberculosis (TB) remains a major global public health problem. It is estimated that about one-third of the world's population is infected with Mycobacterium tuberculosis. There were an estimated 9 million new cases of TB, resulting in 1.5 million deaths, with the greatest burden of disease in developing nations [1]. The genus Mycobacterium consists of non motile, non spore-forming aerobic acid-fast bacilli. The cell wall is lipophilic and resistant to many disinfectants as well as to common laboratory stains. Currently, more than 70 species of Mycobacterium have been identified, many of which are associated with human diseases [2].

M-TBis an intracellular pathogenic bacterium with complex lipid rich cell wall which makes it resistant to most antimicrobial agent and need long term treatment (3). M-TB is a fairly non motile rod shape bacterium. The rods are 2-4 µm in length and 0.2-0.5µm in width, and are an obligate aerobe. M-TBis not classified as gram positive or gram negative, but acid fast. Under ZiehlNeelson stain acid fast bacilli appear red or pink with blue background. The major determinant of M-TBvirulence is its cell wall which composed of peptdoglycan and lipid complex. The lipid complex consists of mycolic acid, cord factor and wax-D which account 60% cell wall (4).And it is fastidious slow growing bacteria which required up to 8 week to be detected in the laboratory culture (5).

Although MTB affect any parts of the body, typically it has high affinity to lung. People acquire MTB infection by inhalation of air contaminated with MTB bacteria. Patients with active PTB have high intensity to transmit the agent to other person (4,5).

Tuberculosis (TB) is a chronic infectious diseas. It typically affects the lungs (PTB) but can affect other parts of the body as well (extra pulmonary TB). The disease is spread via droplet infection when people with pulmonary TB expel

the bacilli while coughing, sneezing, talking, etc. Without treatment, mortality rates are high. Treatment using combinations of anti-TB drugs, developed in the 1940s and 1950s, can dramatically reduce mortality rates (5). Most of TB infection cases are asymptomatic and few of cases progress to active PTB. As it affects any parts of the body TB has a wide range of symptom. The followings are the classical symptom of PTB infection: chronic cough, blood tinged sputum, fever, night sweat, weight loss etc (4,5).

There are several methods for the diagnosis of TB. This include chest X-ray, microscopic (AFB), culture which is fundamental for diagnosis as well as sensitivity testing and serological test. Among those microscopic (AFB) is routine in developing countries such as Ethiopia because of its simplicity and cost (6).

TB is preventable and completely curable disease if correct management and drugs or treatment has taken for the correct length of time. Unless it is changed to MDR TB strain, the first line drugs are effective to cure TB (5,7).

1.2. Statement of the Problem

Tuberculosis is still a major public health problem in the world. According to the global epidemiology of the disease, one third of the world population are infected with M. Tuberculosis and one new infection occur per seconds in spite of not all changed to active PTB. (4, 5, 6). During 20^{th} century TB killed approximately 100 million people worldwide(4, 6).

Tuberculosis (TB) is a major global health problem. It causes ill-health among millions of people each year and ranks alongside the human immunodeficiency virus (HIV) as a leading cause of death worldwide.(2)

Approximately one third of the 34 million people living with HIV/AIDS worldwide are co-infected with latent TB. Studies shows that people livening with HIV and infected with latent TB are 21-34 times more likely to develop active PTB than people without HIV (4,6).

The report conducted by WHO in 2006 to assess the distribution of TB cases showed that Africa region (24%), south Asia region (35%) and western pacific region (24%) together accounts 83% of all notified new and relapse cases of TB. The global world report in 2008 indicates that a total of 202 countries and territories reported TB as 9.2 million new cases of TB around 2.5 million smear positive were close to Africa, South east Asia, and west of pacific (7).

In 2014, TB killed 1.5 million people (1.1 million HIV-negative and 0.4 million HIV-positive). The toll comprised 890 000 men, 480 000 women and 140 000 children. TB now ranks alongside HIV as a leading cause of death worldwide. HIV's death toll in 2014 was estimated at 1.2 million, which included the 0.4 million TB deaths among HIVpositive people.1 Worldwide, 9.6 million people are estimated to have fallen ill with TB in 2014: 5.4 million men, 3.2 million women and 1.0 million children. Globally, 12% of the 9.6 million new TB cases in 2014 were HIV-positive(3).

The number of incident TB cases relative to population size (the incidence rate) varies widely among countries. The lowest rates are found predominantly in high-income countries including most countries in western Europe, Canada, the United States of America, Australia and New Zealand. In these countries, the incidence rate is less than 10 cases per 100 000 population per

year. Most countries in the Region of the Americas have rates below 50 per 100 000 population per year and this is the region with TB affects all age groups and both sexes, but there are groups more vulnerable to develop the disease. Risk factor such as poverty, malnutrition, overcrowded living condition, and defective immunity are highly associated for increment of TB cases. The age group mainly affected of between 15 and 45 years (8).

According to the WHO Global TB Report 2009 (used as background document for the development of this study protocol), Ethiopia ranked seventh in the world for TB burden and third in Africa in 2008, with an estimated TB incidence (all forms) of 378 new cases per 100,000 persons, 163 new smear positive cases per 100,000 persons, and a prevalence (all forms) of 579 per 100,000 population (9). Following an update to estimates for TB cases and deaths in the African Region, the most recent WHO estimates for Ethiopia are: annual TB incidence (including HIV positive) of 261 per 100,000; prevalence (including HIV positive) of 394 per 100,000 and mortality (excluding HIV) of 35 per 100,000 people (4). In the year 2009/10 Ethiopia registered 146,172 cases of TB. Among these, 139,261 were new cases; 46,132 new smear-positive (33.1%); 49,037 new smear-negative (35.2%); 44,092 new extra-pulmonary TB (31.6%) (14).

Currently Ethiopia is one of the 22 high burden countries and remains one of the leading couses of mortality. According to WHO 2014 report, the prevalence and incidence of all forms of TB are 211 and 224 per 100,000 people .about 13% of all new TB cases are also HIV infected, moreover Ethiopia is are of the high TB/ HIV and multi drug resistance burden country. Nationally the TB incidence rate has fallen to 224 per 100,000 of the population in 2013 compared 369 in1990 (7)

More people in developing countries contract TB because of compromised immunity largely due to high rate of HIV infection and the development of AIDS. The current rigid rise of TB cases in Ethiopia is also partially due to epidemics of HIV/AID. The other problem for the management of TB, is the development of MDR-TB and these is usually due to the result of patient missing of dose drugs and incomplete course of treatment. Treatment of MDR -TB cases must be done based on the sensitivity testing; it is impossible to treat such patients without the drug sensitivity information(9).

According to WHOthere are 27 high burden countries for MDR TB. These are countries where at least 4000 cases of MDR-TB each year and at least 10% newly registered are MDR-TB and Ethiopia ranked at ninth (9^{th}). In 2009 there were estimated 9.7million children who were orphan as a result of their parents dying by TB (7).

Early diagnosis of the disease and prompt treatment is essential for an effective and efficient TB control program. Delay in diagnosis may worsen the disease, increase the risk of death, and increase the chance to transmit the agent to community etc. Studies in Africa shows that patients and health care delays are the major problem in the control of TB (1).

CHAPTER –TWO

2.1 LITERATURE REVIEW

In 2014, there were an estimated 9.6 million incident cases of TB (range, 9.1 million–10.0 million)3 globally, equivalent to 133 cases per 100 000 population The absolute number of incident cases is falling slowly at an average rate of 1.5% per year 2000−2014 and 2.1% between 2013 and 2014. The cumulative reduction in the TB incidence rate 2000–2014 was 18%. Most of the estimated number of cases in 2014 occurred in Asia (58%) and the African Region (28%);4 smaller proportions of cases occurred in the Eastern Mediterranean Region (8%), the European Region (3%) and the Region of the Americas (3%). The 22 HBCs that have been given highest priority at the global level since 2000 accounted for 83% of all estimated incident cases worldwide (1).

In 2014, there were an estimated 1.2 million deaths due to HIV; this includes 0.4 million deaths from TB among HIV-positive people (2)

In 2007 there were an estimated 13.7 million chronic active cases of TB worldwide while in 2010 there were an estimated 8.8million new cases and 1.5 million associated death mostly occurring in developing countries. The absolute case of TB has been decreasing since 2006 (15).

Tuberculosis is continues to be an important health problem worldwide in both morbidity and mortality. PTB is the commonest form of disease in about 80% of patients, extra-pulmonary which affects organs other than lungs such as, nerves system, lymph nodes, and joints etc account about 20% of all TB patients(15).

A prevalence survey study for smear positive TB in Thailand, Thai prison in 2007 shows that of 71594 prisoners, 22132(30.9%) were identified as TB suspects, and 254(1.2%) were confirmed by sputum smear for TB. In this study males were most lively diagnosed with TB disease (16).

A study conducted in central India in 2009, the prevalence of PTB shows that of 2341 individual eligible for screening 297(7.9%) were positive for PTB. The overall prevalence of culture and smear positive PTB was 387(95% CI: 273-502) per 100,000 population. The prevalence of PTB increase with age and significantly higher among males: 444/100,000 (95% cl: 415-693) as compared to female: 233/100,000(95%cl: 101-346) P<0.001. (15) Similar community based cross-sectional survey conducted in Central India, Jobalpur District in 2012 about the prevalence of PTB shows that out of 7533 individual who were symptomatic and submit sputum sample, 221 (2.93%) were positive for PTB. This study reveals that the prevalence of PTB was higher among male and rural area (17).

According to the study conducted in Brazilian prison in 2005 to determine the prevalence of PTB and to assess the performance of several screening strategies, the overall prevalence of TB cases was 4.6% (19).

A prospective study conducted in France, Paris about the prevalence and clinical predictor of PTB from August 2005 to January 2007, shows that of 134 patients isolated on admission to the ward for suspicious of PTB 26(19.4%) were positive for PTB. According to the study, PTB was significantly associated with young age, HIV infection, weight loss and upper lobe disease (20).

A study conducted in 2010 in pokhara, kaski, and Nepal showed that of the 62 HIV infected drug user PTB was diagnosed in 3(4.8%) of participant. All of them were male in productive age group. Cough was the major clinical symptoms (54.8%) in the study participant (22).

A retrospective study conducted in Nigeria between 2006 -2008 showed that of 3679 participants who were attending in infections disease hospital (IDH) in INKANO 541(14.7%) were positive for TB. In this study the age group 30-43 years had the highest prevalence. Nigeria has been ranked as the third TB affected nation in the world (22).

According to the study conducted about PTB among women with cough in Tanzania, Dar Es Salaam in 2009 shows that out of 616 TB suspects, 14(2.3%) were smear positive (21).

A cross-sectional survey conducted in 2009 in 18 prisons in Malawi to determine the prevalence of PTB shows that of 7714 individuals who have cough $\geq$ 1 week duration and submit sputum 54 (0.7%) had smear positive PTB. The prevalence of PTB was higher in larger urban prison (1.1%) than in district prison (0.3%) with $p<0.001$ (24).

Similar retrospective study conducted in Ghana, Tamale teaching health hospital from January 2004 to December 2010 to determine the prevalence of TB, shows that out of a total of 4720 recorded new cases, 620 were smear positive yielding positivity rate 13.0%. The positivity rate of year-on-year bases was 15.7%(2004), 15.8%(20050, 13.4%(2006), 12.7%(2007), 20.6%(2008), 10.0%(2009) and 6.3%(2010) (23).

In Ethiopia in 2002 the TB and leprosy control program had registered 94, 957cases of PTB from the DOTS implementing areas, among which 33,028 were new smear positive PTB cases. For the entire country the case notification rate of all forms were 173 per 100,000 population and new smear positive case were 60per 100,000population (25).

Of 16695 adult participants in 2006 in rural district of Ethiopia, 436(2.6%) were symptomatic for TB and submitted sputum sample for AFB and 13(3%) were positive for AFB and 13(3%) were positive for AFB. There were 34 smear positive cases identified through the existing health care delivery on ant-TB medication at the time of survey. The ratio of smear positive on treatment to those newly detected by the survey was 2:1 (26).

A retrospective study conducted about the prevalence of PTB in South East Ethiopia, Oromia region Agaro Teaching Health Center from 2005/6-2009/10 for five years shows that prevalence of smear positive PTB was 10.9% on the other hand the percentage of smear positive PTB shows gradual decrease from 19.8% in 2005/6 to 5.8% in 2009/10 (27).

A study conducted in Eastern Ethiopia prison in 2011 shows that of 371 suspected participant identified by active screening 33(8.9%) were confirmed as smear and culture positive for PTB. According to this study factors significantly associated with PTB were young age (15-44), urban

residence, having cough for greater than 4 weeks, sharing cell with TB patients or prisoner with chronic cough. (28).

Other study conducted in Northeast Ethiopia in 2012 showed that out of 400 participant 30(7.5%) (95% CI: 5.2-10.6%) were found to have PTB. Of these 19(63%) cases were co-infected with HIV (30).

Study conducted in BedeleWoreda Prisoners, Southwest Ethiopia Out of 196 prisoners screened for pulmonary tuberculosis(PTB), 43(21.9%) of the prisoners were positive for AcidFast Bacilli (AFB). The minimum and maximum age was 18 and 80 respectively. The age group 15-24, 19(44.2%) was themost affected age group. Most of the Acid Fast Bacilli (AFB)positive prisoners were male which accounts about 42(95.3%). In relation to the origin of the prisoners, 29(67.4%) of them were come from rural and the duration of the majority of the prisoners in the prison who were positive for AFB, 34(79.1%) were less than one year (32).

2.2 Significance of the Study

As it is clearly described in the statement of problem and literature review, reports on the prevalence of PTB is high in developing countries like Ethiopia. This study can provide information about the prevalence of PTB infection in Bedele town and surrounding community. Also it may provide current information on the prevalence of PTB to the concerned governmental and service institution and describe socio-demographic characteristic of the infection. Furthermore this study initiates other researchers on the topic to determine the magnitude of the problem and implement solution to reduce.

CHAPTER- THREE

OBJECTIVE

3.1. General Objective

- To determine the prevalence of smear positive PTB among patients attainingBedele hospital laboratory during the study period.

3.2. Specific Objective

- To determine the magnitude of smear positive PTB
- To determine the socio-demographic characteristic o PTB infected patients.
- To assess the association between PTB and socio-demographic variable.

CHAPTER- FOUR

METHOD AND MATERIALS

4.1. Study Area and Period

This study will be conducted in Bedele town hospital, serves a total population of 710,900 from 10 woreda. within the time period of 20/02/2016 – 5/03/2016the town is located 423 kmsouthwest of the capital Addis Ababa. This town has a longitude and latitude of 8°27′N 36°21′E and an elevation between 2,012–2,162 meters (6,601–7,093 ft) above sea level. Total population for Bedele were 19,517, of whom 9,837 were men and 9,680 were women Bedele prison has a total of five hundred prisoners and seven cells. The town has a characteristic of tropical highland climate condition, heavy rain fall, warm temperature, and long wet period. Federal Democratic Republic of Ethiopian Population Census Commission, Summary and Statistical Report of 2007 Population and Housing Census, UNFPA, Addis Ababa, Ethiopia, 2008. (33)

4.2. Study Design

A cross- sectional study design will be conducted on the PTB suspected patients visiting Bedele hospital laboratory during the study period.

4.3. Population

4.3.1. Source Population

The source of population for this study will be all individual who visit Bedele town hospital laboratory during the study period.

4.3.2. Study Population

The study population for this study will be all suspected patients who are requested for AFB examination at Bedele hospitallaboratory during the study period.

4.4. Sampling Technique

Convenient sampling technique will be used. All patients requested for AFB examination at Bedele hospital laboratory during the study period will be included.

4.5. Sample Size Determination

Sample size for these study is calculated by using the formula

$$n = \frac{(Z\infty/2)2\ p\ (1-p)}{d2}$$

Where n= The minimum sample size required

P(Prevalence)= an estimate of the prevalence rate for the population (%)

Z∞/2=95% confidence interval

d= degree of margin errors a retrospective study in Agaro Teaching Health Center from 2005/6 – 2009/10 shows that prevalence (p=10.9%)(22) and

$$n = \frac{(1.96)2\ 0.109(1-0.109)}{(0.05)^2} = 149.2 = 150$$

by adding 15% non respondent rate, n= 160

4.6. Study Variable

4.6.1. Dependent variable

Infection with TB (AFB)

4.6.2. Independent variable

- Family income
- Smoking cigarette
- Drinking alcohol
- Consumption of raw milk
- Hosing condition
- Age
- Sex contact history with TB patients
- Occupational status
- Marital status

4.7. Material and Reagent

- Material

  - Sputum cup
  - Glove
  - Gauze
  - Applicator stick
  - Pipette
  - Microscopic slide

Reagents

- 3% acid alcohol
- Methyl blue
- Carbolfuchsin
- oil immersion
- clean water

4.8. Data collection process Plan

Data from socio-demographic and associated risk factors were collected using predesigned questionnaire by trained medical laboratory technologists. A 1–2 ml of sputum(particularly that which contains any yellow caseous material) that were collected spot morning spot was transferred to a 15–20 ml capacity of test tube and an equal amount 5% sodium hypochlorite (bleach) solution was added and mixed well. Then it leaves at room temperature for 15 minutes,

shaking at intervals to break down the mucus in the sputum, 8ml of distilled water is added and centrifuge at 3000 RPM for 15 minutes. The supernatant fluid was discarded with pasture pipette and the sediment was mixed well, a drop of the mixed-well sediment was transferred to a clean scratch-free microscopic slide, spread the sediment to make a thin preparation and allow air drying, heat-fix the smear and stain it using Ziehl- Neelsen staining technique. Finally the stained slides were examined microscopically for Acid Fast Bacilli (AFB) as described by

4.9. Data processing And Analysis

The data will be processed manually and analyzed by using available computer soft ware program (SPSS). Cross tabulation and simple descriptive statics will be used to show the positive rate with independent variable. Based on the result appropriate interpretation and discussion will be made by comparing results with similar local and international studies. Finally conclusion will be drawn and possible recommendation will be forwarded.

4.10. Ethical consideration

A consent letter from Jimma University student research program will be sent to Bedele hospitaladministration.Before starting data collection permission will be obtained from health center administration. The purpose of the study will be explained to patients and positive patients will be treated in the clinic.

4.11. Quality Assurance

To ensure the reliability and validity of the study result, the following quality assurance will be followed.

Pre-analytical phase

- Well experienced laboratory personnel will be participated in this study after orientation about the activity to be done.
- Patients will be aware how to collect spot-morning –stop +sputum
- Reagents and equipmentswill be checked for reliability and repro reliability of the test.

Analytical

- Sop will be used throughout the study time.

Post –analytical

- The result of the test will be cheeked be for giving to patient.
- The laboratory result recording form will be kept properly for rechecking.
- Clear and neat result report will be send to physicial

CHAPTER –FIVE

RESULT

Table 1. Distribution of study subjects according to age and finding of sputum smear examination result at Bedele hospital from 20-02-2016 to 5-03-2016

Variable	**Sputum examination result**		
Age in years	**Positive NO (%)**	**Negative NO (%)**	**Total NO(%)**
0-4	0	0	0
5-9	0	0	0
10-14	0	13(8.12)	13(8.12)
15-19	1(0.65)	17(10.62)	18(11.5)
20-24	1(0.65)	12(7.5)	13(8.12)
25-29	1(0.65)	12(7.5)	13(8.12)
30-34	1(0.65)	18(11.5)	19(11.87)
35-39	3(1.8)	14(8.75)	17(10.62)
40-44		18(11.5)	18(11.5)
>45	3(1.8)	46(28.75)	49(30)
Total	**10**	**150**	**160**

X2=5.9

P=0.543

A total of 160 study subjects was included in the study, from these 73(48.66%) were males and 77(51.33%) were females. From table.1, the highest burden were seen in the age range between 15-29 which accounts 5(3.33%) of the total positive cases.

Table 2 Distribution of subjects checked for TB sputum smear examination according to marital status, at smear examination Bedele hospital from 20-02-2016 to 5-03-2016

Marital status	**Sputum examination**		**Total**	**X2 and P value**
	Positive	**Negative**	**NO (%)**	
	NO (%)	**NO (%)**		
Single	4(2.5)	51(31.8)	55(34)	**X2=0.150**
Married	6(3.7)	99(61.8)	105(65.6)	**P=0.928**
Total	10	150	160	

As the marital status of population studied 105 (65.63%) were married and 55 (34.38%) were single.of those 4 (2.5%) and married 6 (4%) were sputum smear positive cases out of the study population for single and married respectively. There was no statically significant association factor, p> 0.05

Table 3 Distribution of study subjects according to educational status, finding of sputum examination at Bedele hospital from 20-02-2016 to 5-03-2016

Educational status		**Sputum examination**		**Total**	**X2 and P value**
		Positive	Negative	NO(%)	
Illiterate		4(2.5)	50(31.25)	54(33.75)	**X2=0.186**
Literate	**Read & write**	3(1.8)	40(25)	43(26.8)	**P=0.666**
	1-8	2(1.25)	14(8.75)	16(10)	
	9-12/10+		42(26.2)	42(26,25)	
	Higher	1(0.65)	4(2.5)	5(3.1)	
	total	6 (3.75)	100 (62.5)	106 (66.25)	
Total		10	150	160	

With regard to the educational status of the study population from the above table the majority of smear positive cases are illiterate, read and write 4, 3 respectively; Which accounts 70% of positive rate. The result of Table 3 according to the educational status status there is no significance association.

Table 4 Distribution of study subjects according to, occupation status and finding of sputum examination at Bedele hospital from 20-02-2016 to 5-03-2016

Occupation	Sputum examination		Total	**X2 and P value**
	positive	Negative		
Farmer	2(1.25)	43(26.8)	45(28.125)	**X2=13.1**
Government employer	1(0.65)	5(3.1)	6(3.7)	**P=0.022**
Student	1(0.65)	40(25)	41(25.6)	
Merchant		17(10.625)	17(10.625)	
House wife	2(1.25)	33(20.62)	35(21.88)	
Other	4(2.5)	12(3.1)	15(9.37)	
Total	**10**	**150**	**160(100)**	

The total of 160 suspects of smear positive PTB are farmer and house wife 2(1.25%) each, government employ and students each are 1 (0.65%) and 4(2.5) are those with other occupation. With regard to occupational status The result of Table 4 is significance association. P<0.05

Table 5 Distribution of study subjects according to sex smear positive result Bedele hospital from 20-02-2016 to 5-03-2016

Sex	**Sputum examination**		**Total**	**X2 and P value**
	Positive	**Negative**		
	NO (%)	**NO (%)**	**NO (%)**	**X2=0.54**
Male	6	72	78	**P=0.46**
Female	4	78	82	
Total	10	150	160	

The total of 160 suspects of smear posiyive PTB, were include in this study out these 78(48.7%) males and 82(51.3%) females. From those 6(4%) males and 4(2.5) female are positive, the highest prevalence was seen from the total smear positive cases from the Table 4 the result of study population there shows was no significant association factor p>0.05.

Table 6 Distribution of study subject according to residence smear positive result Bedele hospitalfrom 20-02-2016 to 5-03-2016

	Sputum examination		**Total**	**X2=0.45**
	Positive	Negative		**P=0.519**
	NO(%)	NO(%)	NO(%)	
Rural	8 (5)	118(73.75)	124(77.5)	
Urban	2 (0.625)	32(20)	34(21.25)	
Total	**10 (6.25)**	**150(93.75)**	**160**	

Among 160 pulmonary TB suspected patients 28(17.5%) were form urban of whom 1(0.6%) were positives and 113(83.5%) were from rural of whom to able the prevalence of smear positive cases high in rural. In terms of the rural and urban the result of study shows no significance association. P>0.05

Table 7. Distribution of study subject according to family size smear positive result Bedele hospital from 20-02-2016 to 5-03-2016

Family size	**Sputum examination**		**Total**	**X2=0.76E-2**
	Positive	Negative		**P=0.96**
	NO(%)	NO(%)	NO(%)	
0-5	5	70	75(71.4).	
6-9	2	27	30(28.5%)	
Total	7	98	105	

Out of the study population 105(65.6%) were family size 6-9 are < 30(28.5%) and 0-5 are 75(71.4). Regarding to the family size the study population no significant association p>0.05

Table 8 distribution of study subject according to smoking cigarette smear positive result Bedele hospital from 20-02-2016 to 5-03-2016

	Sputum examination		Total	**X2=1.58 P=0.209**
	Positive	Negative		
Smoking	NO(%)	NO(%)	NO(%)	
Yes	0	22	22(13.75%)	
No	10	138	138	
Total	10	151	160	

With regarding from the above table the total of study population 160 suspected from those smoking cigarette 22(13.75%) and 138(77.25%) non smoking cigarette from positive cases. Non smoking cigarette had high prevalence of smear positive cases. Out of the smoking cigarette and non smoking cigarette there was no association factors $p>0.05$

Table 9 distribution of study subject according to drinking alchohool smear positive result Bedele hospital from 20-02-2016 to 5-03-2016

	Sputum examination		Total	P=0.67 X2= 0.1801 Df= 1
	Positive	Negative		
Drinking alcohol	NO(%)	NO(%)	NO(%)	
no	3	55	58	
Yes	7	95	102	
Total	10	160	160	

With regarding from the above table the total of study population 160 suspected from those drinking alcohool 58(36.25%) and 102(63.75%) non drinking. from positive cases non drinkers had high prevalence of smear positive cases. Out of the drinking alchohool and non drinking alchohool there was no association factors $p>0.05$

Table 10:- Distribution of smear positive PTB by contact history No of rooms, No of windows among suspected patients visiting, Bedele hospital from 20-02-2016 to 5-03-2016

Contact history	**AFB examination**				**Total**		**Association**
	Positive		**Negative**				
	No	%	No	%	No	%	
Yes	0		2		2		x2=0.133
No	10		148		158		p=0.715
Total	10		150		160		
No of window							P=0.08 X2= 11.9
1	3		11		14		Df= 3
2	4		37		41		
3	2		99		101		
4	1		3		4		
Total	10		150		160		
No of room							P=0.041
1	2		13		15		X2=8.27
2	2		39		41		
3	5		97		102		
4	1		1		2		
Total	10		150		160		

Based on the study previous contact history with TB patients, statically associated with occurrence of smear positive PTB. contact history and No of windows had no statically associated with the prevalence of smear positive PTB. number of room is associated with Prevalence of smear positive PTB ($p<0.05$).

CHAPTER SIX

DISCUSION

Over all prevalence of this study was (6.25%). Male was comparatively more exposed for risk factors to PTB such as family income. The result of this study shows there was statistically significant association between the prevalence obtained in this study was 10(6.25%) which is grater when compared to study done in Thailand, 22132(30.9%) were identified as TB suspects, and 254(1.2%) were confirmed by sputum smear for TB.Thai prison in 2007. The finding of this study also shows there was statistically significant association between the prevalence obtained in this study was 10(6.25%) which is grater when compared to study done in Central India, 2341 individual eligible for screening 297(7.9%) were positive for PTB.Jobalpur in 2007. This study reveals that the prevalence of PTB was higher among male and rural area (17). The finding obtained in this study 10(6.25%) which is lower than the study done in Agaro teaching health center (10.9%) from 2005/6-2009/10 for five years. In terms of educational status the prevalence rate of smear positive was increase illiterate 4(2.5)/54(33.75) than literate 6 (3.75)/106(66.6). because of lack of awareness and way of transmission of mycobacterium TB have In the study of above result there was no statistically significant association between smear positive cases and literacy status, ($p>0.05$) in the case of occupational status such, farmer government employer, merchant, student and other. The rate of smear positive prevalence was high in occupational, categorized as other, (daily worker, prisoner, carpenter and driver). Which accounted 4(2.5)/15 two of them are prisoner which is higher percentage with comparing to others(farmer, government employ, student, merchant & house wife).with comparisons with A cross-sectional

survey conducted in 2009 in 18 prisons in Malawi, this study is greater than urban prison(1.1%) and district prison (0.3%). in farmer and house wife 2(1.25%) each, government employ and students each are 1 (0.65%) and 4(2.5) occupation the rest is student 2(1.33%). This might be due to economic status and life style. The result of this study also shows there was statistically significant association between occupational status, **P=0.022.**However, the result of study measured in terms of smoking cigarette and non smoking cigarette totally there is no association with smoking cigarette, all are non smoker prevalence of smear positive is high in non smoking cigarette 10(6.25). no of window and contact history has no siginificant association. No of room has siginificant association, $p<0.05$. the rate of smear positive pulmonary tuberculosis also high in those who had large family size and in the farmers.

Conclusion and Recommendation

7.1 Conclusion

In general, the magnitude of PTB in this study population was 10(6.25%) further more the result of present study revealed same of the associated risk factors, such as residence, family size, educational status and sex are the same which no have associated risk factors. There was also significant association between no of room and occupational statuses are had smeared positive PTB cases.

7.2 **Recommendation**

The concerned body shall interfere to reduce the prevalence of TB.

-Health education on the mode of TB transmission and prevention method shall be given to the community.

REFERENCE

1. World Health Organization, 2015 global Tuberculosis report. 20 AvemueAppia, 1211 Genrva 27, Switherlan
2. World Health Organization, 2014 global Tuberculosis report. 19 AvemueAppia, 1211 Genrva 27, Switherlan
3. *www.afro.who.inv*
4. Kenneth Toda, Mycobacterium Tuberculosis, *text book of bacteriology.net/tubercul...*
5. December '2008'. Feasibility ' study and orientation>DrKushionozaki WHO. The free encyclopedia of tuberculosis Wikipedia the free encyclopedia of Tuberculosis. http://en.wikipedia.ovg/wik/tuberculosis,2012 Unaids.org.
6. Global TB control 2014,WHO. http://www.afro.Who.inv
7. The free encyclopedia of tuberculosis http://www.who.int/tb Publications/global report on 2001.
8. Guidline for prevention of transmission of TB in health care facilities,
9. WHO, an expanded DOTS fram work for effective tuberculosis control,2002, p-3
10. Patrick R.murray kens Rosenthal and Michael A. Ptave, Medicalmicro biology 11A. 5th ed 2005-297-305
11. http://www.who.int/+b/publication/global report on 12No:2008
12. The free encyclopedia tuberculosis http://www.who.int/tb publications/ global report on 2007
13. MOH, Tuberculosis, leprosy and TB/HIV prevention and control program, 3rd edi 2005,P 10-congregate and community setting in Ethiopia federal**. MOH**, April; 2009
14. WHO, sixteen global reports on tuberculosis, 2011, www, slide shair,net/willacumu/global-tuberculosis control, assessed date 24/11/2011
15. World Health Organization, global tuberculosis control2009, 20 Avenue Appia,1211 Geneva 2007, available from The free encyclopedia of tuberculosis http://www.who.int/tb/publications/global report on 2009
16. JittimaneeSx,Ngamtrairai N, White MC, Jittimanee S, Prevalence survey for smear positive TB in Thai prison, int J Tuberc lung Dis,2007 May; 11(5):556-61
17. JyothiBhat, VikasGrao, PunnathathwGopalanciopi, ----prevalence of PTB amongest the tribal population of Madhya Pradesh central India, Indian Medical association May, 5-2009.
18. Rao VG., Bhat J., Yadau R., Gopalan GP., Nagamiah S., et.al, Prevalence of PTB baseline survey in Central India; PLoS ONE, 2012,7(8): e43225 doi:10, 1371
19. Sanchez A,Gerhardt G, Natal S,..*et al Prevalence of PTB and comparative evaluation of screening strategies in Brazilian prison, Int J Tuberc lung Dis, 2005 Jun; 9(6):589*

20. *Lagrage-Xelot M, Porcher R, Gallien S., Wargnir A., Pavie J., deCastro N., Molina JM, prevalence and clinical predictor of PTB among isolated patients in Paris, Clin.Micribial infect, 2011, Apr; 17(4): 610-14*
21. Esther N., Godfey M., Eluid W., and Odd. MO; Pulmonary Tuberculosis among women with cough attending clinics for family planning and maternal and child health in DarEs Salam, Tanzania; BMC public health 2009, 3; 9(1): 273.19646288.
22. .SC verma, GP Dhungana, Hs Joshi, HB.Kunwar, RkJha, Akpokhrel, prevalence of PTB among HIV infected drug user in Pokhara; Kaski, Nepal, Tuberculosis, lung disease and HIV/AIDS 2010, v-7, N(2) Imam,T.S, and Oyeyi. T.I., A retrospective study of PTB prevalence amongest patients attending infectious diseases hospital (IDH) INKANO, Nigeria; Bayero journal of Pure and Applied science,2008, v-1: p,10-15 S.S.K. Acquah, L, Quaye, J.B. Ziem, E.D. Kuugbee,
23. A.Y.Iddrisu,Sagoe prevalence of smear positive Pulmonary Tuberculosis among outpatients after decs, the case of Tamale Teaching Hospital; journal of Medical and Biological Science, 2012; 1(4): 34-41
24. Sobaniponi FM, Horries AD, Gausif F, Banda HT: Prevalence of smear positive PTB among prisoners in Malawi; PMID: 1991 -1976 National survey; 2009, V-13(12). P: 1557-1559.
25. MOH, Tuberculosis and Leprosy Prevention and Control Program (TLCP) manual, Ethiopia; MOH 2nd edi,2002
26. Shargie E.B, Yasin . M.A, Lindtjorn, B; Prevalence of smear positive PTB in rural district of Ethiopia; Jan -2006, 1-10, N(1), p:87-92
27. Hussin A;, Ahmed Z., Abiyu M., Solomon Al., Solomon A., Prevalence of smear positive PTB among patients at Agaro teaching health center; Ethiopia J health sci, March 2012, 22(1): 71-76.
28. Yitayih W., Dagnachew ,. Yeshambel B.; Prevalence of PTB and Immunological profile of HIV co-infection patients in North west Ethiopian; Ethiopia J health sci; 2012, 5:331 doi 10.1186/1756-0500- 5-331
29. Abebe D.S, Djune G., Ameni. G., Bitta. D., Abebe F.; Prevalence of PTB and associated risk factor in eastern Ethiopia prisons; international journal of TB and lung disease. May -2011, v-15 No – 5,p-668-673.
30. Beyene M., Fanaye A., Moges T. --- Prevalence of smear positive PTB among prisoners in North Gondar zone prison. North west Ethiopia; BMC infectious disease 2012: v-12, p-352.
31. Gebre D. Mimano LN.; prevalence of smear positive pulmonary Tuberculosis among patients attending Seka health center, JIMMA, Oromia region, Ethiopia; East Afri J public health, 2010 Sep; 7(3): 263-
32. BulaBoruWinsa and AbdurehmanEshete Mohammed: Investigation on Pulmonary Tuberculosis AmongBedeleWoreda Prisoners, Southwest Ethiopia. International journal of biomedical science and engineering, 2015, 3(6); 69-73. Available from http://www.Sciencepublishinggroup.com/j/ijbse

33. Bedele-Wikipedia,thefree encyclopedia; https://en.m.wikiepedia,org>wiki>BedelFederal Democratic Republic of Ethiopian Population Census Commission, Summary and Statistical Report of 2007 Population and Housing Census, UNFPA, Addis Ababa, Ethiopia, 2008.
34. . Cheesbrough M (2006). District Laboratory Practice in Tropical Countries Part 2.Second Edition. Cambridge University Press

ANNEX – TWO

LABORATORY PROCEDURE

1. Smear the appropriate sputum on microscopic slide
2. Allow the smear to air dry
3. Cover the smear with carbolfuchsin (primary stain) and heat the stain until vapor come out and wait for 5', do not over heat.
4. Wash off the stain with clean water.
5. Cover the smear with 3% acid alcohol (decolorize) until the smear the is sufficiently decolorized for 1 minute
6. Wash off the smear with clean water again.
7. Cover the smear with ethyl blue (counter stain) for 2'
8. Wash of the stain with clean water.
9. Wipe off the back of the slide with tissue paper and allow air dry.
10. Use a drop of oil immersion and examine