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COLLEGE OF HEALTH SCIENCES

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PREVALENCE OF MDR-TB AND TREATMENT OUTCOME AMONG TUBERCULOSIS PATIENTS ATTENDING AT ST. PETER TB SPECIALIZED HOSPITAL ADDIS ABABA, ETHIOPIA

BY:

Gashaw Mequanint (BSC, MSC candidate)

A THESIS SUBMITTED TO SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA UNIVERSITY FOR THE PARTIAL FULFILLMENT OF REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN MATERNITY AND REPRODUCTIVE HEALTH NURSING

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BY: GASHAW MEQUANINT (BSC)

ADVISOR: ZURIYASH MENGISTU (MSC,)

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APPROVED BY THE BOARD OF EXAMINERS

This thesis by Gashaw Mequanint is accepted in its present form by the boards' examiners as satisfying thesis requirement for the degree master in maternity and reproductive health nursing.

Internal Examiner:

_____ _____ _____ _____/__/_____

Full name **Rank** **signature** **Date**

RESEARCH ADVISOR:

_____ _____ _____ ____/__/____

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Acronym

AM: Amikacin

CDC: centre for disease control

CI: confidential interval

CM: capreomycin

CS: cycloserine

DOTS: direct observing treatment strategy

DST: drug susceptibility test

ETH: Ethambutol

ETO: Ethionamide

FMOH: Federal Minister of health

FQ: Fluoquinolone

FLD: First line drug

GLC: Green light committee

HIV: Human immune virus

INH: Isoniazid

IUATB: International union Against Tuberculosis

KM: Kanamycin

MDR-TB: Multidrug resistance tuberculosis

MMWR: Morbidity and Mortality weekly report

NTP: National TB Program

PAS: Para-aminosalictlic acid

PZA: Pyrazinamide

RIF: Rifampicin

SLD:- Second line drug

TB:- Tuberculosis

WHO:- World Health organization

(X)DR-TB:- Extensively drug resistance tuberculosis

Abstract

Background-The emergence of drug resistance tuberculosis, particularly MDR-TB has become a major public health problem in a number of countries and an obstacle to the global TB control efforts. Information on treatment outcomes among hospital patients with multi drug resistant tuberculosis (MDR-TB) and tuberculosis were scare in Ethiopia.

Objective:- The study was carried out the prevalence of MDR-TB an Treatment outcome among tuberculosis patients attending at St. Peter TB specialized Referral Hospital from January 1, 2011to end of December 2013.

Method:- The study design was descriptive retrospective cross-sectional study using data collected from medical records, radiological reports, bacteriological reports and consultant reports of MDR TB on 680MDR tuberculosis patients. Data has taken from January 2011 to end of December 2013 .Frequency, median and range were computed for descriptive analysis. Binary and multiple variety analysis were computed for inferential analyze. The ethical approval was obtained from AAU Institutional Review Board (IRB).Patient care records were kept confidential.

Result: The median age was 29 years (inter-quartile range 24– 37), with similar sex proportions (53.5% female).The number of MDR TB patient vary with their residence .Most of the patients were from Addis Ababa, the capital city of Ethiopia 385 (56;4%) followed by Oromo region 144(21%).. MDR TB prevalence increase from time to time as the study showed that 22.9% in 2011 to 48$ in 1013, There were strong association between the contracting co infection and MDRTB unsuccessful outcome.

Conclusion and recommendation: MDR TB prevalence increase from time to time. There were strong association between the contracting co infection and MDRTB unsuccessful treatment

outcome. Therefore; use of rapid, sensitive and specific methods for detecting MDR-TB must be recommended to combat the problem of MDR-TB.

Keyword- MDR-TB, Resistance TB, Anti- TB Regimen

I. INTRODUCTION

1.1 Background of the study

MDR-TB is defined as tuberculosis caused by mycobacterium tuberculosis resistant in vitro to the effects of Isoniazid and Refampicin with or without resistance to any other drugs. Drug resistant TB is confirmed through laboratory tests that show that infecting isolates of M. tuberculosis grow in vitro in the presence of one or more anti-TB drugs.

The emergence of drug resistance tuberculosis, particularly MDR-TB has become a major public health problem in a number of countries and an obstacle to the global TB control efforts. Nearly half a million cases of MDR-TB emerge every year but only 3% of them get treatment globally and 100,000 die annually(1).Ethiopia is one of the 27 high burden M(X)DR-TB countries ranking 15th with more 5000 estimated MDR-TB patients annually. The estimated Multidrug resistance cases are1.6% and 12% among all new and previously treated TB cases respectively (2).MDR-TB is essentially man made that emergence as result of poor TB control including poor supply management and quality of anti TB drugs, improper/inadequate treatment which is further fuelled by high prevalence of human immunodeficiency virus in the counties(3)

In consequence to the success of anti-TB treatment, both TB morbidity and mortality rates decreased during the 60‟s and 70‟s of the twentieth century. In a TB endemic country, the disease may be the first one to be associated with HIV-positive patients. The condition has become further alarming as HIV- positive patients have been found to acquire Multi- Drug resistant Tuberculosis (MDR-TB), which are more toxic, less effective and very expensive. Thus the epidemic of TB entrenched in the epidemic of the HIV infection represents the greatest hazard to

the general public and health-care providers (4).HIV –positive individuals are at a high risk of getting re-infection with TB due to impaired innate immune responses (non-specific defense mechanism) HIV-positive individuals co-infected with TB are a potential source of transmission of the infection in a community, thereby leading to an increase in incidence of TB(5).

In the case of TB disease, challenges include fear of stigmatization, which can discourage patients from presenting for treatment and follow-up care and taking medication in front of others .certain characteristics of TB treatment make adherence difficult, including regimens of multiple medications, medication, medication-associated side effects, and the need to take medication beyond the symptomatic phase of the disease. Several factors contribute to high profile of adherence to treatment for TB disease (5).

1) TB is a contagious disease with risk of transmission to others
2) Non adherence is also associated with risk of developing drug-resistant organisms that may be spread throughout the community (6).

1.2 Statement of the problem

MDR-TB is manmade problem causes of in adequate anti-TB treatment and the emergence of extremely drug resistant TB further complicates the efforts to tackle the problem especially in developing countries including Ethiopia. The MDR-TB diagnosis and appropriate treatment the major challenges in Ethiopia.

Globally in 1994 to 2010 multidrug resistance was observed in 3.4% and 19.8% of all new TB cases and previously treated TB cases respectively. Based on the prevalence rate from the survey and TB case notification in 2000/8 the magnitude of MDR-TB in Ethiopia was estimated to be 997 cases which includes 651 and 346 MDR-TB cases among newly diagnosis and retreatment cases respectively (9).

MDR-TB which is mostly affected the poor, illiterate, reproductive age group, immune-compromised individuals, low economic status and associated with the social structure of the society.

MDR-TB is largely being sequence of human error as a results of individual or combination of factors related to management of drug supply, inappropriate guide line, poor adherence, poor infection control practice, poor storage conditions, wrong dose or combination, poor organized, lack of information, no monitoring of treatment, inadequate implementation of DOTS strategy were major gap contributing for spread of MDR-TB. The management of MDR-TB will be an integrate component of the NTP, aware of the community the transmission of MDR-TB, organized all health professional and will be implemented through the existing health care delivering system (13).

1.3 Significance of the study

MDR-TB is mainly occurred as results of poor treatment outcomes, poor treatment adherence, poor quality of drugs and poor infection control practices. Ethiopia is one of the high burden countries for MDR-TB. However, the extent and the magnitude of the problem is not well studied.

So it is important to study the assessment of MDR-TB and its treatment outcomes among tuberculosis patients to manage patients not to be transmitting the disease to others, in addition the studied would also assessed the situation in the studied area. Such studied was conducted at minimum before study area. Thus, it would give new in sighted for the Hospital and organizations are working on TB. Policy maker, programmer, manager and the public in general in ordered to improve the treatment outcome of MDR-TB in the hospital and community.

Moreover, the study will be initiated further research to control MDR-TB.

2 Literature Review

In 1994, along with the international union against TB (IUATB), the world healthcare organization started the "global project on anti-tuberculosis drug resistance surveillance" just at the time during the first half of the 90"s. When the first multi-Resistance TB outbreaks were taking place in Europe and U.S mostly affected patients were infected patients with HIV. These patients displayed "explosive" transmission patterns along with high attack rates and short incubation periods caused by their immunodeficiency status and lack of correct means to avoid TB airborne transmission in hospital units, accommodation and penal institutions affected by TB outbreaks (7).

In spin, a mycobacterium bov is strain to all first line drugs, quinolones, injected agents and to almost all available second line drugs caused a major epidemic outbreak affecting 49 patients in a hospital,,s HIV units in Madrid, from 1991 to 1958.9. The outbreak spread. Finally affecting at least114 patients from 22 Spanish hospitals and two further contacts who later developed the disease in Netherlands and Canada (8).

The first global data concerning resistance to anti TB drugs, obtained by the WHO and IUATB, were published in their 1997 report, and matched the results of the resistance surveillance carried out in monitoring labs from 35 different countries around the globe since 1994 till 1997. Evidence of primary multi-resistance was found in all 35 countries subject to study. The primary resistance rate median was 1.4% although it reached up to 14.4% In Latvia and rose over 2% in one out of three countries. It did not come as a surprise that those countries with insufficient anti-TB programs were the most affected by multi-resistance .Global resistance figures provided by the report clearly depicted the full extent of this healthcare issue in some areas. In Latvia, 30% of

patients under anti-TB treatment were infected by multi-resistance strains, In Russia this figure reached 5%, 10% in Dominican republic 13% in Delhi (India)(9).

Subsequent surveillance reports dating from 2000, 2004, 2005 and 2010 increased the number of countries subject to study to 109, finding evidence that whereas in countries with low TB incidence resistance rates remained stable, they dramatically high in some regions, such as the Baltic republics, Russians some of the former soviet union republics (Moldavia, Azerbaijan, Kazakhstan, Uzbekistan), South Korea, Peru and some Chinese and India provinces (10).

IN the 36th Edition of the "World conference on lung health" from October 2005, data regarding a world surveillance program on second line drug resistance, carried out by the World‟s reference laboratories together with U.S centre for disease control and prevention (CDC), was presented. This was the first time the term "extensively drug resistance tuberculosis" (XDR-TB) was used (11).IN the conference on retroviruses and opportunistic infection (CROI) from February 2006 an outbreak of XDR-TB in the region of Kwa-zulu natal in South Africa was reported .Epidemiologic concern on the emergency of MDR-TB and the definition of XDR-TB was jointly published by the CDC in the journal morbidity and mortality weekly report (MMWR), as well as by the WHO in the weekly Epidemiologic record from march 2006 (12, 13).

The original definition included those TB cases with a strain resistance to isoniazed and Rifampicin, as to at least three of the six second line agents:- amino glycoside, polypeptides, (capreomycin), fluoquinolones, thionamides, cycloserine and PAS (13).

A study conducted in South Korea, 690 isolated dating from 2000 to 2004 were studied among which 11939 came from South Korea (11% of which were MDR-TB),5551 isolates came from (10%) were XDR(15% of the Korea MDR-TB)strains and 7% of the MDR-TB strains of the

other countries). XDR strains were more frequently found in South Korea and in other countries from Easter Europe and Western Asia. Excluding Korea strains, the total number and the proportion of XDR strains had suffered a significant increase during the study period (14 strains-5% in 2000: 34 strains-70% in 2004).The report included information on the evolution and therapy response of 490 MDR-TB cases and 115 XDR-TB cases treated in Latvia from 2000 to 2003(13).

In October 2006, the first meeting of the" Global XDR task force" was held in Geneva, under the management of WHO.The definition of XDR-TB was then reviewed and it was suggested that it included those strains resistance to Rifampicin, Isoniazide and fluoroquinolones and to at least one of the three injected second line agents (Amikacin, Kanamicin or capreomycin). There were two reasons for changing the definition .In the first place, technical and reproducibility difficulties related to susceptibility studies regarding some second line agents caused the first definition to become inaccurate. Secondly, the determining factors for therapy failure were proven to be both resistances to quinolones and injected agents as well as the institution of regimens without these drugs for treatment of MDR-TB (14).

The latest official data regarding MDR-resistance correspond to the 4th reports of the WHO. It estimated between390,000 and 510,000 new cases of MDR-TB worldwide for 2008.This figure corresponds to3.6 % of all the case (c.i 95 %,3.0-4.4) 50 % of the patients were diagnosed in China and India in 2008.around 150,000 people passed away due to MDR-TB .The report includes representative data on second line resistance from 46 countries . In those countries, 5.4 % of MDR-TB cases were XDR (15).

When the report was drafted 58 countries has reported XDR-TB cases 11-12. Data regarding MDR-TB surveillance during 2008.In all 25 countries of the European Union and the European Economic .Areal 5 were recently published with 28.295 isolates given account of which represent only 34.4 % of the 82,611TB cases reported in that year. MDR-TB strains represented 6 % of isolates,7.3 % of MDR-TB cases were XDR-TB and 123 out of 25 countries reported some XDR-TB case. Estonia, Latvian, Lithuania and Romania presented the high MDR and XDR strains rates. Spain reported 8214 TB cases in 2008,4,493 with positive culture ,1628 of under were sensitivity testing 76 MDR-TB case of (4.7 % of all strains subject to study) ,3 being XDR. 31 isolates came from 1080 patients without any previous European countries is alarming with primary multidrug-resistance rates reaching 4.3 % in Romania, 9 % in Lithuania , 12.1 % in Latvia and 15.4 % in Estonia (16).

The Literature identifies specific groups as likely treatment defaulters. A study in Ethiopia concluded that men have twice the risk of treatment default than females .Also the most excluded sectors of society were more likely to interrupt treatment such as migrants, un documented workers, the unemployed the homeless, the mentally ill and drug addicts in united states and western Europe. In developing countries, rural, older less educated people are more likely to default (17).

A 2005 study in the Southern region of Ethiopia, indicated, that the introduction of DOTS in 1996 and its subsequent expansion to reach a population coverage rate of 75 % in 2001 led to an increase in treatment success and decrease in default and failure rates for smear positive patients rose from 38 % in 1994 to 78 % in 2000, the default rate declined from 38 % to 18 % and treatment failure declined from 5 % to 1 %(18).

A study showed that MDR TB patients samples were subjected to the culture and Drug Susceptibility Test with the prevalence of MDR-TB seemed to be 38.8%

.Similarly, the study reported that high rates of TB-HIV co-infection 22.5% in MDR-patient. Continuous increasing trend of MDR-TB was observed , 36.4%, 36.7%, 39.1% and 40.8% in 2007, 2008, 2009 and 2010, respectively(19).

tuberculosis at referral centre in Northern India: A 4-year experience. 2013; 31 (1): 40-46.

The study showed that the median age of MDR TB patient was 31years (inter-quartile24.5 - 40). That report experience higher results with standardized regimens than those reported in the meta-analysis (74.2% vs. 54%), while patients in the study who received individualized treatment achieved similar outcomes (66% vs. 64%)(20).

Pulmonary disease was most common (70.1%,) with sputum smear positive. Only 30.4% (56/184) of patients had a previous history of TB diagnosis.

Univariate analysis of drug resistance pattern, treatment regimen and treatment management associated with successful treatment outcome in patients diagnosed with multidrug-resistant tuberculosis. The proportion of MDR-TB cases notified between 2004 and 2007 completing treatment in the United Kingdom was 70.6 %.(21).

Successful TB treatment outcomes were below the 85%b threshold suggested by the WHO. The estimate of 74.4% found is coherent with those from WHO surveillance. .Unsuccessful outcomes, defined as failure and treatment interruption, are strong predictors of MDR but other outcomes, such as death, loss to follow-up, transfer-out, or those for whom the outcome is unknown, contribute to the low threshold level of success. A valid estimate of these outcomes is essential in evaluating TB control programmed as well as in suggesting adequate corrections (22).

3 OBJECTIVE

3.1 GENERAL OBJECTIVE

To assess MDR-TB and its Treatment outcome among tuberculosis patients attending in St. peter TB Specialized Hospital from January 2011 to end of December 2013.

3.2 Specific Objectives

3.2.1To assesses the magnitude of MDR- TB among tuberculosis patients.

3.2.2 To identify the determinants of MDR- TB among tuberculosis patients.

3.2.3 TO determine the association between MDR-TB and its contributing factor.

4. Methods and Materials

4.1 Study Area

The study conducted in Addis Ababa City at St. Peter TB Specialized Hospital which is established 40 years ago. St. Peter TB Specialized Hospital is currently located in Gulele Sub city, woreda 02. St. Peter hospital is one of the tuberculosis hospitals in patients and out patients do to their large experience in the management of TB, this center has been chosen as the facility that will be response of providing treatment and follow up of the first cohort of 45 patients with MDR-TB in the country under supervision of national TB control program.. There are a total of 165 technical and 228 administrative staffs that includes internist, Microbiologist, public health specialist, radiologist, physicians, health officers, nurses, pharmacists, laboratory technologist, etc.

4.2 Study Design.

Descriptive retrospective cross-sectional study design was used to assessment the magnitude of MDR-TB patients and its treatment outcome among tuberculosis patients in St. Peter TB specialized referral hospital during January 1, 2011 to end of December 2013.

Socio-demographic and clinical data were retrieved from medical records, treatment charts, bacteriological laboratory reports, radiological reports, expert consultation reports and side effect reports from the hospital MDR-TB database during January 1, 2011 to end of December 2013 period. The risk factor information including HIV status of the patients, the previous treatment for tuberculosis, MDR-TB contacts history with an infected patient and substance abused history.

4.3 Study period:-

The study was conducted from March to April to review retrospective data during January 1, 2011 to end of December, 2013).

4.4 Source of population and study population

4.4.1 Source of population

All patients who were attended in St. Peter TB specialized Referral hospital Addis Ababa for medical purpose in the last three year (from January 1, 2011 to end of December 2013) with receded data.

4.4.2 Study of population:-

Each individual MDR-TB laboratory confirmed patient who started treatment in St. peter TB specialized referral hospital during January 1, 2011 to end of December 2013 period.

Drug susceptibility Test (DST) and medical records of all tuberculosis patients receiving inpatients and outpatients treated in St. Peter TB specialized referral hospital during January 1, 2011 to end of December 2013 were retrospectively reviewed.

4.4.3 Inclusion criteria:-

All Tuberculosis patients who developed MDR-TB (MDR-TB patients with record tuberculosis Patients who knows their MDR-TB sputum culture positive).

4.4.4 Exclusion criteria:-

All TB smear negative patients who developed MDR-TB.

4.5 Sampling techniques and Sample size

All individual MDR-TB record consisting of laboratory confirmed who started treatment in St. Peter TB specialized referral hospital to complete MDR-TB treatment from MDR-TB registered format, laboratory MDR-TB registered format and patient care card during January 1, 2011 to end of December 2013.All MDR-TB patients who were treated in St. Peter TB specialized referral hospital during January 1, 2011 to end of December 2013 are sampling size.

4.5.1 Sampling technique

The sampling technique I used for selection to my study subject took orderly all started during January 1, 2011- December 2013 from Medical records, MDR-TB treatment record, radiological report, bacteriological reports and expert consultant report.

Each individual MDR-TB patients record was selected from all tuberculosis patients record in St. peter TB specialized referral hospital using MDR-TB treatment card, MDR-TB register form, laboratory register for culture and DST, Quarterly report on MDR-TB case finding format, Quarterly report on MDR-TB case enrolment form, six month interim outcome assessment of confirmed MRD-TB cases form and treatment support card that were documented during January 1, 2011 to end of December 2013 will be review.

4.5.2 Sample size

All MDR-TB patients confirmed and started MDR-TB treatment from January 1, 2011 up to December 2013 had taken sampling size so I didn‟t need calculated.

I determined the sample size all MDR-TB confirmed and started treatment.

4.6 Data collection procedure

Started from January 2011 to end of December 2013 orderly were reviewed all the necessarily registration formats

I extracted data from medical records, treatment charts, bacteriological laboratory reports, and radiological reports in St. Peter TB specialized referral hospital MDR-TB results during January 2011 to end of December 2013.

4.7 Study variables:-

4.7.1 Dependent variables

- Treatment outcome

4.7.2 Independent variables

- Socio-demographic data
- Drug poor storage
- Social barrier
- Lack of information
- Poor adherence
- Substance dependency

4.8 Data Quality Assurance and management

The check list was adapted from the medical registration book of MDR-TB to specific settings. The check list was modified according to the study variable included and specific context.

Pre test had done on 6 months of the total sample of three year before data collected took place in non- included years of registration in the same study area and necessary corrections on the check list was made before applying to the main study subjects to check the list quality. During the data collection procedure double cleaning method was conducted by principal investigator. The check list was arranged using sample starting number by showing the year. The data collectors and supervisor were trained before data collection.

4.9 Data processing and Analysis

Before the data analysis started, the data coded, edited, organized, cleaned, and stored using SPSS soft ware.

The descriptive statistics including frequency, median and range was employed.

For inferential statistics logistic regression was used to see the association between MDR-TB and its contributing factor.

4.10 Operation Definition

First line Drugs:- The drugs isoniazid (INH), Rifampicin (RIF), Pyrazinamide (PZA) and Ethambutol (ETH) are collectively called the first line drugs (FLD)

MDR-TB:- TB caused by drug resistance of at least INH and RIF or mostly RIF resistance considered as MDR-TB.

Failure: -Treatment was considered to be having failed if two or more of five cultures in the final 12 months of therapy are positive or if any one of the final three cultures is positive.

Default red:- MDR-TB patient whose treatment was interrupted for two or more consecutive months for any reason without medical approval.

Relapse (R) a patient declared cured or treatment completed of any form TB in the past, but who reports backs to the health service and is now found to be AFB smear positive or culture positive

Sputum conversion:-defined as two sets of consecutive negative smears and cultures taken 30 days apart.

Reversion(to positive):-culture is considered to have reverted to positive when, after an initial conversion, two consecutive cultures, takes at least 30 days apart, are found to be positive. For the purpose of defining treatment failure, reversion is considered only it occurs in the continuation phase.

Interim result:-is the status of culture result during the six month of treatment.

Cured:- MDR-TB patient who has completed treatment according to programmed protocol and has at least five consecutive negative cultures from samples collected at least 30 days apart in the final 12 months of treatments. If only one positive culture is reported during the time and there is no concomitant clinical evidence of deterioration, a patient may still be considered cured

Treatment completed:- MDR-TB patients who has completed treatment according to programmed protocol but does not meet the definition cured because of lack of bacteriological results (i.e fewer they were performed is the final 12 months of treatment).

Mono-resistance:-Resistance to one anti-tuberculosis drug

Poly-resistance:-Resistance to more than one anti-tuberculosis drug. Other than both isoniazid and Rifampicin

Extensive Drug-resistance (XDR) :Resistance to any Fluoroquinolone and at least one of the three inject able second line drugs (CM,KM,AM).

Transferred out : MDR-TB patient who has been transferred to another reporting or recording unit and for whom the treatment outcome is unknown.

Primary resistance- is resistance in cultures from patients with no history of previous TB treatment or patients who had received for less than one month.

Acquired/secondary resistance-refers resistance in cultures from patients with one or more previous TB treatments episodes, of more than one month each resistance levels in retreatment are always higher than in new patients and provide an indication of the extent to which patients were appropriately treated i.e the quality of TB control.

N.B The term primary and acquired have been discontinued as epidemiological terminology as exact causative nature of drug resistance in a patient is not always possible to assess.

4.11 Dissemination of the result

The result obtained from this thesis was disseminated to Addis Ababa University, all Addis Ababa Hospitals, all Addis Ababa health centers and St. Peter TB specialized referral Hospital

4.12 Reliability and Validity of the data collecting instruments

To ensure the reliability and validity of the instruments pretest was carries out of MDR-TB and some modifications were made on the questionnaires and in deep questions.

4.13 Ethical Clearance

Ethical clearance was obtained from Department of Nursing and Midwifery Institutional review Board. At the locality necessary arrangements were made concerning this issue. Letters have written first from Department of Nursing and Midwifery Institutional Review Board to St. Peter Hospital.

Confidentiality of patient record chart and registration was keep.

The permission for using the information in the medical records of the patients for research purposes was obtained from St. Peter TB Specialized hospital.

5. Results

From January 2011 to December 2013, a total of 2149 TB patients were received for in-patient treatment at St. Peter TB specialized referral hospital. of which 780 (38 %) patients were MDR-TB (culture positive).Among MDR TB patients who were subjected to DST.(Drug Susceptibility Test) 100(14.7 %) were not included in this study while 680(32%) MDR-TB patients ,record were reviewed.During the past three years, in 2011, 2012 and 2013 there were 156 (22.9%) , 296(43.5% and 328(48*) MDR-TB respectively . Among 328(48% MDR TB patients) the stream MDR-TB registered patients 100 (14.7%), Were not included in this study because of 100 patients were under stream researched. Stream research means decreased the treatment period with in nine (9) months and also started successful in the past eight months (Table 1).

5.1 Socio-demographic character

The median age was 29 years (inter-quartile range 24– 37), relatively with similar sex proportions (53.5% female). The number of MDR TB patient vary with their residence more than half of the patients were from Addis Ababa, the capital city of Ethiopia 385 (56;4%) followed by Oromo region 144(21%). The age classification was depending on the past researched and also suitable for this thesis. (Table 1).

Table 1. Socio-demographic characteristics of the patients at St. peter TB Specialized during January 2011 to December 2013.

Variables	Frequency	Percent
Age of Patient;		
<20	51	7.9
20 to 39	479	70.1
>40	150	22..0
Sex : Male	316	46.3
Female	364	53.5
Residence		
Addis Ababa	385	56.4
Oromo	144	21.1
Amhara	40	5.9
Tigre	32	4.7

5.2 Clinical and treatment characteristics

Out of 680 MDR- TB patients 628(91.9%) respondents were receive second line drugs in the past. There were 467(73.2) MDR- TB patient who did have history of MDR TB contact; the radiography examination of the respondent show that 409(60.01%) , 250(36.8%), and 21(3.1%) MDR TB patient had bilateral cavitations, unilateral cavitations and abnormality (x-ray without cavitations) respectively. Regarding co morbidity, 238(35.0%).107(15.7%), 876(12.8%) and 46(6.8%) respondents had previous PTB, previous HIV, HIV and other disease such as d Diabetic Miletus and hypertension respectively. The rest MDR –TB patients 203(22.9%) respondents did have any co morbidity. Among MDR TB patients accounting for 571 (84%), (15.6% and, 3(.4%) were Pulmonary TB, Extra pulmonary TB and both PTB and EPTB respectively (Table2)

Table 2. Distribution of MDR-TB treatment regimen at st. peter TB Specialized hospital during January 2011 to December 2013.

Variables	Frequency	Percent (%)
treatment regimen		
standard regimen	586	86.3
individual regimen	91	13.4
Empirical treatment	2	0.3
use of second line drug		
no	628	91.9
yes	52	8.1
MDR contact History		
no	497	73.2
yes	182	26.8
x-ray result		
Bilateral cavitations	409	60.1
unilateral cavitations	250	36.8
Abnormal x-ray without cavitations	21	3.1
patient co morbidity		
previous TB	238	35.0
Previous HIV	107	15.7
HIV	86	12.6
Other such as DM, HPN	46	6.8
Non	203	29.9
Type of TB		
PTB	571	84
EPTB	106	15.6
Both PTB and EPTB	3	0.4

As shown in Figure 1: treatment outcomes were assessed for 680 MDR TB patients who take category four anti-TB medication based on national standard programmers of which 274((40.1%) were cured while 148(21.7% complete treatment. Conversely, 105(15.4%), 14(2%), 9(1.3%) and 8(1.2%) were died, failed, defaulted and transfer out respectively. The rest 122(17.9%) MDR – TB patients were on treatment in which their treatment period overlaps in the third year period of this study, since MDR-TB treatment period takes 18- 24 months. Almost all of MDR-TB patient initiate their treatment after their sputum smear and sputum culture were positive for tubercle bacilli.

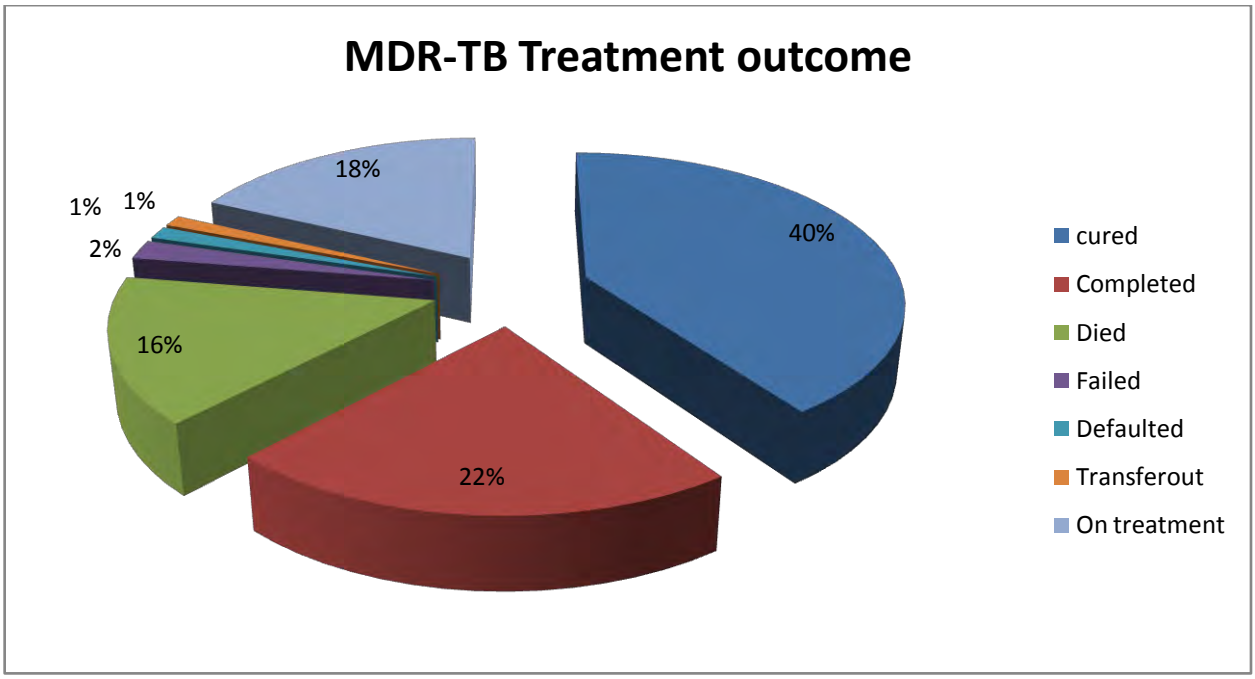

Figure 1: Distribution of MDR TB patient treatment outcome among MDR TB patient at St, Petro's hospital, Addis Ababa, Ethiopia, January 2011 to December 2013(n=680).

Most common treatment of MDR-TB patients were standard treatment regimen 586(86.2%).

Out of 586 MDR TB patient who treated with standardize regimen, accounting for 279(48%) were men while 307(52%) were female. Similarly, 37(40%) men respondents were on individualized regimen while 54(60%) female respondents were on individualized treatment regimen that account for 91(13.4%), The empirical treatment regimen were given for two MDR TB female patients (Figure2).

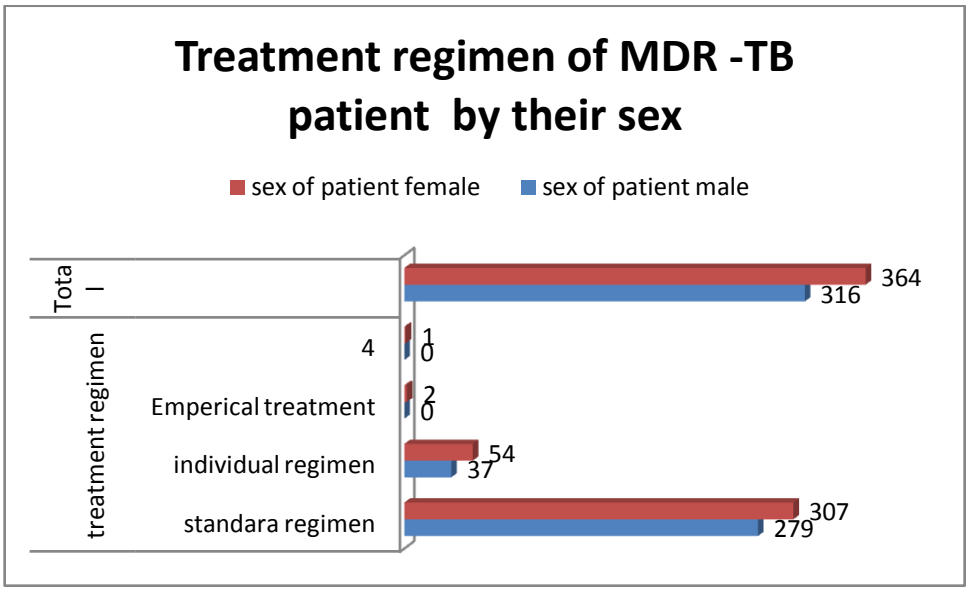

Figure 2: Distribution of MDR TB patient treatment regimen among MDR TB patient at St, Petro's hospital, Addis Ababa, Ethiopia, January 2011 to December 2013(n=680).

After adjusting for potential confounders in the final multiple regression models, co morbidity were signify cantly associated with unsuccessful outcome as comparable to the non co morbid MDR TB patient. Those MDR TB patients with chronic illness such as diabetic mellitus and hypertension were 38 %. likely to success treatment outcome. Moreover, the success rates were significantly higher among standardizes regimen and individualized regimen. Those who treated with standardize treatment regimen were 3.8 times success treatment outcome compared to empirically treat. Those who treated with individualized treatment regimen were 4 times success treatment outcome compared with empirically treated MDR TB patient .Conversely, there were

not significant association between socio-demographic, other clinical character and MDR TB treatment success.

Among the 586 MDRTB patients who received the standardized regimen, a success outcome (cured or completed treatment) was achieved by 75% versus 76% success outcome for patients who received individualized regimens (Table 3).

Table 3: Demographic and clinical characteristics by treatment outcome of MDR TB patient at St. Petro's hospital, Addis Ababa, Ethiopia .2014(n=558)

Characteristics	Treatment outcome success		Crude OR(95%CI)	Adjusted OR (95%CI)
	Yes	No		
Sex				
Male	200	68	0.34(0.26,0.45)	0.884(.0585,1.338)
Female	222	68	1	1
Age				
<20	33	12	0.364(0.i88,0.704)	0.787(0.341,1.87)
20=40	300	97	0.323(0.257,0.407)	0.97(0.57,1.57)
>40	89	27	1	1
Use of second line drug				
No	394	129	0.33(0.21,0.39)	0.71(0.29,1.69)
Yes	28	7	1	1
MDR TB contact	310	99	0.32(0.25,0.40)	1.07(0.68,1.69)
No	112	37	1	1
Yes				
Co morbidity				
Previous TB	133	51	0.22(0.12,0.39)	0.73(0.45,1.17)
Previous HIV	64	14	0.25(0.13,0.45)	1.21(0.61,2.39)
Others chronic illness like	53	13	0.67(0.36,1.25)	1.07(0.52,2.17)
DM,HPN	24	16	0.28(0.20,0.40)	0.39(0.19,0.82)
Non	148	42	1	1
Treatment regimen				
Standard	184	119	0.327(0.28,0.40)	3.83?(2.11, 5.96)
Individualized	55	17	0.31(0.18,0.53)	4.09(4.09, 4.09)
	2	0	1	1

6. Discussion

The study showed that the prevalence of MDR-TB seemed to be very high, i.e., 38.8% among MDR TB patients This study was in accordance with the study in India that had 39.8%

prevalence rate(19). Such high prevalence may be because of high frequency of chronic cases (relapse, failure, re-treatment).The median age of this research was 29 years (inter-quartile range 24-37) .It was similar to the study conducted Dominican Republic that was 31years(inter-quartile24.5 - 40) (10). This indicates that MDR TB affects the productive age group.

In this study there were an increased trend of MDR –TB patient number from 22.9% in 2011 to 43.5% in 2012 and then to 48% in 2013. This result was similar to the study conducted in India that show Continuous increasing trend of MDR-TB from 36.4% in 2007 to. 36.7%, in 2008 and 39.1% in 2009 to 40.8% in 2010(11).

The most common co morbidity in this research was Pulmonary tuberculoses which similar to other study In which pulmonary disease was most common with sputum smear and sputum culture positive (12), On the basis of previous studies, it has become clear that MDR TB had multifaceted and that different mutations may lead to different levels of resistance. This may be the reason why for more than one-third of cases of MDR-TB, standard short-course therapy has been found to be an effective treatment (13).

Successful TB treatment outcomes in this research were 62% which was below the other research that found out 74.4 % (22). Unsuccessful outcomes, defined as failure and treatment interruption, are strong predictors of MDR but other outcomes, such as death, loss to follow-up, transfer-out, or those for whom the outcome is unknown, contribute to the low threshold level of success. A valid estimate of these outcomes is essential in evaluating TB control programmers as well as in suggesting adequate corrections (14).

There was a strong association between treatment regimen and success treatment outcome of MDR-TB patient. This was in accordance with other study indicating that treatment regimen

were associated with successful treatment outcome in patients diagnosed with multidrug-resistant tuberculosis (15). In this research studied lung cavitations (unilateral and bilateral) were presented on chest radiograph in 96.9% of MDR-TB patients and less than 3.1% received adjuvant surgical management, in other similar research studied lung cavitations (unilateral and bilateral) were presented on chest radiograph in 79% of MDR-TB patients and less than 21% adjuvant surgical management Latvia(22)

In this research there were a strong association between MDR TB co morbidity and success treatment outcome in which co morbidity increases unsuccessful treatment outcome. This was similar to other study (16).This might be due to susceptibility to acquire infection easily.

Therefore; MDR TB patients require close attention in early detection and controlling co morbidity as much as possible for the ware fare of their life.

7. Limitation of the study

The cannot be generalize the general population because of data were collected from hospital routine data.

The current study was subject to several limitations, mainly due to use of routine data and resource constraints.

Some key information, such as the number of drugs to which each patient was resistant and other Potential risk factors, is missing, and data on specific causes of death or default during treatment were unavailable. However, other typical factors associated with worse outcome in MDR-TB management were studied.

The study population does not contain full clinical or treatment details in their record; thus it was unable to provide details information about MDR TB patient;

The study may be not Express the exact current status of St. Peter TB specialized referral Hospital. The medical record was in complete to assess the full social-demographic characteristics of the target patients. The disorganized of the medical record registration log books was reducing the accuracy of the result.

8. Strength of the study

The check list was modified and data collected both from medical records, treatment charts, bacteriological reports, radiological reports and drug side effects.

The dual data entering, cleaning was employed to increase data quality.

9. Conclusion and recommendation

9.1 Conclusion

MDR TB prevalence increase from time to time as the study showed that 22.9% in 2011 to 48% in 2013, there were also strong association between the contracting co infection and MDRTB unsuccessful outcome.

There was a strong association between treatment regimen and success treatment outcome of MDR-TB patient.

Therefore; based on program me conditions and with effective standardized treatment, successful, low-cost MDR-TB management can be achieved even in resource-constrained settings with high initial MDR-TB rates.

TB patients with 'clinically suspected' MDR -TB cases must not be overlooked, so there is need for surveillance of emerging and increasing trend of MDR-TB and to optimize patient management accordingly.

9.2 Recommendation

Transmission of MDR-TB strains within a community is a serious problem, and it has to be tackled seriously, so that we can reduce prevalence of MDR-TB.

Culture and DST for patients with 'clinically suspected' DR-TB cases must not be overlooked, so there is need for surveillance of emerging and increasing trend of MDR-TB and to optimize patient management accordingly.

The use of rapid, sensitive and specific methods for detecting MDR-TB must be recommended to combat the problem of MDR-TB.

Further study will be recommended to highlights the need to make useful strategies for testing, surveillance and effective clinical management of MDR-TB cases.

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ANNEXES

Annex1. CONSENT FORM AND INFORMATION SHEET

I. Information sheet

Addis Ababa University Allied Health Science College centralized school of Nursing and Midwifery Graduate studies program .Here, I the undersigned at Addis Ababa University department of Maternity and Reproductive health MSC in Nursing, currently I will be undertaking a research topic on entitled as assess MDR-TB patients and its treatment outcomes among tuberculosis patients Attending in St. peter TB Specialized Hospital in Addis Ababa.

II. Introduction (purpose)

This information sheet and consent form prepared by the principal investigator whose aim is to study the prevalence of MDR-TB patients and who are tuberculosis too. The principal investigator is masters of Science degree student on maternity and reproductive health in nursing.

THE PUPOSE OF THE STUDY:- is to assess MDR-TB patients and its treatment outcomes among tuberculosis patients attending in St peter Hospital. The Hospital will use as the line information for further intervention. The overall aim of the study is to improve the health of the people in general and helpful to assess MDR-TB patients and its treatment outcomes among tuberculosis patients in St. Peter TB Hospital. The study will give new insight about MDR-TB for the hospital generally. All information obtained from the medical registration log books about the study subjects.

Procedure of selection:- all MDR-TB registration log book from January 1,2011 to end of December 2013 orderly review.

Risk: - The study will be covered three year MDR-TB patients enrolled in the past it difficult to get reality data and consumed much time.

Benefit:- the study will be inputs to improve the data registration system and strengthened the treatment of MDR-TB and also prevent further drug resistance. Reducing the transmission of MDR-TB in households and in the hospital.

CONFIDENTIALITY:- All information you give will be kept confidential and won‟t be accessible to any third party. Your name won‟t be registered on the question sheet so that you will not be identified.

III. Consent Form

The check list should be filled by trained data collectors. The investigator should followed and communicated information. The data collectors are requested to take complete and real information about MDR-TB status of the registered patients in St. Peter Hospital.

Investigator Researcher Contact Address

Gashaw Mequanint

Tel:- 0913328615

E-Mail:- gashawmeq@yahoo.com

Dear participant /or Data collectors!

I am going to ask you few questions about your willingness to participate this study. After the following statement is read to you or yourself read it, please give your response as either I agree

or I disagree to participate in the study. You may confirm your agreement or disagreement by either giving your signed or verbal consent in the respective space give below.

I the undersigned participate , given that I read all relevant information concerning the purpose of this particular study participants to be included, the procedure of selection the study participate, the study procedure, benefits, the withdraw effect on the service provided, consent and confidentiality or read and explain to me, I decided to agree/ or disagree to participate in the respective study mentioned above. (please put your signature in the respective space provided below or your verbal consent.

Data collector Name:- ----------

Signature: ----------

Date:----------

CONSENT FORM

DATE……/…….|……

This is a survey planned to assess the prevalence of MDR-TB and treatment outcome among tuberculosis patients at St. Peter TB Hospital. The findings will be distributed to all stakeholders the prevalence of MDR-TB improve the patients health are addressed. So that you willing to respond the following questions?

Yes…… No……..

If willing confirm with signature……..

.

Annex2. Data Collection Tool

This questionnaire is designed to assess MDR-TB patients and its treatment outcomes among tuberculosis patients attending in St. Peter TB specialized referral Hospital.

Part 1:- Questions for socio-demographic variables of the study group.

1.1.Address of the patient	1. Addis Ababa 2. Outside Addis Ababa
1.2.Age of the patient in year	……..
1.3.Sex of the patient	1. Male 2. Female
1.4.Religious of the patient	1.Orthodox 2Muslim 3.Catholic 4.Protestant 5. Others----------
1.5.Ethnicity of the patient	1.Amhara 2. Oromo 3.Tigre 4. Gurage 5. Others----------
1.6.Marital status of the patient	1. Married 2. Single 3.Divorced 4.Widowed
1.7.Educational status of the patient	1. Illiterate 2. Read and write 3. Elementary school 4. junior high school 5. High school 6. College diplo and above
1.8.Occupational status of the patient	1. Governmental employee 2. Non-governmental employe 3. Daily labor 4. Owner private 5. Others----------
1.9.Income level of the patient	1. <600 2. 601-1300 3. 1301-2100 4. 2101-2800 5. 2801-3500 6. >3501

Part II. The check list of different MDR-TB registration formats

2. The recording formats forms	
2.1 MDR-TB treatment card(form 01)	1. Completely filled 2.partialy filled 3. Not filled
2.2 MDR-TB register (form 02)	1. Completely filled 2. Partially filled 3. Not filled
2.3 Request for sputum examination(form 03)	1. Completely filled 2. Partially filled 3. Not filled
2.4 Laboratory register for culture & DST(form 04)	1. Completely filled 2. Partially filled 3. Not filled
2.5 Laboratory register (form 05)	1. Completely filled 2. Partially filled 3.not filled
3. Reporting formats	
3.1. Quarterly report on MDR-TB case finding(form 05)	1. Completely filled 2. Partially filled 3. Not filled
3.2. Quarterly report on MDR-TB case Enrolment(form 06)	1. Completely filled 2. Partially filled 3. Not filled

3.3. Six month interim outcome Assessment 0f confirmed MDR-TB cases(form 07)	1. Completely filled 2. Partially filled 3. Not filled
3.4. Final report of treatment result of confirmed MDR-TB patients(form 08)	1. Completely filled 2. Partially filled 3. Not filled
4. Additional formats	
4.1. MDR-TB suspect register	1. Completely filled 2. partially filled 3. Not filled
4.2. MDR-TB treatment follow up register	1. Completely filled 2. Partially filled 3. Not filled
4.3. Treatment supporter card	1. Completely filled 2. Partiall filled 3. Not filled
4.4. Monthly MDR-TB Treatment follow up reporting format	1. Completely filled 2. Partially filled 3. Not filled

Part iii. Questionnaire related to clinical outcome of the study variable groups.

1. MDR-TB patient treatment started date……/……/…….
2. Registration category of MDR-TB disease.

1. Category I 2. Category II 3. Category III 4. Category IV 5. Category V

3. MDR-TB patients" treatment regimens

1. Standard regimen 2. Individual regimen 3. Empirical treatment

4. Did you use the second line drug in the past?

1. No 2. Yes

5. Did you MDR-TB patient contact history in the past?

1. No 2. Yes

6. Microbiological/Microscopic examination results

1. Positive 2. Negative

7. Laboratory examination of culture results

1. Positive 2. Negative

8. Radiological (x-ray) results of the patient

1. Unilateral cavitary 2. Bilateral cavitary 3. Abnormality (x-ray) without cavitary

9. Co morbidity of MDR-TB patients

1. Previous TB 2. Previous HIV 3. Current HIV 4. Others such as DM, HPN…

5. None co morbidity

10. MDR-TB disease site/type

1. PTB 2. EPTB 3. PTB and EPTB

Declaration

I the undersigned, the declare this proposal is my original work has never been presented in this or any university and agree to accepted all responsibilities for the scientific and ethical conducts of the research proposal .I will provide timely progress report to my Advisor MS. Zuriyash Mengistu and seek the Advice and that I communicated stakeholders involved in the study including any source of the findings for this research.

Name: Gashaw Mequanint (B.SC)

Signature:_____

Place: Addis Ababa University

Date of submission: February 2014 G.C

This proposal has been submitted for examination with my approval as a University Advisor.

Name:- MS. Zuriyash Mengistu (RN, BSC, MSC)

Signature:_____

Date:_____