

INCIDENCE OF TUBERCULOSIS IN DIABETIC PATIENTS

Abstract

Tuberculosis is an infectious disease, which is caused by bacteria. The disease is mostly transmitted from person to person, usually by inhaling ^{nomenclature} bacteria-carrying air droplets. Tuberculosis most commonly affects the lungs, but it can also affect any other organ. The infection doesn't always result in disease. The human immune cells can check and control pathogens, so that progression to disease only occurs in about 10% of adults. However the ^{mention} infection may remain latent and can reactive at any time, also after decades if e.g. the immune system is weakened. If left untreated, tuberculosis is a life-threatening illness.

The most commonly used diagnostic tool ^{Smear microscopy??} for tuberculosis is a simple skin test, though blood tests ^{No blood test for TB??} are becoming more commonplace. A small amount of a substance called PPD tuberculin is injected just below the skin of your inside forearm. You should feel only a slight needle prick.

Introduction

Tuberculosis (TB) is a disease caused by bacteria called ^{nomenclature??} Mycobacterium tuberculosis. The bacteria usually attack the lungs, but they can also damage other parts of the body[1].

^{the germ, not the disease:} TB spreads through the air when a person with TB of the lungs or throat coughs, sneezes, or talks. If you have been exposed, you should go to your doctor for tests. You are more likely to ^{remove 18 and 19} get TB if you have a weak immune system[2].

If a ^{germ} tuberculosis infection does become active, it most commonly involves the lungs (in about 90% of cases) Symptoms may include chest pain and a prolonged cough producing sputum. About 25% of people may not have any symptoms (i.e. they remain "asymptomatic"). Occasionally, people may cough up blood in small amounts, and in very rare cases, the infection may erode into the pulmonary artery or a Rasmussen's aneurysm, resulting in massive bleeding[3]. Tuberculosis may become a chronic illness and cause extensive scarring in the

upper lobes of the lungs. The upper lung lobes are more frequently affected by tuberculosis than the lower ones. The reason for this difference is not clear. It may be due to either better air flow, or poor lymph drainage within the upper lungs[4].

Extra-pulmonary Tuberculosis

In 15–20% of active cases, the infection spreads outside the lungs, causing other kinds of TB. These are collectively denoted as "extra-pulmonary tuberculosis". Extra-pulmonary TB occurs more commonly in immuno-suppressed persons and young children. In those with HIV, this occurs in more than 50% of cases[5]. Notable extra-pulmonary infection sites include the pleura (in Tuberculous pleurisy), the central nervous system (in tuberculous meningitis), the lymphatic system (in scrofula of the neck), the genitourinary system (in urogenital tuberculosis), and the bones and joints (in Pott disease of the spine), among others. When it spreads to the bones, it is also known as "osseous tuberculosis", a form of osteomyelitis[6]. Sometimes, bursting of a tubercular abscess through skin results in tuberculous ulcer. An ulcer originating from nearby infected lymph node is painless, slowly enlarging and has an appearance of "wash leather". A potentially more serious, widespread form of TB is called "disseminated tuberculosis", also known as miliary tuberculosis. Miliary TB makes up about 10% of extrapulmonary cases[7].

Drug-resistant Tuberculosis

Another reason tuberculosis remains a major killer is the increase in drug-resistant strains of the bacterium. Since the first antibiotics were used to fight tuberculosis more than 60 years ago, some TB germs have developed the ability to survive, and that ability gets passed on to their descendants[8].

Drug-resistant strains of tuberculosis emerge when an antibiotic fails to kill all of the bacteria it targets. The surviving bacteria become resistant to that particular drug and frequently other antibiotics as well. Some TB ^{name of germ} bacteria have developed resistance to the most commonly used treatments, such as isoniazid and rifampin[9].

Some strains of TB have also developed resistance to drugs less commonly used in TB treatment, such as the antibiotics known as fluoroquinolones, and injectable medications including

54 amikacin, kanamycin and capreomycin. These medications are often used to treat infections that
55 are resistant to the more commonly used drugs[10].

56 Diabetes is when your blood glucose, also called blood sugar, is too high. Blood glucose is the
57 main type of sugar found in your blood and your main source of energy. Glucose comes from the
58 food you eat and is made in your liver and muscles. Your blood carries glucose to all of your
59 body's cells to use for energy.

60 Your pancreas—an organ, located between your stomach and spine, that helps with digestion—
61 releases a hormone it makes, called insulin, into your blood. Insulin helps your blood carry
62 glucose to all your body's cells. Sometimes your body doesn't make enough insulin or the
63 insulin doesn't work the way it should. Glucose then stays in your blood and doesn't reach your
64 cells. Your blood glucose levels get too high and can cause diabetes or prediabetes.

65 METHODOLOGY AND RESULTS

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67 We check patients according to age groups and according to sex in diabetic and non-diabetic
68 patients. Table and number of patients are selected and check according to them.

69 We obtain all data from “Dot Unit” of “Gulab Devi Chest Hospital” and general observations
70 from different hospitals and clinic in Punjab.

71 Our study duration is about 6 months.

72 Data Analysis

73 Table 1 All cases registered during quarter (except for TB cases moved to the second line
74 treatment register)

TB PATIENT TYPE	Number of cases	Treatment out comes					
		Smear negative	Smear positive	Died	Loss of follow up	Not evaluated	Total
Bacteriologically confirmed and new	953	748	69	39	40	57	953

replase							
Clinically diagnosed new and replase	482	400	3	24	46	9	482
Extra pulmonary bacteriologically confirmed/or clinically diagnosed	241	207	0	3	28	3	241
Retreatment (excluding replase)	107	80	2	6	6	13	107
Total	1783	1435	74	72	120	82	1783

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76 Table 2 According to sex, number of diabetic and non-diabetic patients, with or without

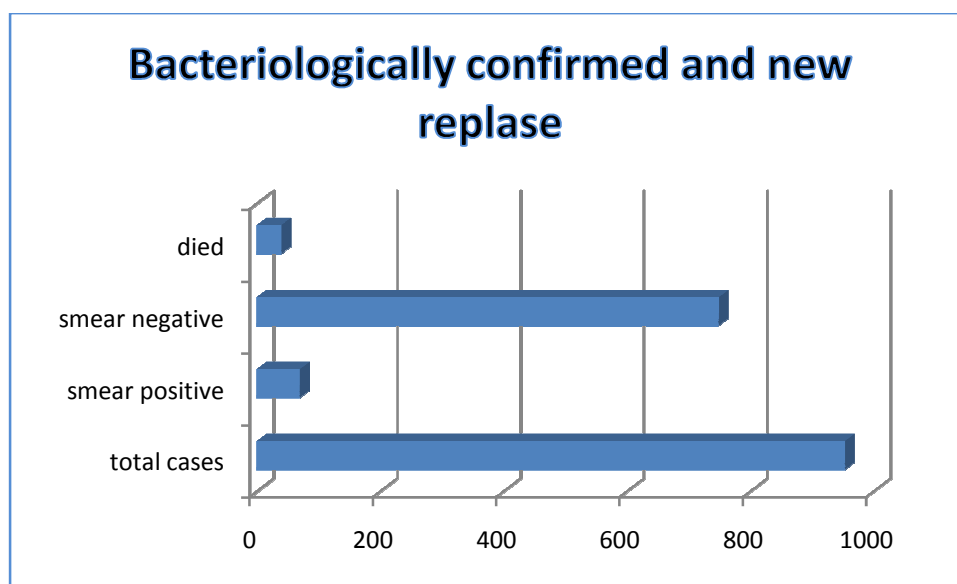
SEX	No. of Diabetic patients with tuberculosis	No. of Non-diabetic patients with tuberculosis
Male	15	20
Female	22	17

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78 Table 3 According to age group, percentages of patients with tuberculosis, diabetes and both

Age Groups	%age of patients with tuberculosis	%age of patients with Diabetes	%age of patients with tuberculosis and diabetes; both
0-17	2	4	0
18-30	42	10	2
31-60	26	35	18
61 and older	13	52	25

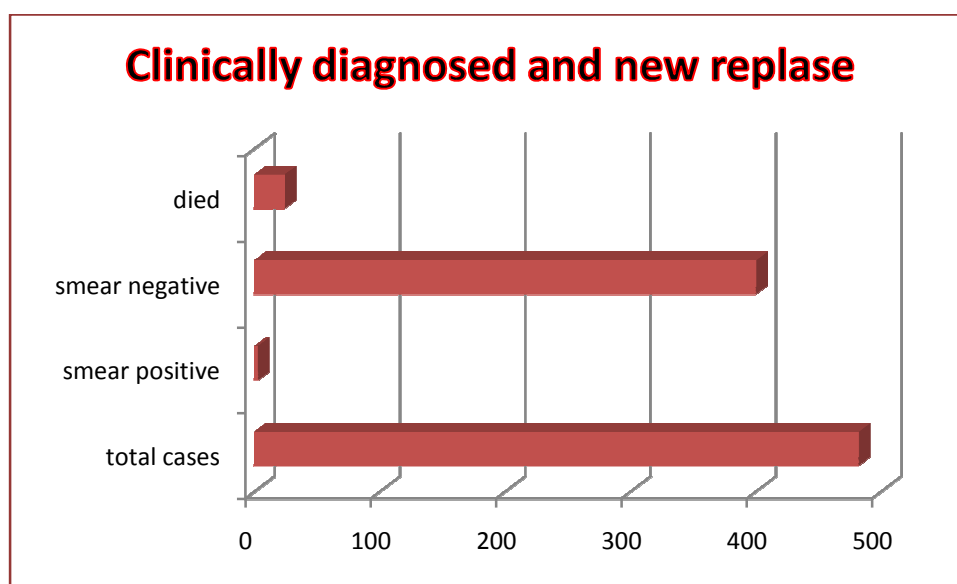
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Figure 1 Graph of Bacteriologically confirmed and new replase



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Figure 2 Graph of clinically diagnosed and replase

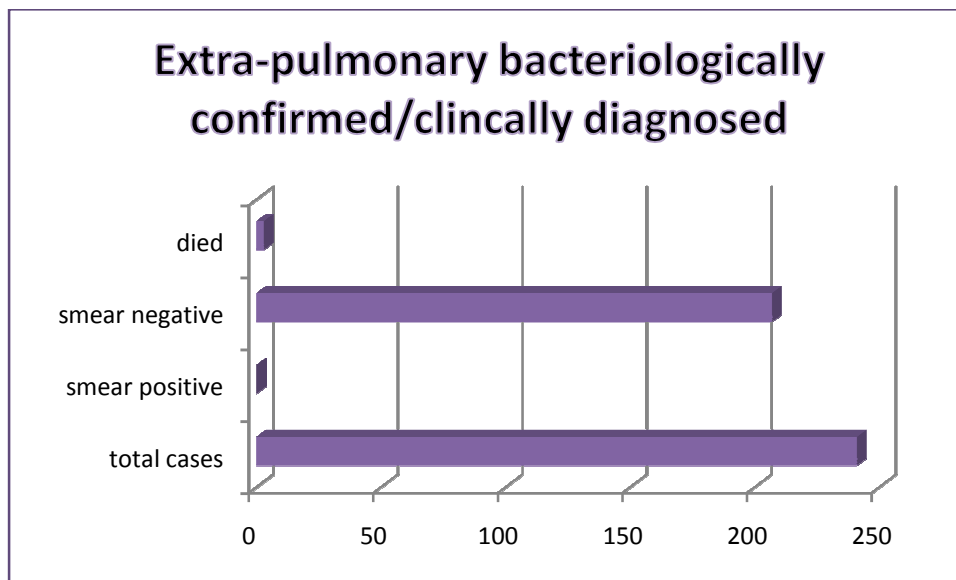


Figure 3 Graph of extra-pulmonary bacteriologically confirmed/ clinically diagnosed

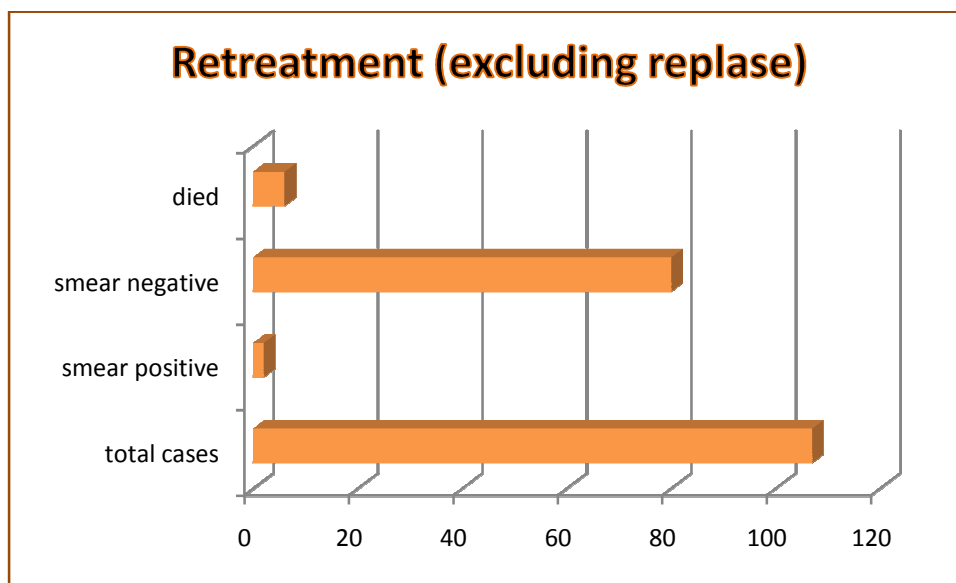


Figure 4 Graph of retreatment (excluding replase)

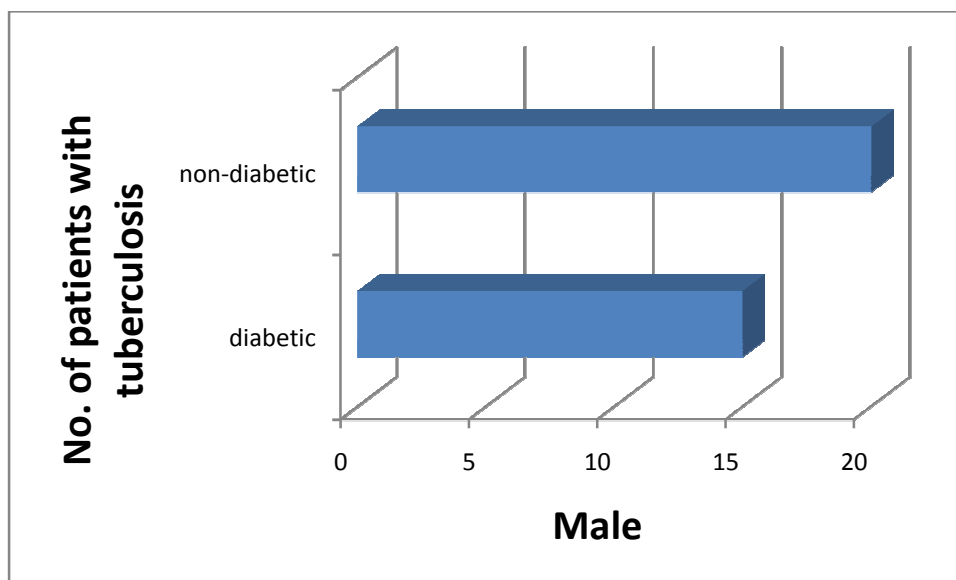


Figure 6 Graph of No. of diabetic and non-diabetic patients with tuberculosis versus male

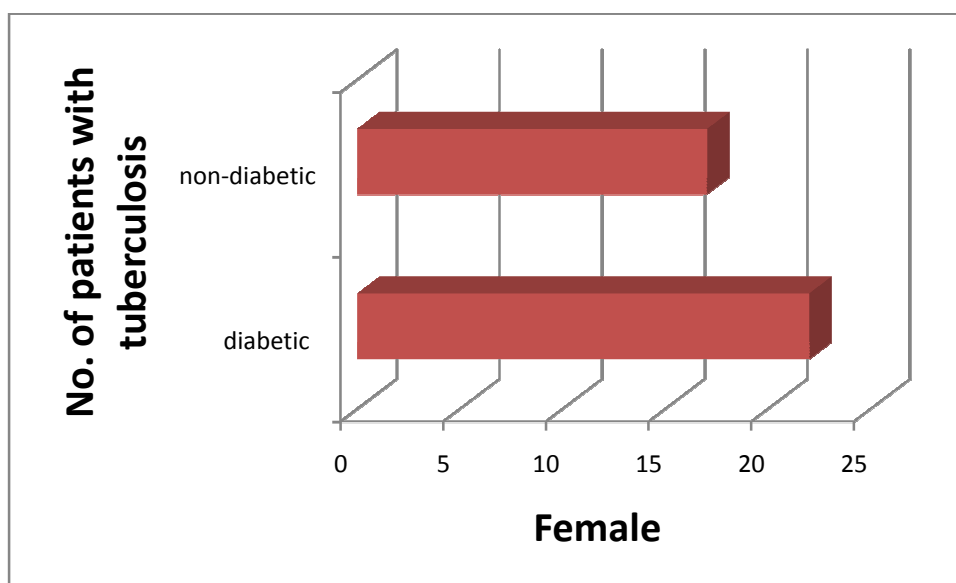


Figure 7 Graph of no. of diabetic and non-diabetic patients with tuberculosis versus female

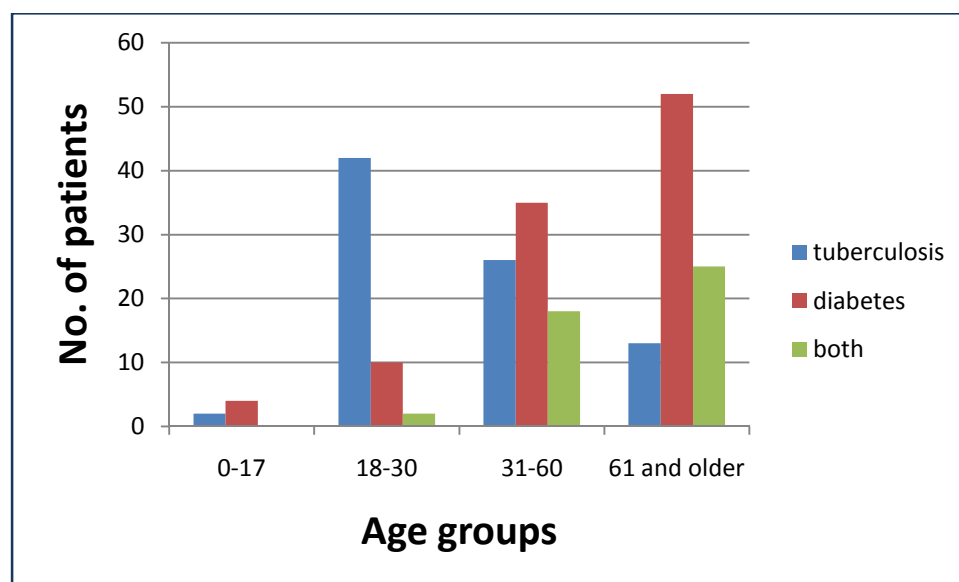


Figure 8 Graph of no. patients with age group

Conclusion

The death rate of tuberculosis in 2015 was 259 whereas in the 6th month of 2016 it was 148, which means besides of advancement still the death rate is not controlled and increasing.

The patients with diabetic disease are more in female as compare to male but the patients with non-diabetic disease are more in male than female.

According to age group; the 18-30 years patients have more chances of tuberculosis; while the 61 years and older are more chances for diabetes because their immune system is too weak.

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