

A STUDY ON TUBERCULOSIS AMONG DIABETES PATIENTS IN TERENGGANU

*Azila A, Azlin A, Azlina E, Darisah L, Kamilah M, Maira H, Mazlinah M,
Nor Kasmawati J, Norhana Y, Ranimah Y, Rohaiza AK, Rozimah AL,
Salmiah S, Shimilaaida MAJ, Siti Aminah AM, Suhazeli A,
Wan Ruzilasalwa WS, Zaleha J, Zahrni M, Zil Falilah MS*

INTRODUCTION

- Tuberculosis is one of the major public health problems and is on the rising trend.
- Chronic diseases such as diabetes result in a weaker immune system which leads to a higher risk of progression from latent to active tuberculosis¹.
- People with diabetes have a 2-3 times higher risk of tuberculosis compared to people without diabetes.
- A diabetic patient with tuberculosis has a higher mortality and failure rate during treatment and a higher rate of relapse after treatment².

OBJECTIVE

GENERAL OBJECTIVE

- To study the profile of tuberculosis among diabetes mellitus patients in Terengganu.

OBJECTIVE

SPECIFIC OBJECTIVES

1. To determine the sociodemographic pattern of patients with diabetes and tuberculosis.
2. To describe an association between risk factors and tuberculosis in diabetic patients.
3. To assess the outcome of tuberculosis among diabetic patients.

METHODOLOGY

STUDY DESIGN

- This is a descriptive study among tuberculosis patients with diabetes in Terengganu.
- Data were collected from Terengganu TB registry for patients registered within the period of January 2013 to December 2014.
- Patients' diabetic data were extracted from the TB wallet and/or diabetic card from the managing clinic.

METHODOLOGY

SAMPLE POPULATION

- Sampling method:

Universal sampling

All tuberculosis patients with diabetes mellitus registered in Terengganu TB Registry from January 2013 till December 2014 were taken as study sample.

METHODOLOGY

EXCLUSION CRITERIA

- Non Malaysian citizen
- HIV positive patients
- Patients with Gestational DM
- Patient on immunosuppressive therapy (including steroid)
- Patient with malignancy on chemotherapy
- Children less than 18 years old

RESULTS

- Out of 135 study samples recruited, only 80% (108) had complete data.

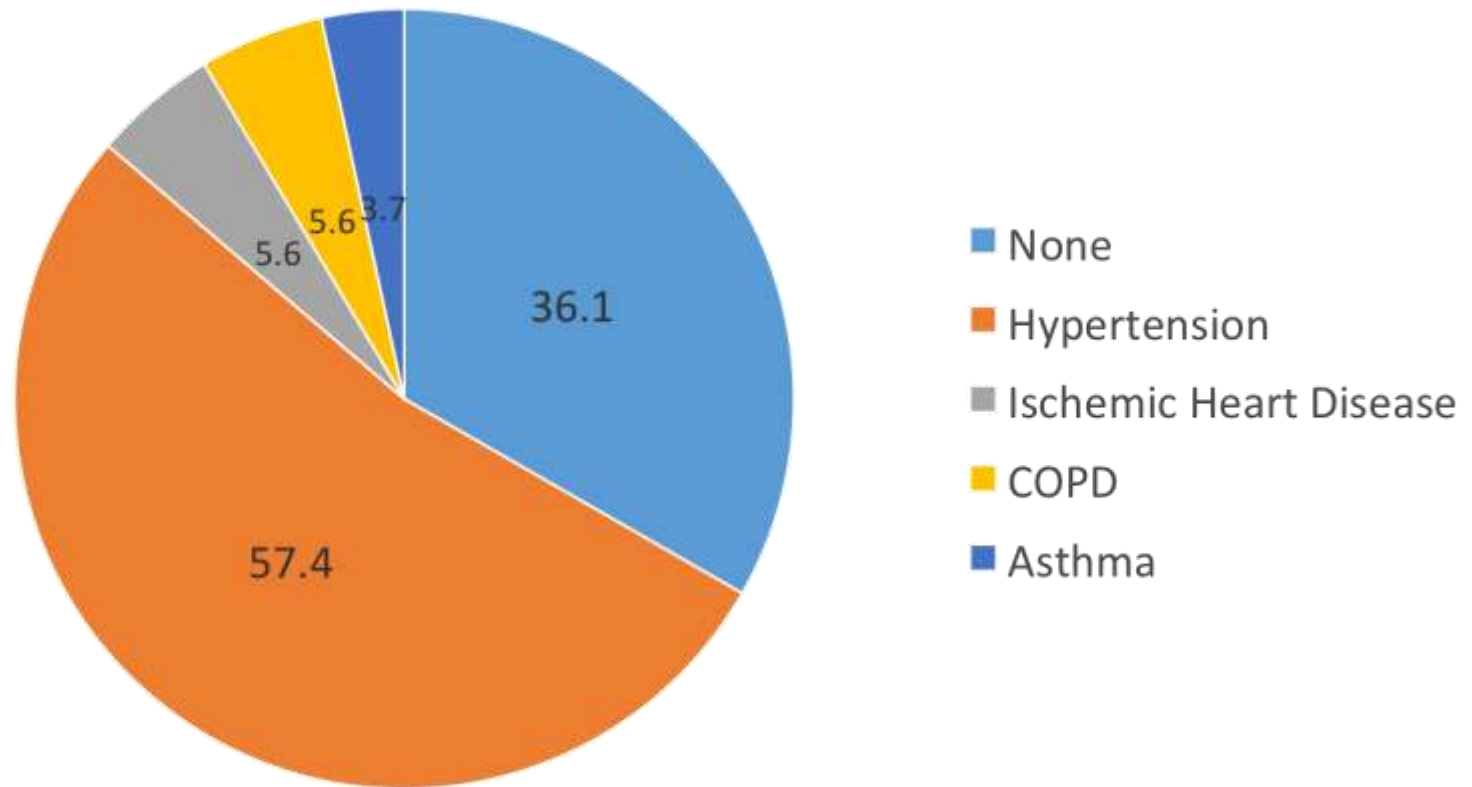
DEMOGRAPHIC DATA

VARIABLES		NO OF CASES (n= 108)	Percentage
Age (years)	Mean: 56.8 ± 10.5		
Gender	Male	71	65.7
	Female	37	34.3
Marital status	Single	3	2.8
	Married	99	91.7
	Divorcee/Widow	3	2.8
Education level	Primary	30	27.8
	Secondary	56	51.9
	Tertiary	4	3.7
	No formal education	14	13
Smoking status	Yes	44	40.7
	No	63	58.3
	Ex-smoker	1	0.9

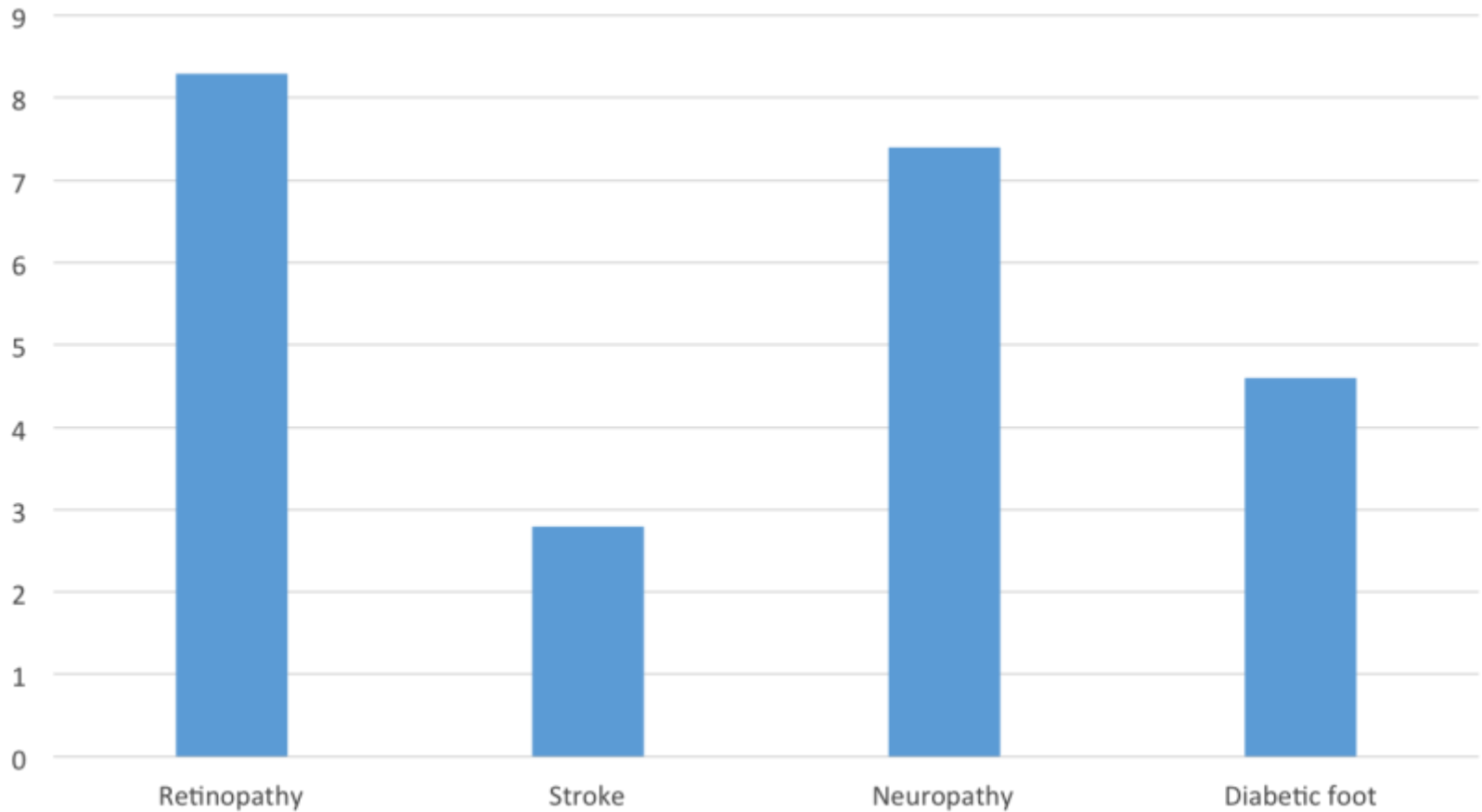
DIABETIC BASELINE DATA

VARIABLES		NO OF CASES (n= 108)	Percentage
Duration of diabetes (years)	Mean: 5.43 ± 4.15		
HbA1c (%)	Mean: 9.9 ± 2.9		
Insulin therapy	Yes	32	29.6
	No	76	70.4

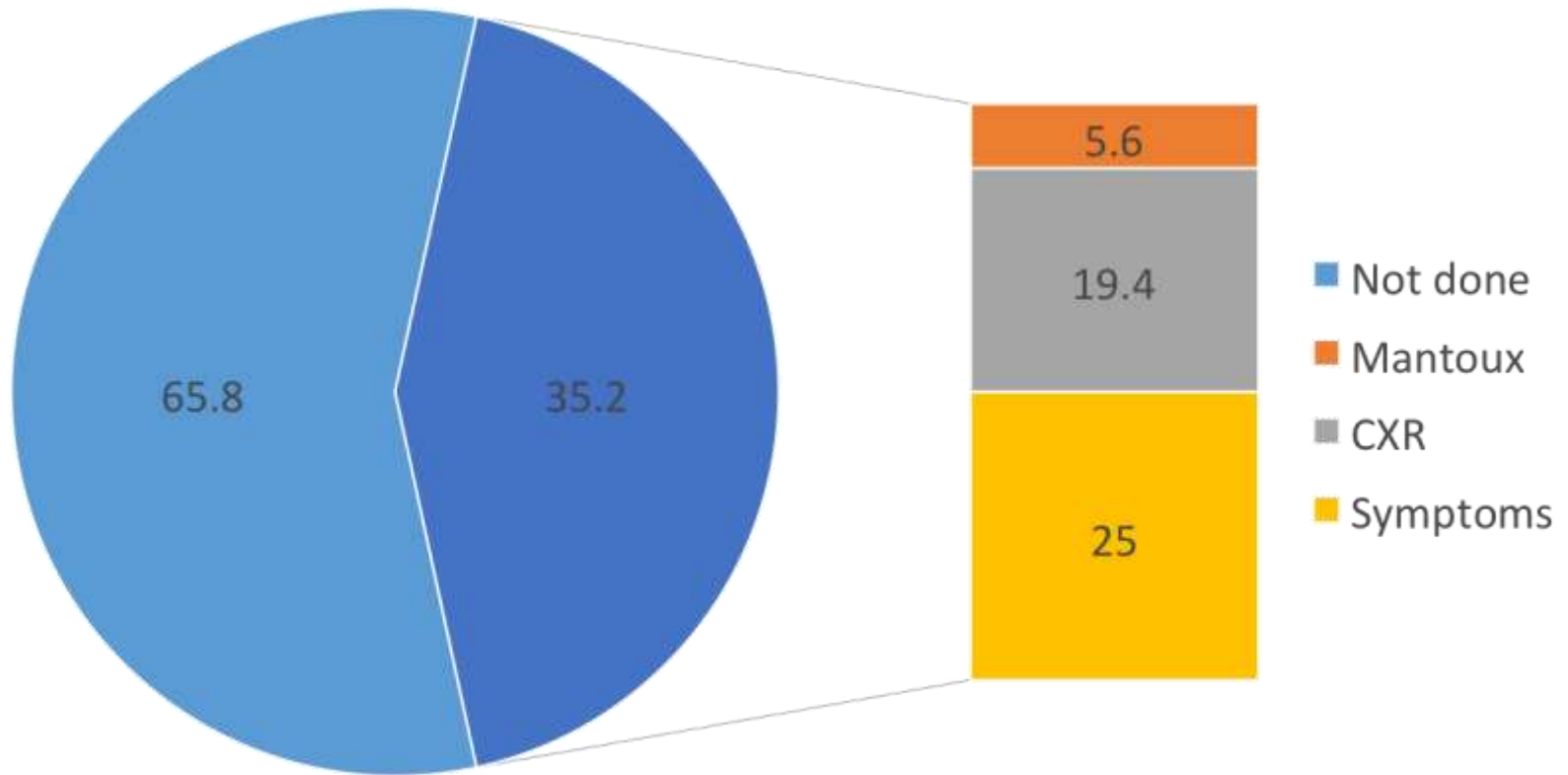
Presence of other co-morbidity



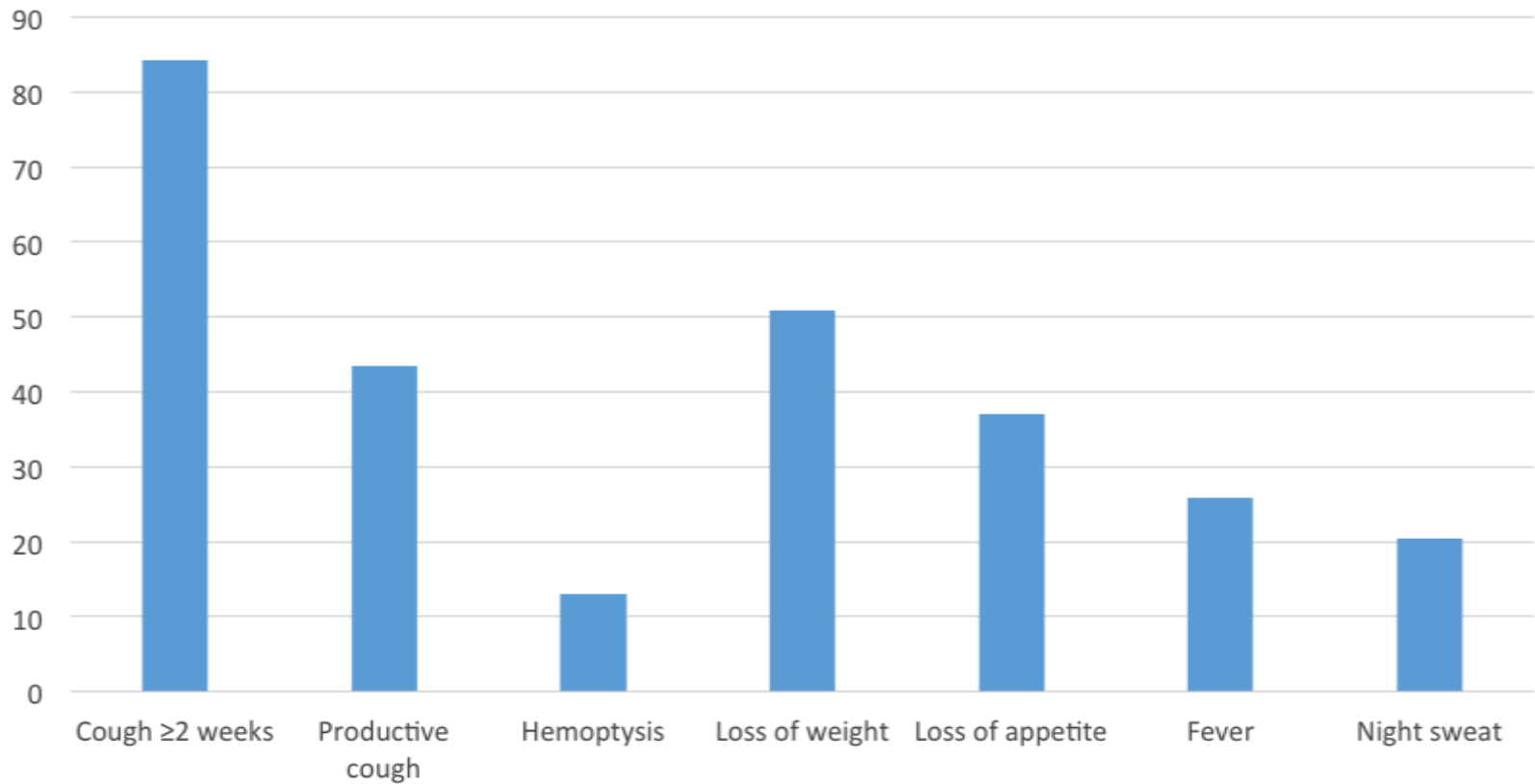
Presence of diabetic complication



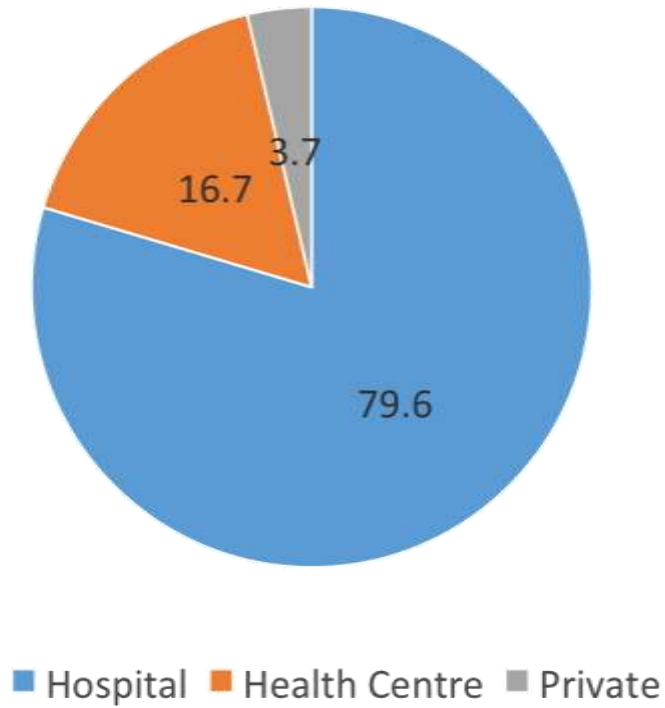
TB screening status before diagnosis



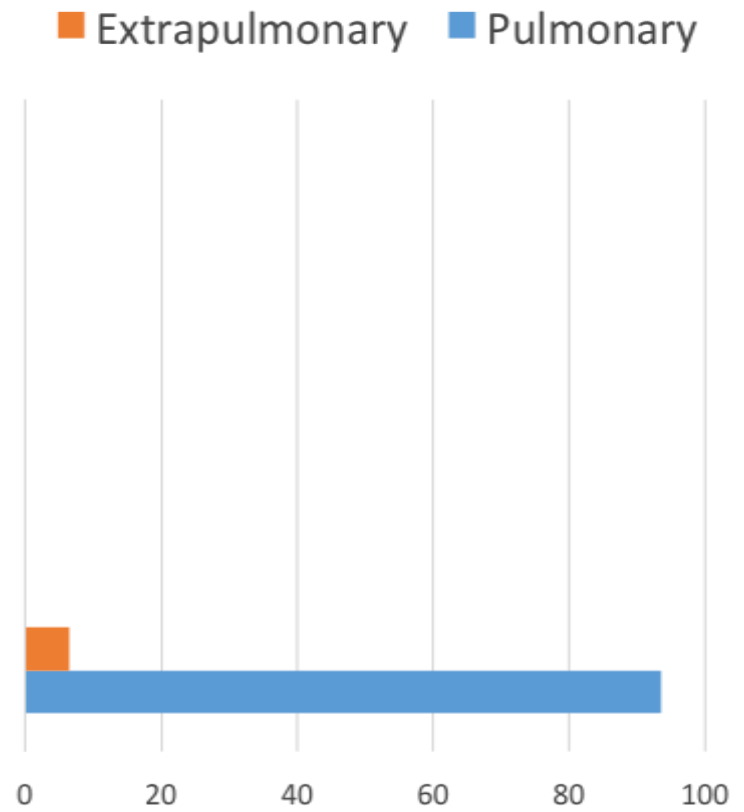
Presentation at diagnosis



Place of diagnosis

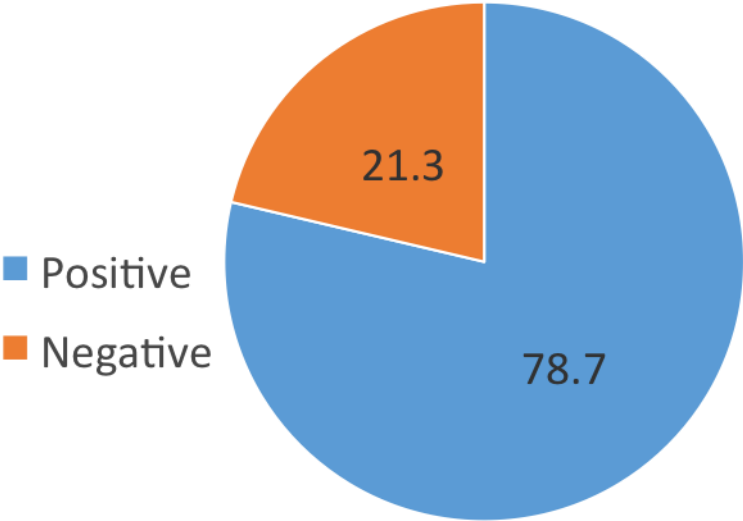


Type of TB

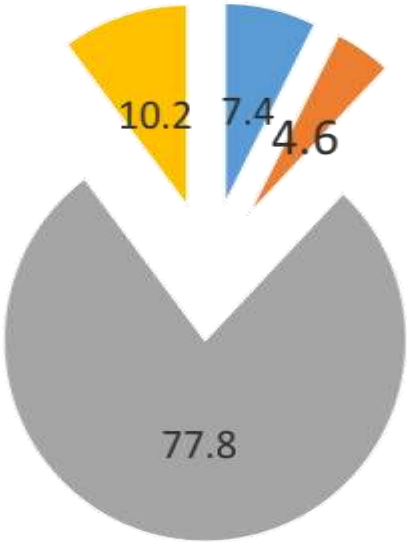


Sputum status at diagnosis

Sputum AFB

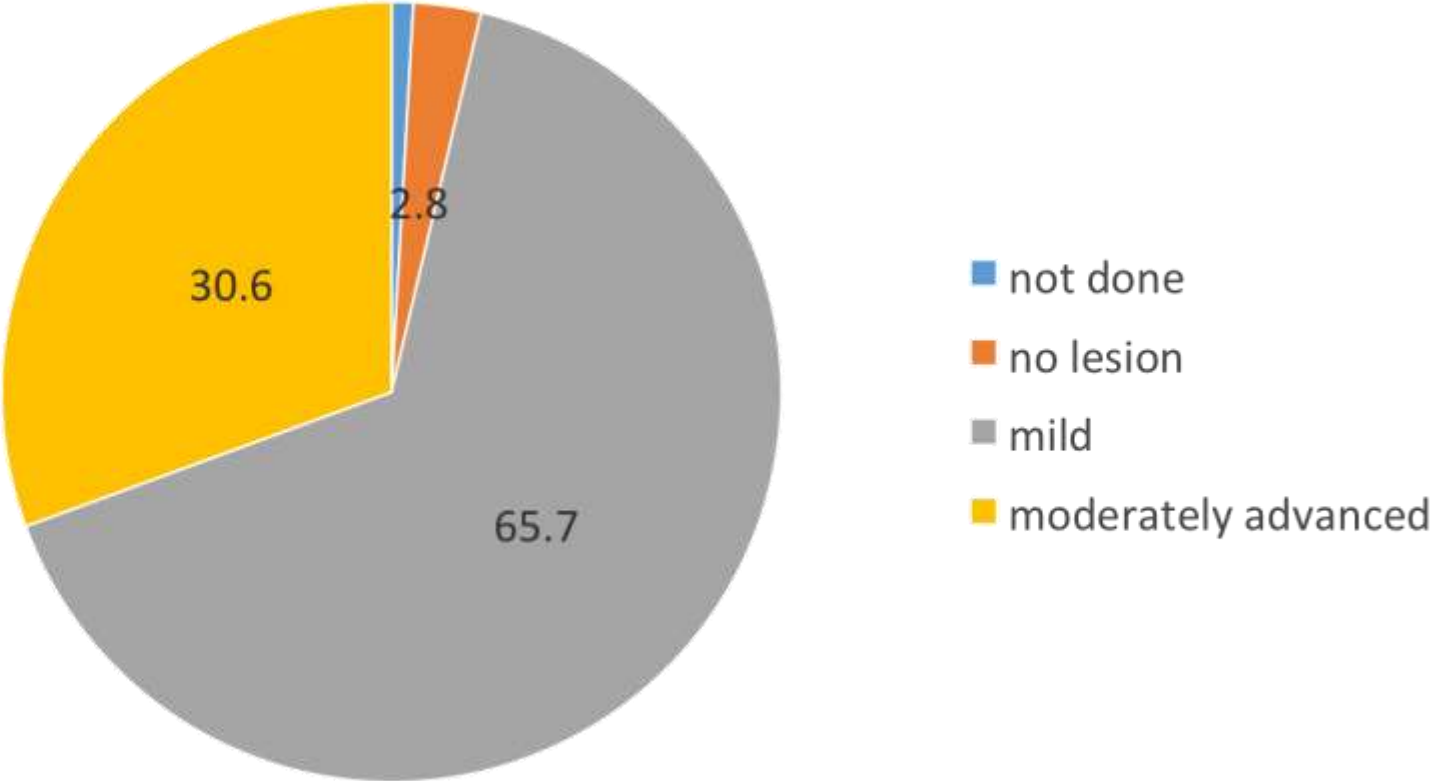


AFB culture

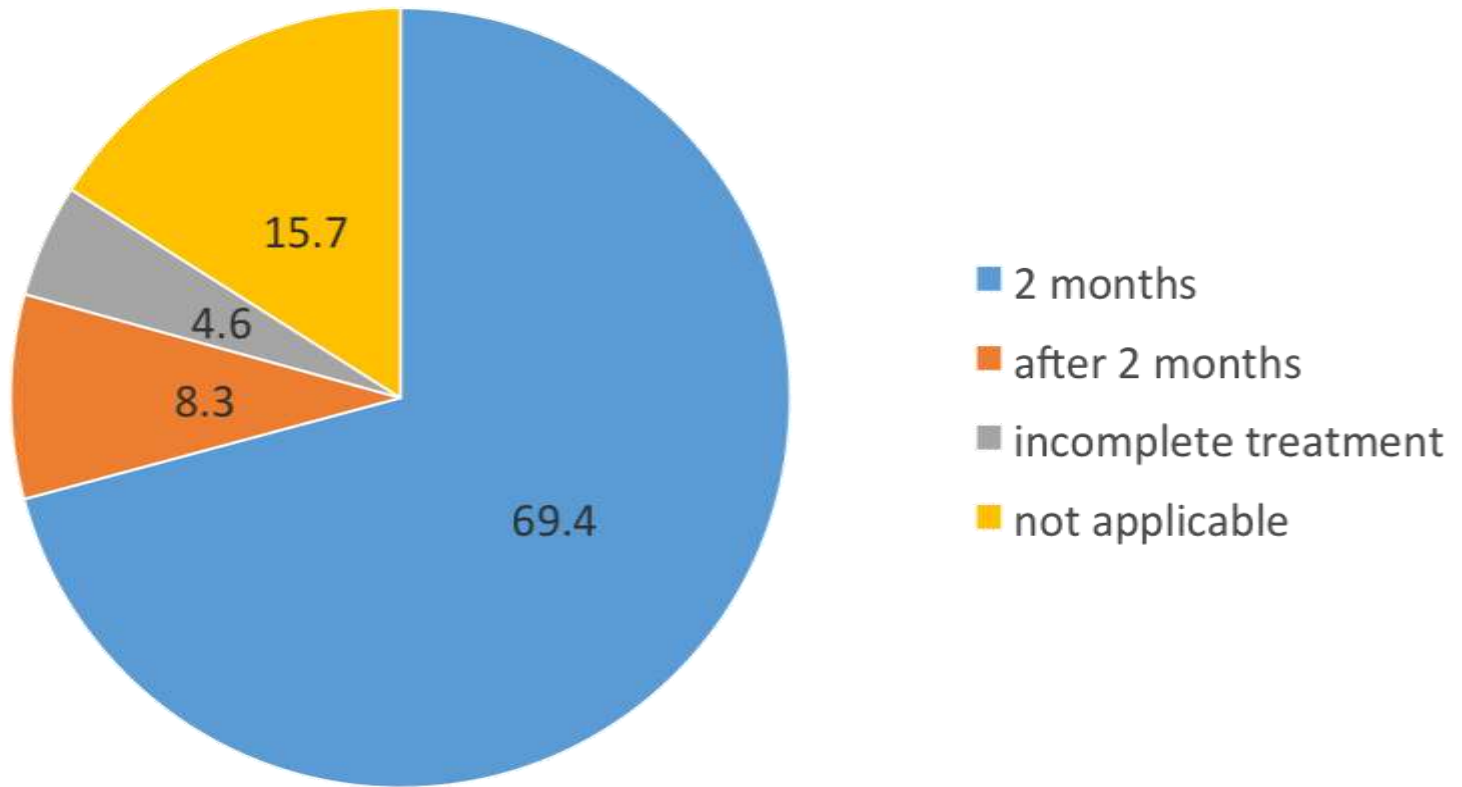


■ Not done ■ Positive ■ Negative ■ No result

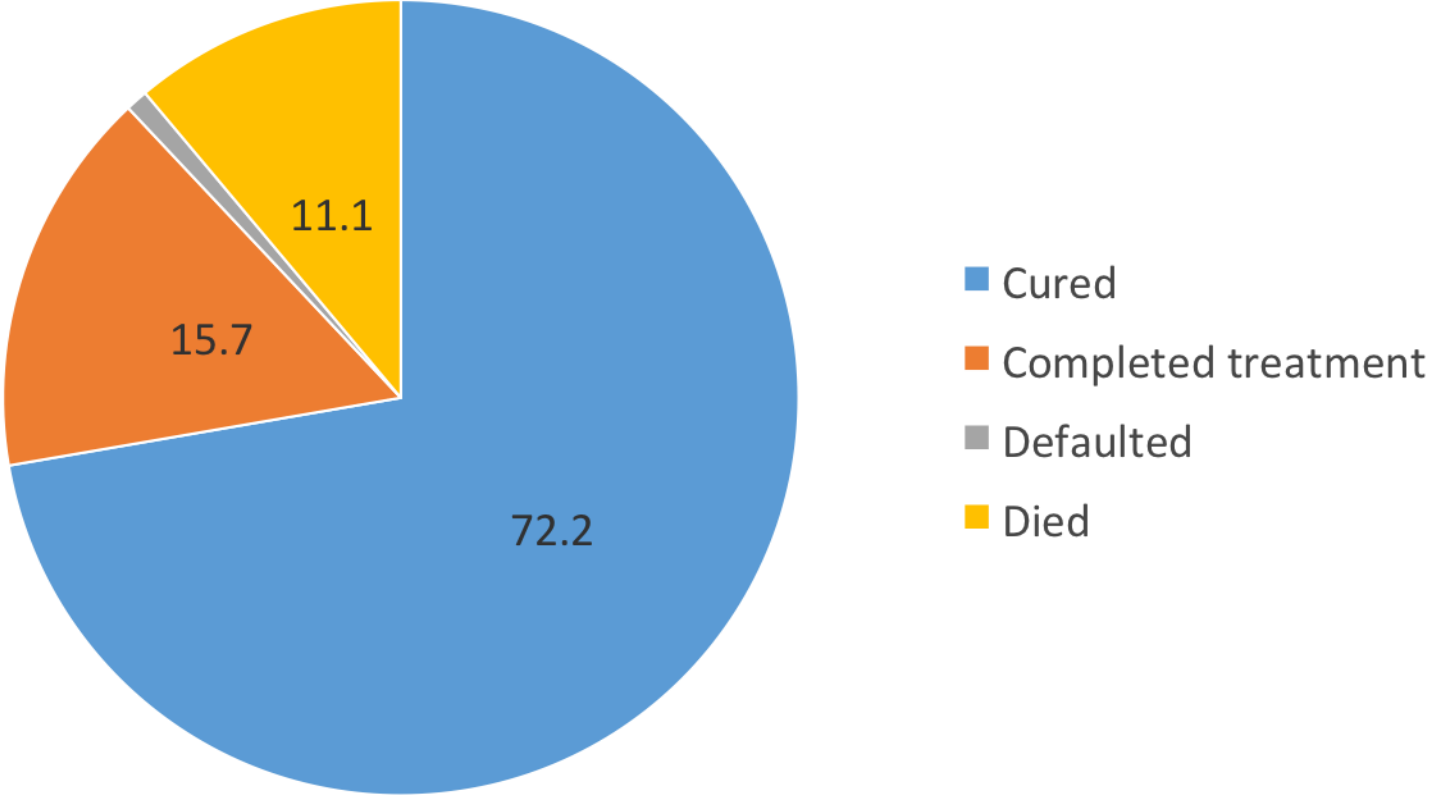
Chest radiograph findings



Timing of sputum conversion



Outcome of treatment



RESULT: Age vs. Gender

Age (years)	Gender		X ² value	p value
	Male	Female		
<50	17(65.4)	9(34.6)	0.002	0.965
≥50	54(65.9)	28(34.1)		

Table 1: Association between age and gender

Table 1 showed there is no significant association between age and gender

RESULT: Sputum conversion at 2 months

Variable	Sputum conversion n(%)		X ² value	p value
	≤ 2 months	> 2 months		
Patient with co-morbid/s	47(70.1)	20(29.9)	0.032	0.857
On Insulin treatment	22(73.3)	8(26.7)	0.134	0.714
Poor Glycaemic control	65(69.1)	29(30.9)	1.035	0.309

Table 2: Association between co-morbidity, insulin treatment, poor glycaemic control and sputum conversion

Table 2 showed there are no significant association between co-morbidity, insulin treatment, glycaemic control and sputum conversion

RESULT: Duration of tuberculosis treatment

Variable	Duration of treatment n(%)		X ² value	p value
	≤ 6 months	> 6 months		
Patient with co-morbid/s	55(79.7)	14(20.3)	5.340	0.021
On insulin treatment	19(59.4)	13 (40.6)	1.227	0.268
Poor glycaemic control	69(71.9)	27(28.1)	0.520	0.820

Table 3: Association between co-morbidity, insulin treatment, poor glycaemic control and duration of tuberculosis treatment

Table 3 showed there is a significant association between presence of co-morbidity and duration of tuberculosis treatment

RESULT: Tuberculosis treatment outcome

Variable	Treatment outcome n(%)		X ² value	p value
	Alive	Death		
Patient with co-morbid/s	64(92.8)	5(7.2)	2.890	0.089
On insulin treatment	30(93.8)	2(6.2)	1.088	0.297
Poor glycaemic control	84(87.5)	12(12.5)	1.638	0.194

Table 4: Association between co-morbidity, insulin treatment, glycaemic control and outcome of tuberculosis treatment

Table 4 showed there are no significant association between co-morbidity, insulin treatment, glycaemic control and outcome of tuberculosis treatment

DISCUSSION

DISCUSSION

- The mean age for the study was 56.8 years. This refers to middle age group.
- Our study showed male predominance in all age groups but there is no significant association between age and gender. This is quite different to the study done by Pérez-Guzmán *et al.* where there was a male predominance up to age 40 years old and receding to female predominance from age 50 years old onwards⁹.

DISCUSSION

- Mean duration of diabetes in our study was 5.43 years. The longer duration of diabetes will increased the likelihood to develop active tuberculosis.
- The status for diabetic control was poor where the mean HbA1c was 9.9%. This may contribute to the rising prevalence of tuberculosis in diabetics. The exact prevalence in Terengganu for year 2013 was 23.1%, year 2015 was 26.9%. With the also rising diabetes epidemic, as shown in NHMS 2015, it poses a threat to TB burden further.

DISCUSSION

- Nandakumar *et al.* showed there was no association between diabetic control during treatment and the course of response to anti-TB treatment¹². This is consistent with our study in which there is no significant association between glycaemic control and sputum conversion or duration of treatment or tuberculosis outcome.
- Though there is an association between diabetes with other co-morbidities and duration tuberculosis treatment, this study did not explore which co-morbid contribute most to the finding.

CONCLUSION

- Majority of our TB patients had uncontrolled diabetes. Most of them were PTB smear positive with mild chest radiograph changes.
- Diabetes with other co-morbidities has an influence on duration of tuberculosis treatment.
- Despite of uncontrolled diabetes, 87.9% of them had achieved treatment success status, keeping to the National Indicator (>85%).
- Screening of TB in diabetics should be thoroughly performed. Regular TB symptoms' checks and CXR can detect TB cases early.

RECOMMENDATION

- This study is not able to find any significant association between diabetes and tuberculosis outcome as proven by other studies. This is probably due to limitation of the study which is retrospective in nature with small sample size. Further prospective study is needed in order to give a significant and better result.

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