

Epidemical Study for Patients of Tuberculosis (TB) in Diyalagovernorate.

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Abstract: This study was conducted for the period from 1 / 5 / 2016 to 1 / 11 / 2016 in Diyala in Iraq. This study show the positivity of TB infection in baquba city and miqdadia city were highest rate in (2013) year (20.26%), (65.45%) and lowest rate of positivity were in (2016) year (20.40%), (40%) with high significant difference between years according to city ($P < 0.05$). In baladrose city, alkhallas city and almansorya city the positivity of TB infection were highest rate in (2015) year (41.93%), (35.20%) and (5.88%) and lowest rate of positivity was in (2014) year (23.37%), with no significant difference between years according to city ($P > 0.05$), (35.20%) and lowest rate of positivity alkhallas city was in (2013) year (0%) with high significant difference between years according to city ($P < 0.05$). In almansorya city no infection was in (2013, 2014, 2016) year (0%) with no significant difference between years according to city ($P > 0.05$). positivity of TB infection in baquba city, miqdadia city, baladrose city, alkhallas city and almansorya city were high in male (11.18%), (55.02%), (40.59%), (22.40%) and (5.26%) than female (9.28%), (26.30%), (26.30%), (20.89%) and (0%) with no significant difference between sex according to city ($P > 0.05$). in kanaqin city positivity of TB infection was high in female (33.33%) than male (14.28%) with no significant difference between sex according to city ($P > 0.05$). The highest positivity of TB infection in baquba city, miqdadia city were in age period (51-60) year (12.74%), (68.57%). In alkhallas city and kanaqin city highest positivity of TB infection was in age period (61-70) year (80%), (33.33%). In almansorya city highest positivity of TB infection was in age period (41-50) year (9.09%). in (2014), (2016) year highest positivity of TB infection were in age period (>80) year (33.33%), (25%). In (2015) year highest positivity of TB infection was in age period (71-80) year (50%), While the highest positivity of TB infection in (2013) was in age period (51-60, >80) year (50%). The positivity of TB infection in (2013), (2015) and (2016) was high in male (41.05%), (32.23%) and (16.37%) than female with no significant difference between sex according to years ($P > 0.05$).

Aim of The Study : Study the epidemiology of the disease (Tuberculosis), causing and effect factors in Diyala

Keywords: Mycobacterium tuberculosis, Epidemiology

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I. Introduction

Tuberculosis (TB) is a contagious and airborne disease. It is a chronic, progressive infection with a period of latency following initial infection. It is a disease of poverty affecting mostly young adults in their most productive years. The vast majority of TB deaths are in the developing world ⁽¹⁾. The main cause of TB is Mycobacterium tuberculosis, a small, aerobic, non-motile bacillus the high lipid content of this pathogen accounts for many of its unique clinical characteristics ^(2, 3). Mycobacterium tuberculosis (MTB) is a pathogenic bacterial species in the genus Mycobacterium and the causative agent of most cases of tuberculosis. This bacteria was first discovered in 1882 by Robert Koch, M. tuberculosis has an unusual, waxy coating on its cell surface (primarily mycolic acid), which makes the cells impervious to Gram staining. Acid-fast detection techniques are used instead. The physiology of M. tuberculosis is highly aerobic and requires high levels of oxygen ^(4, 5).

Its unusual cell wall, rich in lipids is likely responsible for this resistance and is a key virulence factor ^(6, 3). If a Gram stain is performed on MTB, it stains very weakly Gram-positive or not at all (cells referred to as "ghosts"). While mycobacteria do not seem to fit the Gram-positive category from an empirical standpoint (i.e., they do not retain the crystal violet stain), they are classified as acid-fast Gram-positive bacteria due to their lack of an outer cell membrane ⁽⁴⁾. Tuberculosis typically attacks the lungs, but can also affect other parts of the body. It is spread through the air when people who have an active TB infection cough, sneeze, or otherwise transmit their saliva through the air ^(3, 7).

Epidemiology of Tuberculosis: It is estimated that one third of the world's population (approximately 2 billion people) are infected with tubercle bacilli ⁽⁸⁾. The global tuberculosis caseload appears to be growing slowly. Nearly two million persons die from TB each year, ^(9,10). The distribution of tuberculosis is not uniformed across the world; about 80% of the population in many Asian and African countries test positive in tuberculin tests, while only 5–10% of the U.S.A population tests positive ⁽¹¹⁾.

According to the World Health Organization (WHO), TB infection is the second highest mortality causing infectious disease worldwide ⁽¹²⁾. Despite advances and developments in diagnosing and treating TB, TB remains a major health burden around the globe. An estimated 8.6 million new cases and 1.3 million deaths occurred in 2012 ⁽¹³⁾. Iraq is considered among eight high TB burden countries in Eastern Mediterranean Region (EMR) ⁽¹⁴⁾. The key aspect of TB control is rapid diagnosis, which for many years has been based on the staining of smears for the presence of acid-fast bacilli (AFB) ⁽¹⁵⁾. Iraq is located eight in (EMRO) rank according to incidence in 2011, and there were an estimated 15000 incident cases of the all new and relapse cases of TB in Iraq. On other hand, the incidence of TB in Basrah had been 58.1% from 136 cases in 2001 (Rodeen, 2001), 58.6% from 232 cases in 2004 ⁽¹⁶⁾, and 63.8% in 2007 ⁽¹⁷⁾.

II. Materials And Methods

Samples collection:

A retrospective study included statistical collection of tuberculosis patients of different age and sex's groups, were collected from patients and carriers in Center for Chest and Respiratory Diseases in Baquba / Diyala over period from 13/12/2016 to 1/3/2017. The X² (Chi-squared) test method used to test theories on the differences between the percentages, a level of significance of $\alpha=0.05$ was applied to test, the statistics software used to process the data analysis were the Microsoft Excel 2010.

Results And Discussion

Table (1) distribution of TB patients on Diyala cities and according to four years.

Years	Baqubeh			Baladrose			Almiqdaydiah			Alkhals			Khanaqin			Almansoriya		
	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%
2013	153	31	20.26	70	24	34.28	110	72	65.45	0	0	0	0	0	0	0	0	0
2014	203	14	6.89	59	14	23.27	79	40	50.63	64	11	17.18	29	7	24.13	14	0	0
2015	112	13	11.60	31	13	41.93	60	31	51.66	34	12	35.2	0	0	0	17	1	5.88
2016	125	3	2.40	70	24	34.28	30	12	40.00	27	4	14.81	0	0	0	9	0	0
Total	593	61	10.28	230	75	32.60	279	155	86.59	125	27	21.61	29	7	4.14	40	1	2.50
X ²	26.54			5.90			48.58			14.62			21.00			3.00		
P value	<0.001***			0.11 ^{NS}			<0.001***			0.002**			<0.001***			0.39 ^{NS}		

Table (1) show the positivity of TB infection in baquba city was highest rate in (2013) year (20.26%) and lowest rate of positivity was in (2016) year (2.40%) with high significant difference between years according to city ($P<0.05$). in baladrose city the positivity of TB infection was highest rate in (2015) year (41.93%) and lowest rate of positivity was in (2014) year (23.27%) with no significant difference between years according to city ($P>0.05$). in miqdadia city the positivity of TB infection was highest rate in (2013) year (65.45%) and lowest rate of positivity was in (2016) year (40%) with high significant difference between years according to city ($P<0.05$). in alkhals city the positivity of TB infection was highest rate in (2015) year (35.20%) and lowest rate of positivity was in (2013) year (0%) with high significant difference between years according to city ($P<0.05$). in kanaqin city positivity of TB infection was highest rate in (2014) year (24%) and no infection was in (2013,2015,2016) years (0%) with high significant difference between years according to city ($P<0.05$).in

almansorya city the positivity of TB infection was highest rate in (2015) year (5.88%) and no infection was in (2013,2014,2016) year (0%) with no significant difference between years according to city (P>0.05).

Table (2) distribution of tb patients on diyala cities and according to sex.

Sex	Baqubeh			Baladrose			Almiqdaydiah			Alkhals			Khanaqin			Almansoriya		
	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%
Male	313	35	11.18	101	41	40.59	130	76	58.46	58	13	22.41	14	2	14.28	19	1	5.26
Female	280	26	9.28	129	34	26.35	149	79	53.02	67	14	20.89	15	5	33.33	21	0	0
Total	593	61	10.28	230	75	32.60	279	155	86.59	125	27	21.61	29	7	4.14	40	1	2.50
X2	1.32			0.65			0.05			0.03			1.32			1.00		
P value	0.25 ^{NS}			0.41 ^{NS}			0.80 ^{NS}			0.84 ^{NS}			0.25 ^{NS}			0.35 ^{NS}		

Table (2) show the positivity of TB infection in baquba city was high in male (11.18%) than female (9.28%) with no significant difference between sex according to city (P>0.05). in baladrose city positivity of TB infection was high in male (40.59%) than female (26.30%) with high significant difference between sex according to city (P<0.05). in miqdadia city the positivity of TB infection was high in male (55.02%) than female (26.30%) with no significant difference between sex according to city (P>0.05). Also in alkhals city the positivity of TB infection was high was high in male (22.40%) than female (20.89%) with no significant difference between sex according to city (P>0.05). in other hand, in kanaqin city positivity of TB infection was high in female (33.33%) than male (14.28%) with no significant difference between sex according to city (P>0.05). in almansorya city positivity of TB infection was high in male (5.26%) than female (0%) with no significant difference between sex according to city (P>0.05).

Table (3) distribution of TB patients on Diyala cities and according to age periods.

Years	Baqubeh			Baladrose			Almiqdaydiah			Alkhals			Khanaqin			Almansoriya		
	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%
1-10	10	1	10.00	2	0	0	0	0	0	8	0	0	0	0	0	2	0	0
11-20	22	2	9.09	9	0	0	15	7	46.66	12	2	16.66	0	0	0	5	0	0
21-30	78	6	7.69	7	1	14.28	24	15	62.50	9	0	0	12	3	25.00	6	0	0
31-40	51	9	12.64	10	8	80.00	33	20	60.60	11	0	0	2	0	0	4	0	0
41-50	104	11	10.57	60	17	28.33	47	10	21.27	22	7	31.81	5	2	20.00	11	1	9.09
51-60	102	13	12.74	37	12	32.43	70	48	68.57	18	0	0	0	0	0	0	0	0
61-70	120	11	9.16	58	18	31.03	54	32	59.25	10	8	80.00	3	1	33.33	5	0	0
71-80	71	6	8.45	28	8	28.57	31	20	64.51	20	5	25.00	4	0	0	5	0	0
>80	30	2	6.66	19	11	57.89	5	3	60.00	15	5	33.33	3	1	33.33	2	0	0
Total	593	61	10.28	230	75	32.60	279	155	86.59	125	27	21.61	29	7	4.14	40	1	2.50
X2	23.54			57.05			106.05			28.66			12.28			8.00		
P value	<0.001 ^{***}			<0.001 ^{***}			<0.001 ^{***}			<0.001 ^{***}			0.13 ^{NS}			0.43 ^{NS}		

Table (3) show the highest positivity of TB infection in baquba city was in age period (51-60) year (12.74%) and lowest infection was in age period (>80) year (6.66%) with high significant difference between age period according to city (P<0.05). in baladrose city highest positivity of TB infection was in age period (31-40) year (80%) and lowest infection was in age periods (1-10,11-20) years (0%) with high significant difference between age period according to city (P<0.05). in miqdadia city highest positivity of TB infection was in age period (51-60) year (68.57%) and lowest infection was in age period (1-10) year (0%) with high significant difference between age period according to city (P<0.05). in alkhallas city highest positivity of TB infection was in age period (61-70) year (80%) and lowest infection was in age periods (1-10,21-30,51-60) years (0%) with high significant difference between age period according to city (P<0.05). in kanaqin city highest positivity of TB infection was in age period (61-70,>80) year (33.33%) and lowest infection was in age periods (1-10,11-20) years (0%) with no significant difference between age period according to city (P>0.05). in almansorya city highest positivity of TB infection was in age period (41-50) year (9.09%) and no infection in other age periods infection was in age periods (1-10,11-20) years (0%) with no significant difference between age period according to city (P>0.05).

Table (4) distribution of TB patients on four years and according to age periods

	2013			2014			2015			2016		
	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%
1-10	4	1	25.00	12	1	8.33	5	0	0	3	0	0
11-20	21	7	33.33	30	3	10.00	10	2	20.00	17	0	0
21-30	62	27	43.54	28	6	21.42	7	1	14.28	14	1	7.14
31-40	55	20	36.36	30	8	26.66	30	4	13.33	30	4	13.33
41-50	50	21	42.00	80	12	15.00	45	9	20.00	34	7	20.58
51-60	56	28	50.00	90	15	16.66	65	25	38.46	54	13	24.07
61-70	52	13	25.00	85	20	23.59	73	20	27.39	41	7	17.07
71-80	25	6	24.00	75	15	20.00	10	5	50.00	46	6	13.04
>80	8	4	50.00	18	6	33.33	9	4	44.44	20	5	25.00
Total	333	127	38.13	448	86	19.19	254	70	27.55	261	43	16.47
X2	59.02			33.30			80.17			29.20		
P value	<0.001***			<0.001***			<0.001***			0.002**		

Table (4) show the highest positivity of TB infection in (2013) was in age period (51-60,>80) year (50%) and lowest infection was in age period(71-80) year (24%) with high significant difference between age period according to years (P<0.05). in (2014) year highest positivity of TB infection was in age period (>80) year (33.33%) and lowest infection was in age period(1-10) year (8.33%) with high significant difference between age period according to years (P<0.05). In (2015) year highest positivity of TB infection was in age period (71-80) year (50%) and lowest infection was in age period(1-10) year (0%) with high significant difference between age period according to years (P<0.05).in (2016) year highest positivity of TB infection was in age period (>80) year (25%) and lowest infection was in age period(1-10,11-20) year (0%) with high significant difference between age period according to years (P<0.05).

Table (5) distribution of TB patients on four years and according to sex .

	2013			2014			2015			2016		
	NT	NP	%	NT	NP	%	NT	NP	%	NT	NP	%
Male	151	62	41.05	222	42	18.19	121	39	32.23	137	23	16.37
Female	182	65	35.71	226	44	19.46	133	31	23.30	124	20	16.21
Total	333	127	38.13	448	86	19.19	254	70	27.55	261	43	16.47
X2	0.07			0.04			0.91			0.45		
P value	0.79 ^{NS}			0.82 ^{NS}			0.33 ^{NS}			0.50 ^{NS}		

Table (5) show the positivity of TB infection in (2013) was high in male (41.05%) than female (35.7%) with no significant difference between sex according to years ($P>0.05$). in (2014) year positivity of TB infection was high in female (19.46%) than male (18.19%) with no significant difference between sex according to years ($P>0.05$). In (2015) year positivity of TB infection was high in male (32.23%) than female (23.3%) with no significant difference between sex according to years ($P>0.05$). in (2016) year positivity of TB infection was high in male (16.37%) than female (16.27%) with no significant difference between sex according to years ($P>0.05$).

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