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A RETROSPECTIVE OBSERVATIONAL STUDY OF THE CLINICAL FEATURES OF EXTRAPULMONARY TUBERCULOSIS IN THE DAMASCUS, SYRIA

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ABSTRACT

Background: Tuberculosis (TB) is a major public health concern worldwide and is the 13th leading cause of death, and the second deadliest infectious disease after COVID-19 worldwide. Extrapulmonary tuberculosis (EPTB) cases accounted for 15% of the 7.2 million cases of TB worldwide in 2019. Global statistics indicate that Tuberculosis causes 4,500 deaths every day.[1] We aim to study the epidemiology of EPTB and studying the various symptoms and Comorbidities for pulmonary and extrapulmonary tuberculosis and their risk factors. **Methods:** A multicenter retrospective study was conducted at the National Center for Tuberculosis Control in Damascus in the year 2020 to analyze the patients with extrapulmonary tuberculosis. All patients diagnosed with EPTB in 2020 in Damascus were included. 205 patients diagnosed with pulmonary TB in 2020 in Damascus were randomly included to study the association of pulmonary TB risk factors and EPTB. **Results:** 205 patients were diagnosed with extrapulmonary tuberculosis in Damascus and its countryside in the year 2020, and the most common site of infection was Lymph Nodes (102) 49.75%, while ear and breast were the least common (1 case of each). Cervical nodes were the most affected nodes with EPTB (80.40%), while mediastinal nodes were the least affected (1.96%). The highest incidence rate was in patients between 25 and 34 years old, while the lowest was in patients older than 65. The percentage of infected females was approximately 66%, while the percentage of infected males was approximately 34%. The majority of infected patients were residents of the city (78.68%) compared to infected patients from the countryside (21.31%). The most common comorbidity was Hypertension: 23.41% of Extrapulmonary TB cases and 33.2% of pulmonary cases, while kidney diseases were the least common in both. EPTB was associated with female gender and rural residence with a statistically significant relationship (P-value<0.05), while Pulmonary TB associated with male gender and smoking. The most common general symptom associated with extrapulmonary tuberculosis was fever 55.60%, while night sweats were the least common symptom 14.63%. **Conclusion:** Tuberculosis is a major public health concern worldwide that can cause death or cause long-lasting complications but can still be prevented by vaccination and avoiding the possible risk factors identified in this study.

KEYWORDS: Tuberculosis, Extrapulmonary Tuberculosis, TB, EPTB, Epidemiology, Damascus, Syria, Multicenter, Retrospective.

Abbreviations: TB: Tuberculosis, EPTB: Extrapulmonary Tuberculosis.

INTRODUCTION

Tuberculosis is a major public health concern worldwide.[1] Globally, tuberculosis is the 13th leading cause of death and the second deadliest infectious disease after COVID-19.[2] In 2020, there were 9.87 million new cases of TB globally, including which men constituted 56% of these cases, women 33%, and children 11%.[2]

Although tuberculosis most commonly affects the lungs, it can also affect other sites, which is known as extrapulmonary tuberculosis (EPTB).[2,3] EPTB constituted 14% of TB cases in 2017.[4]

The most common anatomical sites affected by extrapulmonary TB are lymph nodes, pleura, bone and joints, urogenital tract, and meninges.[5] EPTB can virtually affect any organ, producing a wide spectrum of clinical manifestations that pose challenges for diagnosing and managing the disease effectively.[6]

When considering the diagnostic difficulties of EPTB the real magnitude of the problem at the community level may be underestimated especially with the current management system and the limited possibilities for diagnosis and treatment. According to the statistics of the national center for tuberculosis control in Damascus, The incidence of tuberculosis in Damascus increased to 1004 cases of PTB and EPTB in 2013 after it was 378 cases in 2010, then it returned to decline again in 2020 by about 306 cases, one of the main factors that caused this increase is the lack of health care services resulting from the war in Syria and which also caused rise in tuberculosis rates and the re-emergence of diseases it had been dormant as long before the war, as Polio. To draw attention towards this problem, we made this study with the aim of understanding the prevalence of EPTB in Damascus and its countryside in 2020, diversity in its clinical presentations, In addition to studying differences in comorbidities and risk factors for both pulmonary and extrapulmonary tuberculosis.

METHODS

Subjects: The sample of the study included patients with extrapulmonary tuberculosis who met the inclusion criteria (the main group for our study), and patients diagnosed with pulmonary Tb (comparison group).

Inclusion and Exclusion criteria: All patients with confirmed extrapulmonary tuberculosis, and 205 randomly chosen confirmed cases of pulmonary TB were included in this study. All patients included were diagnosed in 2020 in Damascus and its countryside. Suspected and probable cases that have not been confirmed with TB, cases with insufficient data, and patients who did not return to the center after diagnosis were excluded. No cases of miliary tuberculosis and combined tuberculosis (pulmonary and extrapulmonary TB together at the same time) were recorded for the year 2020.

The importance of the research

1. An epidemiological study of Extrapulmonary Tuberculosis and its prevalence during the year 2020 in Damascus and its countryside.
2. Studying the various symptoms of each type of extrapulmonary tuberculosis.
3. The risk factors differences between pulmonary and extrapulmonary tuberculosis
4. Comorbidities with Extrapulmonary Tuberculosis patients and studying the statistical differences with Pulmonary TB patients.

Instrumentation and Procedure: The study was conducted in a retrospective case-control design. The authors collected clinical data from the patient's medical records that were kept in the National Center for Tuberculosis Control in Damascus. This center contains data on all TB cases admitted to all hospitals and TB centers in Damascus and its countryside. The medical files of all the patients in our study sample were thoroughly studied. Included patients were contacted by the authors to obtain further or missing information. Then specifically designed forms were filled up with the gathered data which included the patient's gender, age, area of living (rural or urban), place of living (healthy or unhealthy), occupation, symptoms, clinical manifestations, comorbidities, and habits (smoking and alcohol consumption).

To study the association between the risk factors and comorbidities of pulmonary TB and Extrapulmonary TB, we added 205 pulmonary TB cases, which is the same number of individuals in the main group. The individuals in the control group were added randomly from the same center and year.

Diagnostic methods

Methods of confirming the diagnosis of EPTB in the studies sample were:

1- Biopsy: used this method in lymph nodes TB, peritoneum TB, Pott's disease, gastrointestinal TB, breast TB, Ear TB, and skeletal TB.[7]
We find granulomatous tissue by microscopic examination of the biopsy.

2- Paracentesis: Used in pleura TB, peritoneum TB, pericardial TB and CSF in meninges TB.[8]
The findings in Lumbar puncture are lymphocytic-predominant, elevated protein levels and low glucose.[9]

3- MRI / CT: in Pott's disease and pericardial TB.[10]
Pott's disease MRI/CT findings are vertebral destruction with a thickening of the paravertebral soft tissues and the displacement of bone fragments into the medullary canal.[11]

4- Echocardiography: pericardial TB the findings are large pericardial effusion, Thickened pericardium and cardiac tamponade.[12]

5- Screening for Koch's bacillus in urine in case of urinary tuberculosis.[13]
remains the gold standard for diagnosing TB In suspected Urinary TB, three early morning urine samples on consecutive days are taken for smear microscopy and culture.[14]

6- Clinical diagnosis: in the case of Eye tuberculosis.[15]

Oculotic tuberculosis gives symptoms depending on the location of the eye injury, if the infection is Orbit. Patients may present with proptosis, eyelid swelling, intermittent periorbital swelling, headache, epistaxis, decreased vision, visual field abnormalities, chemosis, Marcus Gunn pupil, epiphora and increased orbital resistance to retropulsion.[16]

A simple chest x-ray is performed for all patients with extrapulmonary tuberculosis to screen for co-infection with pulmonary tuberculosis.

A direct sputum examination is performed if the chest X-ray is positive to confirm the pulmonary infection. In the

case of a negative image, no further examination is required.

Data analysis: This multicenter retrospective study was undertaken in the National Centre for Tuberculosis control in Damascus and its countryside in 2020. Statistical analyses were performed using Statistical Package for Social Sciences version 25.0 (SPSS Inc., Chicago, IL, United States). Descriptive statistics were used to describe the demographics of the studied sample. Pearson Chi-Square was performed to evaluate the relationship between tuberculosis and age groups, in addition to the relationship between gender and the types of EPTB.

The X2 test and Fisher's exact test were used as appropriate to compare the two groups, extrapulmonary tuberculosis patients with comorbidities and Pulmonary Tuberculosis patients with comorbidities (Hypertension, Diabetes Mellitus, COPD, Kidney Disease and Covid-19). The X2 test and Fisher's exact test were also used to compare the risk factors for patients with pulmonary and extrapulmonary tuberculosis (Sex, Residence, Smoking, Unhealthy housing, Forced displacement and Imprisonment).

P-value < 0.05 was considered statistically significant.

Ethical considerations: Ethical approval was obtained from the Institutional Review Board (IRB) Faculty of Medicine, Syrian Private University, and the National Center for Tuberculosis Control in Damascus Institutional Review Board (IRB). Verbal consent was obtained from each patient when contacting them for data collection purposes. Please note that the ethical approval of this study was granted without an ethical committee reference number.

RESULTS

205 patients were diagnosed with extrapulmonary tuberculosis in Damascus and its countryside in the year 2020, males represented 70 (34.14%) while females represented 135 (65.86%) of the patients. 48 (22.4%) were between 25 and 34 years, this age group represented the majority of the sample, and the lowest age group 9 (4.4%) was 65 years and more. **(Table 1)**

The majority of EPTB patients were residents in the city 141 (68.8%) compared to EPTB patients from the countryside 64 (31.2%). The sites of EPTB were distributed as follows: Lymph nodes 102 (49.8%), Peritoneum 28 (13.7%), Pleura 26 (12.7%), Spine 11 (5.4%), Meninges 8 (3.9%), Bones 7 (3.4%), Skin and Soft tissues 5 (2.4%), Genitourinary system 5 (2.4%), Pericardium 3 (1.5%), Eye 3 (1.5%), Ear 1 (0.5%), Breast 1 (0.5%). In females, the most common EPTB type was Lymph node TB 77 (57.0%) (P-value < 0.05), followed by gastrointestinal TB 5 (3.7%) and Peritoneal TB 22 (16.3%), while the remaining studied EPTB types were more common in males and were distributed as follows: Pleural TB 15 (21.4%) (P-value < 0.05), and Pericardial TB 3 (4.3%). **(Table 1)**

In diagnosing tuberculosis of the lymph nodes by biopsy, the affected nodes were distributed as follows: Cervical nodes: 82/102 cases (80.40%), Axillary nodes: 7/102 cases (6.86%), Supraclavicular nodes: 5/102 cases (4.90%), Submandibular nodes: 3/102 cases (2.94%), Mesenteric nodes: 3/102 cases (2.94%), Mediastinal nodes: 2/102 cases (1.96%).

The most common general symptom associated with extrapulmonary tuberculosis was fever 114 (55.60%), while night sweats were the least common symptom 30 (14.63%). the most common symptoms in some types of extrapulmonary TB were Site Swelling 92/102 (90.1%) in Lymph Node TB, Coughing 21/26 (80.7%) in Pleural TB, Abdominal Pain 23/28 (82.14%) and Nausea 23/28 (82.14%) in Peritoneal TB. **(Table 2)**

We found a statistically significant relationship (P-value < 0.05) with hypertension 68 (33.2%) and COPD 14 (6.8%), where they were more common in pulmonary TB. While the Diabetes Mellitus 31 (15.1%) was more common in Extrapulmonary TB.20 (9.8%) extrapulmonary TB Patients infected with Covid-19, 17 (8.3%) of them had lymph node tuberculosis, 2 (1%) had urogenital tuberculosis, and 1 (0.5%) case with pleural tuberculosis. **(Table 3)**

Regarding the possible risk factors, Females constituted more than two-thirds of the case group 135 (65.9%), (P-value < 0.05), also EPTB was more prevalent in the rural areas 64 (31.2%) than pulmonary TB 32 (15.6%) (P-value < 0.05). Male sex 124 (60.5), city residency 173 (84.4), smoking 114 (55.6), and imprisonment 35 (17.1%) were more associated with pulmonary TB with a statistically significant relationship (P-value < 0.05). **(Table 3)**

In non-adherence to tuberculosis treatment: 9 cases were recorded (4.39%) and were distributed as follows: 4/102 (6.86%) of the patients with Lymphocytic TB, 1/26 (3.84%) of the patients with Pleural TB, 1/11 (9.09%) of patients with Pott's disease, 1/5 (20%) of patients with skin and soft tissue TB, 1/3 (33.33%) of patients with Pericardial TB, 1/1 (100%) of patients with Breast Tb.

In Relapse Cases: 12/205 (5.85%) cases were recorded and were distributed as follows: 7/102 (6.86%) of Lymphocytic TB cases, 2/28 (7.14%) of Peritoneal TB, 2/11 (18.18%) of Spine TB cases in the study, 1/8 (12.50%) of Meningeal TB cases. Moreover, according to the National Center for Tuberculosis Control, there were no cases of combined tuberculosis cases (pulmonary and extrapulmonary) confirmed in 2020.

Table 1: The relationship between "age groups, extrapulmonary tuberculosis types" and gender.

		All Extrapulmonary TB patients n=205 (%)	Male n=70 (%)	Female n=135 (%)	p-value
Ages group	0-4 years	13 (6.3)	7 (10.0)	6 (4.4)	0.647
	5-14 years	27 (13.2)	11 (15.7)	16 (11.9)	
	15-24 years	37 (18.0)	9 (12.9)	28 (20.7)	
	25-34 years	46 (22.4)	16 (22.9)	30 (22.2)	
	35-44 years	28 (13.7)	10 (14.3)	18 (13.3)	
	45-54 years	32 (15.6)	21 (15.6)	11 (15.7)	
	55-64 years	13 (6.3)	3 (4.3)	10 (7.4)	
	65 years or more	9 (4.4)	3 (4.3)	6 (4.4)	
TB type	Lymph Nodes TB	102 (49.8)	25 (35.7)	77 (57.0)	< 0.05
	Peritoneal TB	28 (13.7)	6 (8.6)	22 (16.3)	0.127
	Pleural TB	26 (12.7)	15 (21.4)	11 (8.1)	< 0.05
	Pott's disease (spinal TB)	11 (5.4)	5 (7.1)	6 (4.4)	0.416
	Meningeal TB	8 (3.9)	5 (7.1)	3 (2.2)	0.084
	Skeletal TB	7 (3.4)	5 (7.1)	2 (1.5)	< 0.05
	Gastrointestinal TB	5 (2.4)	0 (0.0)	5 (3.7)	0.103
	Skin and Soft tissue TB	5 (2.4)	2 (2.9)	3 (2.2)	0.780
	Genitourinary TB	5 (2.4)	2 (2.9)	3 (2.2)	0.780
	Pericardial TB	3 (1.5)	3 (4.3)	0 (0.0)	< 0.05
	Eye TB	3 (1.5)	1 (1.4)	2 (1.5)	0.976
	ENT TB	1 (0.5)	1 (1.4)	0 (0.0)	0.164
	Breast TB	1 (0.5)	0 (0.0)	1 (0.7)	0.470

Table 2: Represents the types of extrapulmonary tuberculosis with its associated general symptoms.

TB Type	Symptoms associated General					
Lymph Node TB	Fever	Site Swelling	Single Lymphadenopathy	Multiple Lymphadenopathy	Tenderness	
	(47/102) %46.07	(92/102) %90.19	(90/102) 88.23%	(12/102) %11.76	(35/102) 34.31%	
Pleural TB	Fever	Coughing	Chest Pain	Dyspnea		
	(17/26) 65.38%	(21/26) 80.76%	(19/26) 73.07	(12/26) 46.15%		
Peritoneal TB	Fever	Abdominal Pain	Ascites	Nausea and Vomiting	Diarrhea	Jaundice
	(23/28) 82.14%	(23/28) 82.14%	(28/28) %100	(23/28) 82.14%	(6/28) 21.42%	(11/28) 39.28%
Meningeal TB	Fever	Headache	Nausea and Vomiting	Mental Confusion	Neck Stiffness	
	(5/8)	(5/8)	(3/8)	(3/8)	(5/8)	
	%62.50	%62.50	%37.50	%37.50	%62.50	
Pott's disease	Fever	Back Pain	Morphological Abnormalities	Abscesses	Nerve injury (hemiplegia)	
	(6/11)	(10/11)	(4/11)	(7/11)	(2/11)	
	%54.54	%90.90	%36.36	%63.63	%18.18	
Skeletal TB	Localized warmth	Skeletal Pain	Swellings	Movement Limitations		
	(4/7)	(6/7)	(5/7)	(7/7)		
	%57.15	%85.72	%71.50	%100		
Skin and Soft tissue TB	Fever	Painful Erythematous Areas	Hard Painless Ulcer			
	(3/5)	(1/5)	(4/5)			

	%60	%20	%80			
Genitourinary TB	Fever	Lower Abdominal Pain	Urinary Symptoms	Menstrual Changes	Sterility	
	(1/5)	(2/5)	(1/5)	(2/5)	(3/5)	
	%20	%40	%20	%40	%60	
gastrointestinal TB	Fever	Abdominal Pain	Bowel Habits Changes	Weight Loss	Right Iliac Fossa Mass	Nausea and Vomiting
	(2/5)	(4/5)	(1/5)	(3/5)	(1/5)	(2/5)
	%40	%80	%20	%60	%20	%40
Pericardial TB	Fever	Coughing	Chest Pain	Dyspnea		
	(3/3)	(2/3)	(2/3)	(3/3)		
	%100	%66.66	%66.66	%100		
Eye Tb	Eye Redness	Gradual Vision Loss				
	(3/3)	(3/3)				
	%100	%100				

Table 3: The relationship between extrapulmonary Tuberculosis Patients and "Comorbidities, possible risk factors".

		OR	Extrapulmonary TB patients n=205 (%)	Pulmonary TB patients n=205 (%)	p-value
Hypertension		116 (28.3)	48 (23.4)	68 (33.2)	< 0.05
Diabetes Mellitus		44 (10.7)	31 (15.1)	13 (6.3)	< 0.05
COPD		19 (4.6)	5 (2.4)	14 (6.8)	< 0.05
Kidney Disease		7 (1.7)	3 (1.5)	4 (2.0)	0.703
Covid-19		37 (9.0)	20 (9.8)	17 (8.3)	0.605
Risk factors					
Sex	Male	194 (47.3)	70 (34.1)	124 (60.5)	< 0.05
	Female	216 (52.7)	135 (65.9)	81 (39.5)	< 0.05
Residence	City	314 (76.6)	141 (68.8)	173 (84.4)	< 0.05
	Countryside	96 (23.4)	64 (31.2)	32 (15.6)	< 0.05
Smoking		193 (47.1)	79 (38.5)	114 (55.6)	< 0.05
Unhealthy housing		99 (24.1)	48 (23.4)	51 (24.9)	0.729
Forced displacement		100 (24.3)	43 (21.0)	57 (27.8)	0.107
Imprisonment		41 (10.0)	6 (2.9)	35 (17.1)	< 0.05

Table 4: Multivariable logistic regression analysis on risk factors associated with Pulmonary and Extrapulmonary TB patients.

	OR	95% CI for OR		p-value
		Lower	Upper	
Hypertension	.556	0.3988	0.9514	.083
Diabetes Mellitus	10.954	1.3339	5.1905	< 0.05
COPD	.023	0.1265	1.0336	< 0.05
Kidney Disease	1.357	0.1649	3.3771	0.727
Covid-19	2.297	0.6071	2.3544	0.088
Sex	2.809	1.9747	4.4140	< 0.05
Village	3.896	1.5198	3.9621	< 0.05
Smoking	.500	0.3376	0.7420	.885
unhealthy housing	.923	0.5872	1.4515	.123
Forced displacement	.518	0.4376	1.0855	.113

DISCUSSION

The data shows that lymph node TB is the dominant type of extrapulmonary tuberculosis in Damascus city and its countryside. Several studies in different countries have shown that the dominant type of extrapulmonary tuberculosis differs with various geographical locations. For example, lymph node TB was the most common type in the Netherlands (39%), the United States (40%), and

the United Kingdom (37%),[3,17,18] while pleural tuberculosis was the most common in Poland (36%) and Romania (58%).[19] There could be a possible reason for the difference in the most common sites of EPTB between Syria and other countries, which is that the BCG vaccine that is used in Syria, provides immunity to various types of TB, and thus may cause the absence or decrease in the appearance of them, while in countries where this vaccine is not given, the prevalence of the types of the TB that the BCG vaccine effects may be higher.[20,21]

The highest infection rate among the patients in the sample was in the age range of 25 to 34 years (22.43%), this age range was also the most age range associated with extrapulmonary TB in a similar Indian study.[22] Although extrapulmonary tuberculosis primarily affects adults, 19.51% of cases occurred in children under the age of 15 years, and this may be caused by the lack of vaccination due to the war in Syria and due to displacement cases, which amounted to 20.97%.

Most of the patients infected with extrapulmonary TB were females (65.85%), this was also the case in an Iranian study, which may indicate that there's a relationship between the female gender and extrapulmonary TB.[23]

As mentioned previously, the percentage of patients infected with extrapulmonary tuberculosis was higher in the city of Damascus compared to its countryside, at a rate of 68.8%, This may have been contributed to the far distance between the city center where most of the hospitals and TB centers are located and the countryside, and thus decreasing the number of patients coming from the countryside, and the movement of most of the rural population to the city, especially during the war years, At the same time, the number of rural residents with extrapulmonary tuberculosis was higher than those with pulmonary tuberculosis in the countryside, which indicates that rural residency is a risk factor for EPTB since there was a statistically significant relationship (P-value <0.05).[24]

In this study, hypertension was the most common comorbidity of TB with a rate of 23.4%, as well as in a Taiwanese and an Indian study.[25,26] We found a statistical significance when studying the relationship between hypertension and pulmonary TB (P-value <0.05).There was also a statistically significant relationship between diabetes mellitus and EPTB, which was also the case in a Malaysian study.[24,27] While COPD was associated with pulmonary TB with a statistically significant relationship.[28]

Although smoking is considered common in Syria, only 73 cases were recorded of smoking between active and passive smoking. Perhaps this is due to the small sample size, or the absence of an actual connection between smoking as a risk factor and between the infection with extrapulmonary tuberculosis which was the case in a Taiwanese study.[25] We also found a statistically significant relationship between smoking and pulmonary Tb, which is constant with other studies. Imprisonment was associated with pulmonary TB with a statistically significant relationship which is consistent with an American study.[29,30]

The most common presentation in lymph nodes TB was site swelling near the infected nodes (90.19%), while in a study conducted in India, the most common presentation was painless single node enlargement with fever. The most common symptom of pleural tuberculosis was dry nonproductive cough (80.76 %), followed by pleural pain (73.07%). These results are similar to what was mentioned in a Turkish study by Cohen and Richard.[31] Regarding Pott's disease "spinal tuberculosis", our findings were similar to those of an Indian study, where the most common symptoms were spinal pain and back pain.[32] In urogenital tuberculosis, our findings were also similar to those in an Indian study.[33] In Peritoneal tuberculosis, the most common symptom was ascites 28/28 (100%), followed by fever, abdominal pain, and vomiting, 23/28 (82.14%) for each. In meningeal tuberculosis, the most common symptoms were fever, headache, stiff neck, and confusion. These findings are similar to a study conducted in Turkey.[34] Tuberculosis of the skin and soft tissues had various symptoms such as hard, painless ulcers 4/5 (80%), fever 3/5 (60%), and painful erythematous area 1/5 (20%). In Skeletal tuberculosis, limitation of joint movement was the most common presentation with a percentage of 7/7 (100%), similar to a study conducted in northern Iran.[23] In gastrointestinal tuberculosis, the common symptoms were abdominal pain 4/5 (80%), weight loss 3/5 (60%), and nausea and vomiting 2/5 (40%). Abdominal pain was also the most common (74%) in a study conducted in the United Kingdom, while nausea and vomiting accounted for (31%) of the symptoms and were the second most common symptom.[35] In Pericardial tuberculosis, the most common symptoms were fever and dyspnea (100%), followed by coughing and chest pain (66%). In Ocular tuberculosis, eye redness and gradual vision loss were the most common (100%). As for ear tuberculosis, we had one patient who suffered from gonorrhea and progressive hearing loss. Regarding breast tuberculosis, there was one affected woman who had a painful lump in the right breast.

In the cases of recurrence, the rate of recurrence in Pott's disease was the highest (18.18%) compared to the rates of recurrence in other extrapulmonary TB types.

According to the records of the National Center for Tuberculosis Control in Damascus over 18 years (2003-2020), it was found that the rate of extrapulmonary tuberculosis was almost stable between 2003 and 2010, but in 2011 and 2015 there was a significant increase in the infection rates before they returned to their usual rates between the years 2016 and 2020, this increase may

be strongly attributed to the war that took place in Syria, where not all children were able to obtain the national vaccination program, which led to an increase in the incidence of many diseases, including tuberculosis, in addition to the re-emergence of other diseases such as polio for example.

CONCLUSION

Syria faces great challenges with regard to tuberculosis and extrapulmonary tuberculosis, due to the lack of awareness among people with this disease, Which leads to stopping treatment.

In addition to the lack of studies and research at the level of Syria and the rest of the regions, Which constitutes an obstacle to the development of ways to eliminate it and the development of methods of treating the very diverse symptoms.

Therefore, we recommend taking risk factors seriously, such as screening for diabetics and providing healthy and appropriate housing for the displaced. It is also necessary to spread awareness about the dangers of smoking and its association with tuberculosis, in addition to continuing vaccination campaigns against tuberculosis in children according to the national vaccination program.

In conclusion, studies and research on extrapulmonary tuberculosis in Syria and all countries must be intensified.

Study limitations

1. The sample size may be small due to the effects of Covid-19 in 2020 and the difficulties that accompanied the collection of this data or communication with its owners during the quarantine period.
2. There is no previous research in this field inside Syria or real statistics that reflect the numbers of actual cases in the city of Damascus and its countryside.
3. Some patients dropped out of treatment and did not return to the center and we were unable to communicate with them.

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Declarations

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Availability of Data and Materials

All data related to this paper's conclusion are available and stored by the authors. All data are available from the corresponding author at a reasonable request.

Conflict of interest

The authors declare that they have no conflict of interest.

Authors' contributions

AJ, MF, MN, SA, and FK conceptualized the study, wrote the study protocol, performed the statistical analysis, participated in data collection, and did the literature search. YM did a literature search and revision of the draft. All authors read and approved the final draft.

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