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Original Research Article

Changing trends in incidence and clinical spectrum of extra-pulmonary tuberculosis: a 10-year retrospective study in a rural teaching hospital in South India

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ABSTRACT

Background: EPTB, remains a great mimicker in spite of availability of new diagnostic tools. The data available in different literatures and national record remain inconclusive. This study aims to find the change in incidence and clinical spectrum of EPTB during 10 years in the proposed study center.
Methods: Retrospective, medical records based study, on patients newly diagnosed to have EPTB, at MOSC-MCH, Kolenchery, Kerala, India from 1-01-2006 to 31-12-2015.
Results: Among the 1488 new cases of tuberculosis 665 (44.7%) had EPTB and 823 (55.3%) had pulmonary TB (PTB). There was a consistent rise in annual number of new cases of EPTB from 2007 to 2013. Lymph-node, 31% (n=203) and pleural effusion 26% (n= 126) are common sites. There was female gender predominance in the age group of 18-44 years. Commonest site of lesion in females as well as in males was lymph node TB (n=121, 35.9% and n=82, 25% respectively). Pleural effusion and genital TB showed a male predominance.
Conclusions: Incidence of EPTB shows an increasing trend from 2006 to 2015 in this study which is in contrast to the falling state and national trends. In the global TB reports, India has underestimated TB data between 2000 and 2015. The rising trend of new cases in our study centre can be the impact of immigrant labourers or may be due to increased referred cases to this tertiary centre. Further multicentre studies and studies among the immigrant labourers should be done to evaluate this.

Keywords: Clinical spectrum, Extra pulmonary tuberculosis, The sites of occurrence of EPTB

INTRODUCTION

Tuberculosis is a double edged sword which causes socioeconomic burden apart from disease burden. It affects the economically and intellectually productive age groups mainly the males of the society.[1] Recent reports of RNTCP demonstrate 25-34 years as mostly affected age group.[2]

About 1/3 of current global population is infected asymptomatically with tuberculosis of whom 5-10 percent develop clinically significant lesions in their life time.[3,1] During the year 2013, 5.7 million new cases were reported to WHO.[3] TB cases in India accounts for one fourth of the total global cases with an incidence of 171 per 1,00,000 population in India during the year 2013.[2]

Though pulmonary tuberculosis is the most common presentation, extra pulmonary tuberculosis is not less significant. But there are only limited latest updates on EPTB available in the literature. When compared to pulmonary tuberculosis most of the EPTB have a very

indolent course and a bad prognosis.[4] In most cases EPTB lesions are diagnosed very late.[5] Recent studies conducted in US reports EPTB to be 21% of all TB cases.[6] Many studies have documented that lymph node TB or "The Kings evil" is the most common site of EPTB.[7] A combination of numerous unfavourable factors such as co-morbidities, poverty, overcrowding, malnutrition, movement of population and Tran-global migration contribute to the existence and resurgence of the disease in developed and developing countries.[8] EPTB is a great mimic and masquerade as many other clinical problems.[9,10] Failure of early diagnosis will lead to increased infectivity, mortality and multi drug resistance in the community. Under these circumstances, a detailed study on EPTB will help to create clinical suspicion among clinicians about the disease which will bring down the infectivity and mortality caused by the disease in the community.

METHODS

This was a retrospective cross-sectional study from medical records. Medical records were accessed to collect the details of patients with EPTB during the period of 1-01-2006 to 31-12-2015.

Medical records dated from 1-01-2006 to 31-12-2015 used were

- Pathology report- FNAC and Biopsy reports
- Microbiology reports- Microscopy, PCR and culture results
- RNTCP records of this hospital
- ICD coding system from central computer of the hospital.
- Case files of patients.

Study population

This study was conducted at MOSC Medical College, Kolenchery, Kerala, India. Among all IP/OP patients who had consulted this study center during 2006 to 2015, all who were newly diagnosed to have EPTB were considered as the study population.

Inclusion criteria

All patients who were newly diagnosed to have any EPTB lesion, satisfying the diagnosis criteria laid by RNTCP India, in this institution during the period of 2006 to 2015 were serially included.

Study definitions

Extra pulmonary tuberculosis

Tuberculosis of organs other than lungs such as pleura, lymph nodes, intestine, genitourinary tract, joints, ones, meninges etc. is called extra-pulmonary tuberculosis. Pleural tuberculosis is also classified as extra-pulmonary tuberculosis.[11]

Diagnosis of EPTB

As per the latest update from "Training course for Program managers of RNTCP", demonstration of AFB in a smear from extra pulmonary site is often difficult because of low bacillary load. The clinical features pertaining to the systems affected should be considered in the diagnosis of EPTB. However, the following some of the investigations which are helpful in the diagnosis of extra pulmonary tuberculosis.[11]

- FNAC and direct smear,
- Excision/ Biopsy of specimen for histo-pathological examination,
- Fluid for cytology, biochemical examination and smear examination,
- Radiologic findings - X ray, USG, CT, MRI,
- Mycobacterium TB culture,
- Polymerase chain reaction (PCR).

Clinical spectrum: They have mainly considered the site of lesion of EPTB.

Demographic data: The age and sex distribution of EPTB.

Incidence: It is defined as number of NEW CASES occurring in a defined population during a specified period of time. In this study the number of NEW CASES OF EPTB reported in this specified study center in each year from 2006 to 2015 was considered.

Sampling

All patients diagnosed to have EPTB during the year 2006-2015 satisfying the inclusion criteria was included into the study.

Sample size

Sample size was not required because this was a study involving the collection of all cases of newly diagnosed EPTB during the retrospective study period of 10 years.

Data analysis

All data were entered into Microsoft excel and was analyzed using SPSS software. They were represented as charts, tables and graphs to reach to interpretations.

RESULTS

Age wise distribution of EPTB

Among the 1488 new cases of tuberculosis of all forms, 665 (44.7%) had EPTB and 823 (55.3%) had pulmonary

TB (PTB). All EPTB patients were divided into 5 age groups as 1-17 years, 18-24 years, 24-44 years, 44-64 years and 65-100 years. More than three fourth cases (81.2%) cases were found in age group of 24 years and above (Figure 1).

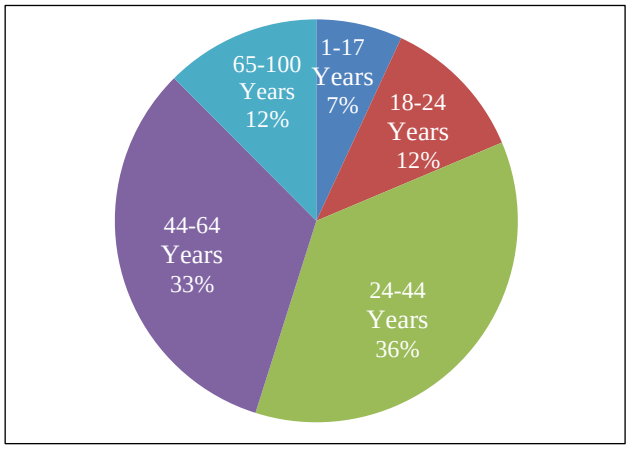

Figure 1: Age wise distribution of EPTB.

Association of gender and age group of EPTB patient

In the age group of 18-24 and 24-44 years there was a females gender predominance in patients presented with EPPTB in our centre. While in all other age groups EPTB was common in males. There is significant association between age group and gender for EPTB patients (Table 1) (P value <0.001).

Table 1: Association between gender and age group of EPTB patient.

Age group	Males	Females	Total
1-17 Years	26	20	46
18-24 Years	31	47	78
24-44 years	93	148	241
44-64 Years	138	79	217
65-100 Years	49	34	83
Grand Total	337	328	665
Chi Square test- P value= 0.00001			

Annual trend of EPTB

EPTB count increased from 40 in 2006 to a peak of 93 in 2013 and then declined to 77 in 2015. There is a consistent rising annual trend in number of new cases of EPTB from 2007 to 2013. The percentage of EPTB over total TB changes from 44% in 2006 to 49.2 %in 2013 and then falls marginally to 48.5 and 43.2 in 2014 and 2015 respectively (Figure 2).

Distribution of tuberculosis

Among the 1488 newly diagnosed cases of tuberculosis of all forms, 665(44.7%) had EPTB and 823 (55.3%) had Pulmonary TB(PTB) (Figure 3).

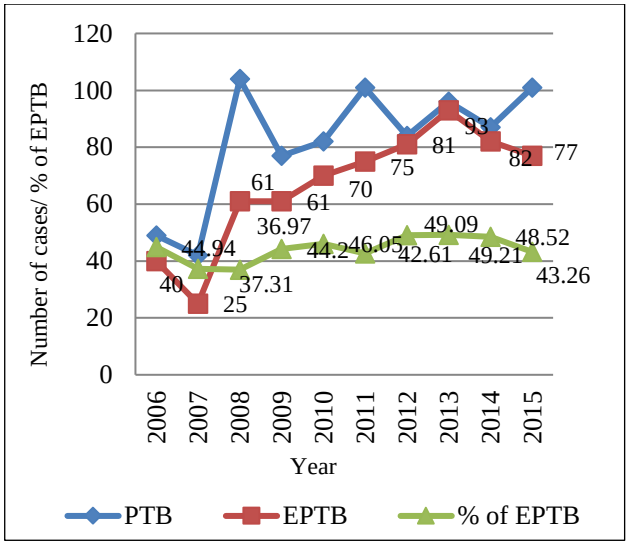

Figure 2: Annual trend of EPTB.

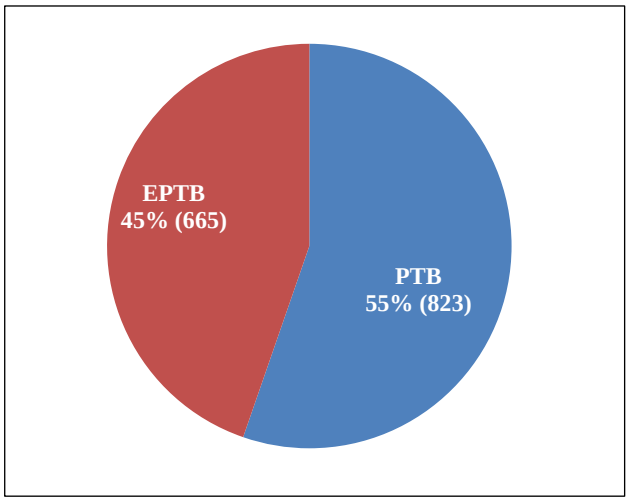

Figure 3: Distribution of tuberculosis.

Anatomical distribution of EPTB

Among the 665 EPTB cases lymph node TB 31% (n=203) constituted the commonest type. Other sites include pleural effusion 26% (n= 126), abdominal TB 11% (n=74), brain and spinal cord9% (n=59), bone and joint TB 6% (n=42), genitourinary TB 5%(n=32) and other rare sites 12% (n=79) (Figure 4).

Distribution of rare site of involvement of EPTB

EPTB cases treated as others/rare include bone marrow TB (n=1, 0.1%), breast TB (n=9, 1.3%), fistula in ano (n=1, 0.1%), millary TB (n=18, 2.7%), pericardial effusion (n=4, 0.6%), cutaneous TB (n=5, 0.7%), vocal cord TB (n=4, 0.6%), discharging sinuses (n=1, 0.1%), renal TB (n=1, 0.1%), parotid (n=2, 0.3%), ocular TB (n=1, 0.1%), cyst (n=5, 0.7%) and sites not mentioned (n=27, 4%) (Table 2).

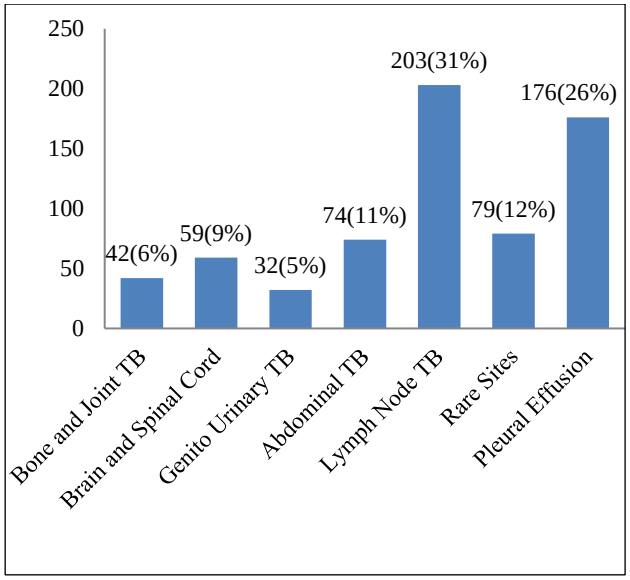

Figure 4: Anatomical distribution of EPTB.

Table 2: Distribution of rare site of involvement of EPTB.

Rare Sites	No. of cases	% of total cases
Bone marrow TB	1	0.1
Breast TB	9	1.3
Cyst	5	0.7
Fistula in ano	1	0.1
Miliary TB	18	2.7
Ocular TB	1	0.1
Parotid	2	0.3
Pericardial effusion	4	0.6
Renal TB	1	0.1
Discharging sinus	1	0.1
Skin TB	5	0.7
Rare and other unspecified organs	27	4
Vocal cord	4	0.6
Grand total	79	11.8

Distribution of anatomical site of EPTB according to age

Around 45% of lymph node cases were seen in age group 22-44 years, while more than 50% of pleural effusions were seen in age above 44 years. Genitourinary tract lesions were common in 44-64 age (49%).

In children lymph node TB was the most common site of lesion (32.6%) while in old age (above 65 years) pleural effusion (37.3%) was the commonest EPTB lesion. in all other age groups lymph node was the commonest site of lesion. Chi-Square test for statistically significance showed a significant association between the distributions of site of lesion with age (Table 3) P value= 0.0141.

Gender wise distribution of site of lesion

Commonest site of lesion in females as well as in males was lymph node TB (n=121, 35.9% and n=82, 25% respectively). But lymph node was most common in females (n=121, 59.6%). More than half of the total pleural effusions (n=107, 60.7%) was in males. Genitourinary tract lesion also showed a similar male predominance (n=22, 68.7%) (Figure 5).

Annual trend of anatomical distribution of EPTB

Abdominal TB shows a rising annual trend from 2006 to 2015. But none other site of lesions show a consistent trend over the last 10 years. It is observed that after 2007 the case counts of pleural effusion and lymph node TB remain high. Lymph node or pleural effusion remains the most common site of lesion over the last ten years (Figure 6).

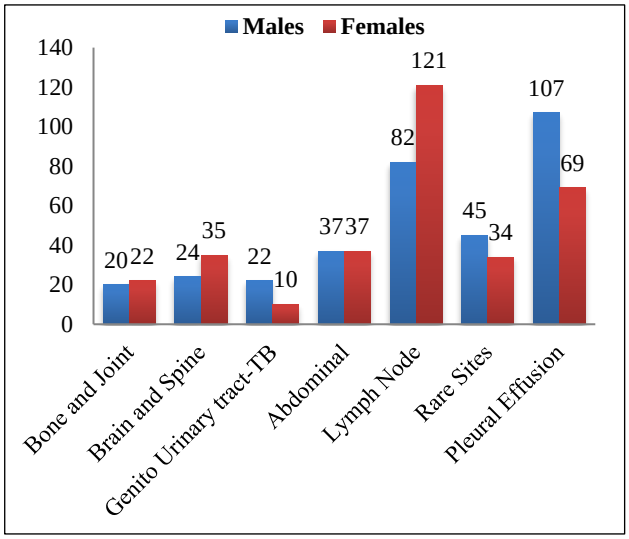

Figure 5. Gender wise distribution of site of lesion.

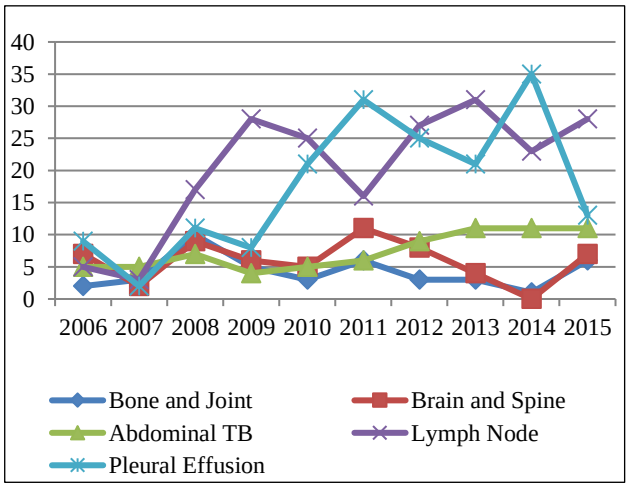

Figure 6: Annual trend of anatomical distribution of EPTB.

Table 3: Distribution of anatomical site of EPTB according to age.

Anatomical site of lesion	1-17 years	18-24 years	24-44 years	44-64 years	65-100 years	Grand Total
Bone and joint	3	9	14	10	6	42
Brain and spinal cord	4	5	24	17	9	59
Genitourinary tract TB	1	2	8	15	6	32
Abdominal TB	8	4	28	29	5	74
Lymph node TB	15	28	92	54	14	203
Rare and unspecified sites	5	10	20	32	12	79
Pleural effusion	10	20	55	60	31	176
Grand total	46	78	241	217	83	665
Chi-Square Test, p value= 0.0141						

DISCUSSION

EPTB is a significant public health issue which represent a diagnostic challenge. This retrospective study was conducted to find the trend of EPTB in this tertiary teaching care hospital in South India during the last 10 years. In this study among the 1488 new cases of tuberculosis of all forms, 665(44%) had EPTB. Index TB guidelines states National percentage of EPTB over total TB to be 15-20%.[12] Averages of 10-year data from RNTCP reports shows that in Kerala the percentage of EPTB over total TB is 21.7%.[2]

A study conducted by Prakasha SR et al, on mapping the pattern and trends of extra pulmonary tuberculosis at KS Hedge Medical college hospital from 2005 to 2011 showed that the percentage of newly diagnosed EPTB was 41.67%.[13] In another hospital based retrospective study conducted at Nepal it showed an EPTB percentage of 48.5%.[14]

In this study, there is a gradual and sustained increase in the number of extra pulmonary TB cases newly diagnosed and treated, though the numbers are marginally less in the last two years (2014 and 2015). The incidence percentage of EPTB over total TB also shows an increase from 44.9% in 2005 to 49.2% in 2013 and then a marginal fall in the last 2 years. A study conducted by Prakashaet SR et al, in K.S. Hegde Medical College Hospital, Mangalore showed a rise in number of EPTB from 2005 to 2011.[13]

Study by Peto HM et al, in United States showed a similar rising trends during 1993 to 2006.[15] They showed that from 1993 through 2006 total TB decreased but the proportion of decrease of PTB was more than the decrease in EPTB. It resulted in increase of percentage of EPTB over total TB from 15.7% of tuberculosis cases in 1993 to 21.0% in 2006.

Another 8 year (1996 to 2003) retrospective study conducted by VK Arora and Guptha R in Delhi showed that the 8 year annual trend in this study also showed that the number of EPTB cases have increased over successive years, while the percentage of pulmonary tuberculosis have decreased from 84 in 1996 to 78 in 2002 and that of EPTB rose significantly through 16% to 22% correspondingly.[16] EPTB to PTB ratio changed significantly from 1:5 at start to about 1:3.5 at study-conclusion.

This observation is in contrast with the falling trends of Kerala State and Nation as per the RNTCP reports of last 10 years.[2] The possible reasons for these can be:

This study centre being a tertiary care hospital there would possibly be more references and increased detection rate. Less detection rate of EPTB in peripheral centers. Less notification rate by private and public hospitals to RNTCP.

Higher proportion of migrant labourers and population exposed to migrant labourers are treated in this study centre. According to a 2013 survey by the Gulati Institute of Finance and Taxation, there are over 25 lakhs (2.5 million) domestic migrant labourers in Kerala from other states of India, as well as from Bangladesh and Nepal, in 2016 this figure stood over 40 lakhs (4 million). Of this 4 million, the maximum number of migrant labourers were in the districts treated by our hospital.[17]

On 2016, Swaminathan S, Director general of ICMR also showed that "In the global TB reports, India has underestimated TB data between 2000 and 2015. India has reported 56% of TB burden in 2014 and 59% in 2015.[18]

A study by Garzelli C et al, showed that immigration had effect on the epidemiology of tuberculosis in Italy which is a low TB incidence area.[19] They found that 12.9% of the total TB cases were attributed to transmission from immigrants to the local population. But they couldn't find a relation with immigrants and drug resistance. But to reach to a confirmation we must conduct a prospective study among the migrant population to find the prevalence of tuberculosis among them. Lymph node TB

is found to be the most common site of lesion accounting for 41% of all EPTB cases. It affects mainly the age group of 24-44 years. But in adults of age more than 44 years pleural effusion was the commonest site of lesion. With advancing age pleural effusion was found to the commonest site of lesion and affecting mainly the males (60.7%). Pleural effusion and genitourinary tract TB were common in males (60.7% and 68.7 % respectively) while bone and Joint TB (59.3%) in females.

Study by Bunger R et al, showed that 42% of EPTB cases were lymph node TB and 30% were endometrial tuberculosis.[20] A very similar, hospital based study conducted in a tertiary care hospital at K. S. Hegde Medical College Hospital, Mangalore, by Prakasha SR et al had 41.1% EPTB (528/1267) with a slightly greater male predominance (51%).[13] The most common site of lesion in this study was pleural effusion (28%) followed by lymph node TB (24.8%) and the least was Bone TB (12.3%).

In a study done by Peto HM et al, in United States found that among 253,299 cases, 73.6% were PTB and 18.7% were EPTB.[15] 40.0 % of the EPTB were lymph node TB, pleural TB constituted 19.8%, bone or joint TB 11.3%, genitourinary TB- 6.5%, meningeal TB 5.4%, peritoneal (4.9%), and unclassified EPTB (11.8%) cases.

Study conducted by Sharma SK et al, 35% of HIV negative EPTB patients was lymphnode TB.[5] Females were most commonly affected in the age group of 18-44 and commonest site of lesion in females as well as in males was lymph node TB. Similar female predominance was found in studies by Peto HM et al in United States and Arora VK and Guptha R in south Delhi.[15,16] There was no consistent year wise trend in the anatomical site of lesion of EPTB. But abdominal TB showed a rising trend. Lymph node or pleural effusion remains the most common site of lesion over the last ten years. Study by Prakasha SR et al, also couldn't describe a notable annual trend in the site of lesion affected.[13]

There are very limited studies on EPTB in Kerala as well as in our region. Apart from the causes common to all tertiary care centres, a possible reason for this rising trend in EPTB would be the influence of migrant population in our region since our hospital treats a population which gets exposed to maximum number of migrant labourers in Kerala. A prospective study should be conducted among the migrant population to draw a conclusion regarding this rising annual trend in EPTB in our hospital.

CONCLUSION

In this study EPTB shows an increasing trend from 2006 to 2015 which is in contrast to the falling state and national trends. In the global TB reports, India has underestimated TB data between 2000 and 2015. India has reported 56% of TB burden in 2014 and 59% in 2015. There are no notable annual trends in the clinical spectrum except for the rising annual trend of abdominal TB. But lymph node or pleural effusion remains the most common site of lesion over the last ten years. Lymph node TB contributes to the maximum number of cases, but pleural effusion is the commonest site of lesion as age advances. Present study has shown a female gender predominance in the age group of 18 to 44 years which should reflect as the shadows of the future. So, the importance of TB control is essential for the nation building. 24-44 years is the most common age group affected.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Park K. Preventive and social medicine. 23rd ed. Jabalpur: M/s Banarsidas Bhanot; 2015.
2. Central Tuberculosis Division, Government of India. TB India 2015, annual status report, RNTCP. Available at: https://tbcindia.gov.in/showfile.php?lid=3166.
3. World Health Organization. Global tuberculosis report 2014, 2014. Available at: http://www.who.int/tb/publications/global_report/en/.
4. Kumar V, Abbas AK, Aster JC, editors. Robbins basic pathology. 19th ed. Philadephia: Elsevier Saunders; 2013.
5. Sharma SK, Mohan A. Extrapulmonary tuberculosis. Ind J Med Res. 2004;120(4):316-53.
6. Horne DJ, Narita M. Extrapulmonary Tuberculosis. BMJ Best Practice found on best practice, 2018. Available at: http://bestpractice.bmj.com/best-practice/monograph/166/basics/epidemiology.html.
7. Kumar P, Sharma N, Sharma NC, Patnaik S. Clinical profile of tuberculosis in patients with HIV Infection/AIDS. Indian J Chest Dis Allied Sci. 2002;44:159-63.
8. Kapoor VK. Modern management f abdominal tuberculosis. In: Johnson D Colin, Irving T, editors. Recent advances in surgery. 1st ed. New Delhi: Jaypee Brothers Medical Publishers (p) Ltd; 2013:156-169.
9. Govindasamy M, Srinivasan T, Varma V, Mehta N, Yadav A, Kumaran V, Nundy S. Biliary tract tuberculosis-a diagnostic dilemma. J Gastrointes Surg. 2011 Dec 1;15(12):2172-7.
10. Sinhasan SP, Puranik RB, Kulkarni MH. Abdominal tuberculosis may masquerade many diseases. Saudi J Gastroenterol. 2011;17(2):101-3.
11. Central TB division, Ministry of Health and Family Welfare. RNTCP Training course for Program Manager (Module 1-4) 2011. Available at: https://tbcindia.gov.in/index1.php?lang=1&level=3&sublinkid=4262&lid=2906.

12. Central TB division, Ministry of Health and Family Welfare. Index-TB Guidelines 2016. 2016. Available at: https://tbcindia.gov.in/showfile.php?lid=3245.
13. Prakasha SR, Suresh G, D'sa IP, Shetty SS, Kumar SG. Mapping the pattern and trends of extrapulmonary tuberculosis. J Global Infect Dis. 2013 Apr;5(2):54.
14. Sreeramareddy CT, Panduru KV, Verma SC, Joshi HS, Bates MN. Comparison of pulmonary and extrapulmonary tuberculosis in Nepal-a hospital-based retrospective study. BMC Infect Dis. 2008 Dec;8(1):8.
15. Peto HM, Pratt RH, Harrington TA, LoBue PA, Armstrong LR. Epidemiology of extrapulmonary tuberculosis in the United States, 1993-2006. Clin Infect Dis. 2009 Nov 15;49(9):1350-7.
16. Arora VK, Gupta R. Trends of extra-pulmonary tuberculosis under revised national tuberculosis control programme: A study from South Delhi. Indian J Tuber. 2006 Apr 1;53(2):77-83.
17. Joseph MP, Narayana D, Venkiteswaran CS. Study of Domestic Migrant Labour in Kerala. Gulati Institute of Finance and Taxation. Submitted to Labour and Rehabilitation Department Government of Kerala; February, 2013.
18. Swaminathan S. The End TB strategy. The Hindu Week End. 2016. Available at: https://www.thehindu.com/todays-paper/tp-opinion/The-End-TB-strategy/article15570601.ece
19. Garzelli C, Lari N, Cuccu B, Tortoli E, Rindi L. Impact of immigration on tuberculosis in a low-incidence area of Italy: a molecular epidemiological approach. Clin Microbiol Infect. 2010;16(11):1691-7
20. Bunger R, Singh VA, Mengi S, Pathania D, Vohra P. Demographic analysis of extra pulmonary tuberculosis at a tertiary care hospital in north India. Int. J. Life Sci Bt Pharm Res. 2014;3(2250-3137):150-4.

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