

Intensive Case Finding of TB in Children Using the MCH approach

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Outline



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- ▶ Study Objectives
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Background

- ▶ Ethiopia is among the 22 High burden countries with TB burden – 10th highest Globally & 3rd highest in Africa
- ▶ The rate of notification lower than incidence of TB (increased from 58 to 111 per 100,1000 by 2012)
- ▶ One of the 27 countries with high burden MDR-TB (increase from 1.6% in 2005 to 2.3 % in 2014)
- ▶ Childhood TB case account for 13% and notification -13 per 100,000
- ▶ TB control program efforts
 - Decentralization with integration of TB with HIV ,MCH
 - Adoption of WHO guidelines
 - Integration of services of Tb with HIV , MCH
 - Partnerships for program implementation and research

Study Objectives

- ▶ To assess the yield of intensive case finding of TB among children under 5 using screening tool in MCH services
- ▶ To describe associated comorbidities and interventions namely nutritional status and HIV among children with TB and
- ▶ To describe risk factors and outcome of interventions for childhood TB

Methods

Study site and design

- ▶ Cross-sectional study- April 2015 to May 2016
- ▶ St Paul Hospital Millennium Medical College , Addis Ababa, Ethiopia
- ▶ Felege Meles Health Center – a catchment health facility
- ▶ Training of Health care providers and study team – Using WHO guidelines



Methods

Data collection and analysis

- ▶ Structured questionnaire to screen eligible children
- ▶ Further investigation based on examination by attending physician (e.g. chest X-ray , GeneXpert)
- ▶ Record review and tracking of cases to determine outcome
- ▶ Data analyzed using STATA software (version 13)



Enrollment Criteria

- ▶ Any child under 5 years of age that exhibited at least one of the following signs or symptoms:
 - ▶ Cough > 2 weeks, non remitting and unexplained
 - ▶ Weight loss (>5% reduction in weight compared with highest weight recorded in the last 3 months) or failure to thrive (clear deviation from previous growth trajectory) AND not responding to nutritional rehabilitation (or ARV therapy if HIV infected)
 - ▶ Persistent (> 1 wk) and unexplained fever (>38C) reported by guardian or objectively recorded at least once
 - ▶ Persistent, unexplained lethargy or decrease in playfulness/activity reported by the parent/caregiver
- ▶ All under 5 children with hx of close contact (household) with TB, suspected or diagnosed with HIV

Baseline characteristics

Variables	Child clinic OPD/IPD/ER 79 (46.8)	Referred from ART/TB/ANC/PMCTC 90 (53.2)	Total n (%) 169 (100)
Age in months*: median(IQR)	16 (8,26)	14 (4,24)	14 (6,25)
Gender: n (%)			
<i>Female</i>	44 (55.7)	49 (54.4)	93 (55.0)
<i>Male</i>	35 (44.3)	41 (45.6)	76 (45.0)
HIV status: n (%)			
<i>Positive</i>	8 (10.4)	11 (12.2)	19 (11.4)
<i>Negative</i>	46 (59.7)	39(43.3)	85 (50.9)
<i>Unknown</i>	23 (29.9)	40 (44.4)	63 (37.7)
CD4 count: median (IQR)	208.5 (174.5,1079.5)	1061.5 (470,1174)	865.5 (236,1174)
Normal hemoglobin: Mean <u>+</u> (SD)	11.4 <u>+</u> 2.8	12.3 <u>+</u> 1.4	11.7 <u>+</u> 2.5

Baseline characteristics - Nutritional status

Variables	Child clinic OPD/IPD/ER 79 (46.8)	Referred from ART/TB/ANC/PMCTC 90 (53.2)	Total n (%) 169 (100)
Feeding for the first 6 months: n (%)			
<i>Exclusive breast feeding</i>	59 (74.7)	76 (84.4)	135 (79.9)
<i>Mixed /Formula feeding</i>	20 (25.3)	14 (15.6)	34 (20.1)
Z-scores of Weight for Age ⁺ : n (%)			
<i>Normal</i>	28 (59.6)	35 (85.4)	63 (71.6)
<i>Moderate wasting</i>	5 (10.6)	2 (4.9)	7 (7.9)
<i>Severe wasting</i>	14 (29.8)	4 (9.8)	18 (20.5)
Z-scores of Weight for Height [‡] : n (%)			
<i>Normal</i>	28 (56.0)	39 (95.1)	67 (73.6)
<i>Moderate under nutrition</i>	7 (14.0)	0 (0)	7 (7.7)
<i>Severe under nutrition</i>	15 (30.0)	2 (4.9)	17 (18.7)

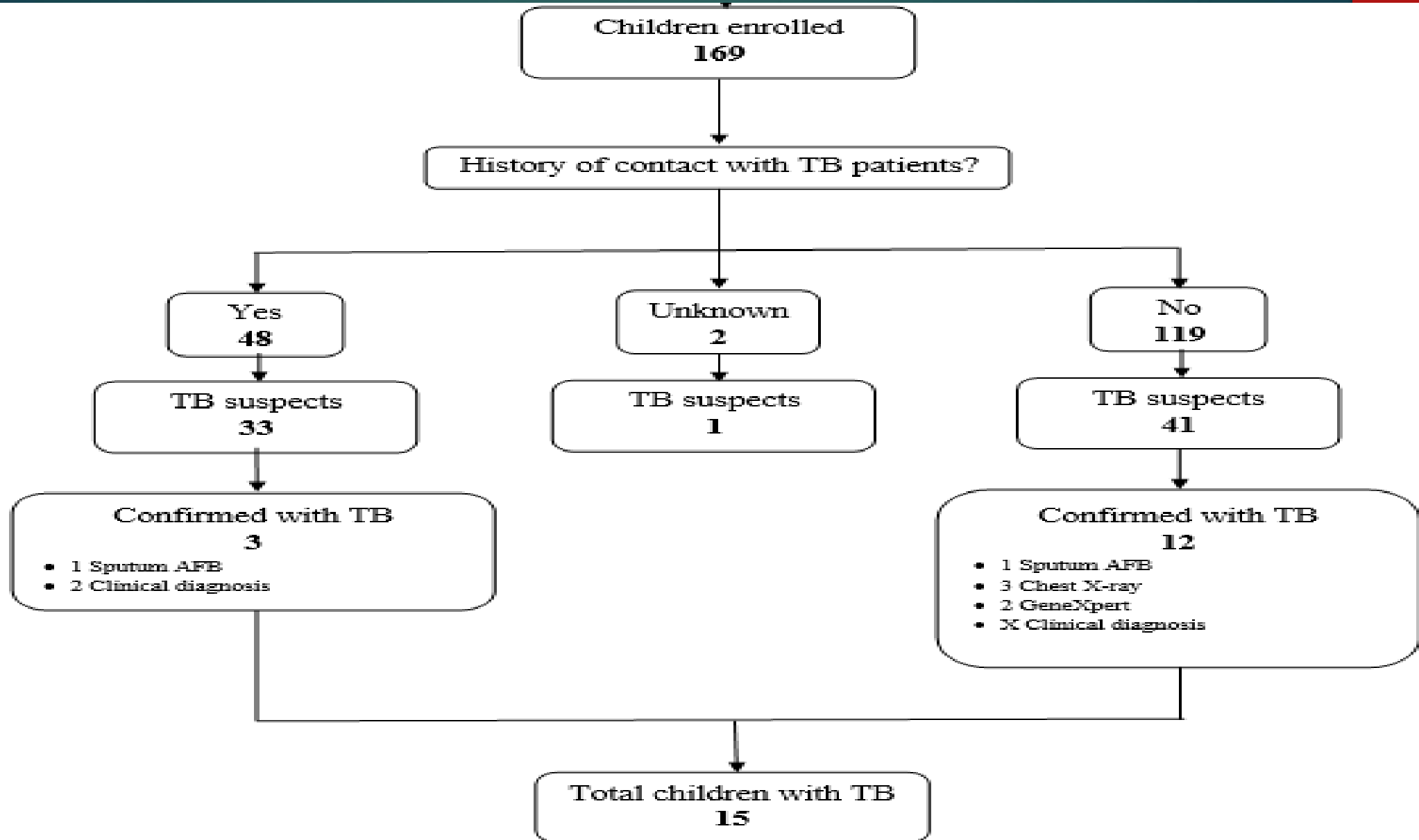
Baseline characteristics - continued

Variables	Child clinic OPD/IPD/ER 79 (46.8)	Referred from ART/TB/ANC/PMCTC 90 (53.2)	Total n (%) 169 (100)
BCG vaccine: n (%)			
Yes	70 (88.6)	90 (100.0)	160 (94.7)
No (1-Unknown)	9 (11.4)	0 (0)	9 (11.4)
Nutritional status: n (%)			
Normal	51 (64.6)	86 (95.6)	137 (81.1)
Malnourished (moderately or severely)	28 (35.4)	4 (4.4)	32 (18.9)
INH prophylaxis?			
Yes	3 (4.4)	3 (3.4)	6 (3.8)
No	61 (88.4)	54 (61.4)	115 (73.3)
Unknown	5 (7.3)	31 (35.2)	36 (22.9)

Baseline characteristics – TB screening

Variables		Child clinic OPD/IPD/ER 79 (46.8)	Referred from ART/TB/ANC/PMCTC 90 (53.2)	Total n (%) 169 (100)
Cough for over 2 weeks: n (%)				
	<i>Yes</i>	53 (67.1)	19 (21.1)	72 (42.6)
	<i>No</i>	26 (32.9)	71 (78.9)	97 (57.4)
Fever for over 2 weeks: n (%)				
	<i>Yes</i>	50 (63.3)	15 (16.7)	65 (38.5)
	<i>No</i>	29 (36.7)	75 (83.3)	104 (61.5)
Noticeable weight loss for over 2 weeks				
	<i>Yes</i>	35 (44.3)	7 (7.8)	42 (24.9)
	<i>No</i>	44 (55.7)	83 (92.2)	127 (75.1)
Night sweats fever for over 2 weeks				
	<i>Yes</i>	30 (38.0)	5 (5.6)	35 (20.7)
	<i>No</i>	49 (62.0)	85 (94.4)	134 (79.3)

Study flow



Confirmed TB cases and Rx outcome

No.	Age in months	AFB	GeneXpert	Clinical signs and Symptoms				Chest X-ray	History of Contact	HIV status	Distance from HC (Kms)	Outcome
				Cough	Fever	Weight Loss	Night sweat					
1	60	M	M	No	Yes	Yes	Yes	M	No	ND		Loss to F/up
2	30	Neg	M	Yes	Yes	Yes	No	Neg	No	Pos	M	Died
3	20	Neg	Neg	Yes	Yes	Yes	Yes	Pos	No	Neg	Abroad	Completed Tx
4	48	Neg	M	Yes	Yes	Yes	No	ND	No	Neg	200	On Tx
5	57	ND	Neg	Yes	Yes	Yes	Yes	Neg	No	Neg		Loss to F/up
6	15	Pos	Neg	No	Yes	No	Yes	Pos	No	Neg		Cured
7	11	M	M	Yes	Yes	Yes	Yes	M	No	Pos		Loss to F/up
8	29	ND	ND	Yes	Yes	Yes	Yes	Neg	No	Neg		On Tx
9	4	Neg	Neg	Yes	Yes	Yes	Yes	Pos	No	Neg	68	Cured
10	24	ND	ND	Yes	Yes	No	No	Pos	No	Neg	25	Cured
11	3	Pos	Neg	Yes	Yes	Yes	Yes	Neg	Yes	Neg		Loss to F/up
12	7	Neg	Pos	Yes	Yes	Yes	Yes	Neg	No	Neg	120	Cured
13	36	Neg	Neg	Yes	No	Yes	No	Neg	Yes	Neg	45	Cured
14	14	Neg	Neg	Yes	Yes	Yes	Yes	Neg	Yes	Neg	350	On Tx
15	13	Neg	Pos	Yes	Yes	Yes	No	Neg	No	ND		MDR-TB

Key: Pos- positive, Neg- Negative, ND- Not done, M-Missing, Mode of diagnosis

Odds Ratio

Variables	Have TB?		OR 95 % CI	P-value
	Yes	No		
	15 (8.9)	154 (91.1)		
Age group in years [‡]				
Less than 1	4 (6.3)	60 (93.7)	1	0.693
Between 1 to 2	5 (8.1)	57 (91.9)	1.3 (0.3,5.1)	
2 to 5	6 (14.3)	36 (85.7)	2.5 (0.7,9.5)	
Sex				
Male	7 (9.2)	69 (92.8)	1	0.890
Female	8 (8.6)	85 (91.4)	0.9 (0.3,2.7)	
HIV status [‡]				
Positive	2 (10.5)	17 (89.5)	1	0.774
Negative	11 (13.2)	72 (86.8)	1.3 (0.3,6.2)	
Unknown	1 (1.6)	62 (98.4)	0.12 (0.03,0.51)	
Feeding (First 6 months)				
Exclusive breast feeding	13 (9.6)	122 (90.4)	1	0.497
Formula and Mixed feeding	2 (5.9)	32 (94.1)	0.6 (0.1,2.7)	
History of contact with TB patients ⁺				
No	12 (10.1)	107 (89.9)	1	0.437
Yes	3 (6.3)	45 (93.7)	1.7 (0.5,6.2)	
Nutritional Status				
Normal	8 (5.8)	129 (94.2)	1	0.007*
Malnourished	7 (21.9)	25 (78.1)	4.5 (1.5,13.6)	

*Statistically significant at 0.05, [‡]2 the children care takers reported not to know whether the children ever had TB contacts, missing data: [#]1, [#]3, [#]87

Results Summary

- ▶ Nearly all children enrolled had BCG vaccination (94%)
- ▶ 48/169 (28.4%) of enrolled children had history of TB contact
- ▶ 19% of enrolled children had moderate/severe under nutrition vs 21.9% among those with confirmed TB
- ▶ Of the 112 for whom HIV test results were available, 19 were positive
- ▶ Only 6 (3.6%) children with history of contact on IPT – further evaluation during the study 40 children were put on INH
- ▶ 75 (44%) of the children were further investigated for TB
- ▶ 15 (8.9%) cases were reported as TB and started on Rx
- ▶ 4 cases were confirmed bacteriologically (2 via AFB, 2 via GeneXpert)

Challenges/Limitations



- ▶ Administrative and logistical barrier
- ▶ Challenges linking maternal records and services with Child records
- ▶ High turnover of staff
- ▶ Stock out of diagnostic supplies (e.g. sample containers for GeneXpert)
- ▶ Breakdown in follow-up due to gaps in referral system
- ▶ Poor connectivity & internet access limiting communication
- ▶ Financial barrier

Conclusion



- ▶ There are multiple entry points for case finding of TB
- ▶ High index of suspicion and use of screening tool can enhance early case detection of TB in children
- ▶ Challenges for early detection and intervention include : limited contact tracing & tracking and weak integration of services
- ▶ Gaps in referral systems (e.g lack of communication) and stock out of diagnostics further limit the potential for effective interventions
- ▶ Implementation of IPT is low despite available opportunities for its use

Recommendations



- ▶ Strategic approach for addressing barriers for integration of TB in MCH services – organization of services , QI approach
- ▶ Institutionalization of tracking system for children and their families with TB - community engagement
- ▶ Innovative approach using IT
- ▶ Building capacity for quality assurance and efficient laboratory services is critical to enhance confirmation of TB in children
- ▶ Enhance research capacity and training of care providers for sustainable models of practice to end TB

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