

Knowledge and Practice of Private Medical Practitioners regarding Diagnosis and Treatment of Paediatric Tuberculosis in Mogadishu

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Abstract

Background: Somalia has been at civil war for the last two decades and the public health system has virtually collapsed. The majority of the community seeks care from the private health sector. **Objectives:** To assess the knowledge and practice of private medical practitioners concerning Paediatric Tuberculosis (TB) diagnosis and treatment in Mogadishu and their level of adherence to the National or International guidelines using a cross-sectional study design. **Methods:** A cascade approach was used to identify private medical practitioners who had experience with treating paediatric TB. A standard tool was used to collect information on their knowledge of diagnosis and treatment among those who consented to participate in the study. In addition, prescriptions were retrieved from pharmacies in Mogadishu to enable independent verification of prescription practice and adherence to National or International guidelines. **Results:** There were 39 study participants, 31 medical doctors and 8 clinical officers. The most common symptoms used by clinicians to diagnose TB among children were fever for more than 2 weeks (87.19%), cough for more than 2 weeks (89.74%) and loss of weight (92.31%). A few, 5 (12.82%), identified history of TB contact as a suspicion of paediatric TB. More than half of the practitioners, 21 (53.85%), relied on chest x-ray and erythrocyte sedimentation rate for the diagnosis of TB in children. The majority (74%) of the clinicians knew the correct treatment for pulmonary TB in children. Further to this 60% and 79.5% respectively of the clinicians did not know the appropriate treatment regimens extra-pulmonary TB and TB/HIV co-infection. The lack of knowledge was confirmed by review of the prescriptions. Of the 48 prescriptions collected, only one prescription was correctly prescribed according to the weight of the child and even more worrying only 18 (39%) of the anti-TB drugs prescribed were Fixed Dose Combinations

(FDC) approved by the WHO. **Conclusion:** Private medical practitioners in Mogadishu have significant gaps in their knowledge and practice with regard to the management of paediatric TB.

Keywords

Paediatric TB, Diagnosis of TB in Children

1. Introduction

TB remains one of the major health problems and the second leading infectious cause of mortality around the world [1]. In 2011, there were 0.5 million new cases and 64,000 deaths in children according to the WHO [1]. In 2011, the TB incidence in Somalia was estimated at 300 cases per 100,000 persons, but fewer than half of the estimated cases are actually detected [2]. Children may account for up to 15% of the total TB burden in Africa [3].

In Somalia, TB is one of the major public health crises. Multi-drug resistant TB was detected in 5.2% of persons with newly diagnosed TB and 40.8% were re-treated patients. These levels appear to be the highest in the south-central region [2]. Somalia has been at civil war for the last 2 decades and the health infrastructure has been destroyed with only a few public hospitals still functioning. Most health facilities are run by international non-governmental organizations.

It is estimated that only 20% of the Somali population accesses modern health services, 70% of them seeking care from the private health sector [4]. The majority of them are women and children including children suffering from TB [5]. However the knowledge and practice of private medical practitioners regarding the management of TB may not be optimal. A study done in North-Western Somalia showed that few doctors follow the National treatment guidelines for the control of TB [6]. In this study the knowledge and practice of the private medical practitioners regarding the diagnosis and treatment of paediatric TB and their level of adherence to the national or international diagnostic and treatment guidelines were assessed.

2. Methodology

A cross sectional survey was carried out in Mogadishu, the capital and the largest city in Somalia. The eligible population included all the private medical practitioners in Mogadishu. All medical practitioners working in public health system and those not managing paediatric populations were excluded from the study. The total number of clinicians surveyed was 39. The author visited the clinicians in their clinics and requested their participation in the study. On signing the consent form, they were given a standardized self-administered tool to evaluate their knowledge and practice. The tool collected data on the clinician's qualifications (medical doctor or clinical officer), years of practice and whether they had managed a child with TB in the 2 years preceding study. The study in-

strument also collected data on clinical symptoms and signs used for diagnosis, the co-morbidities commonly associated with TB in children, investigations and the knowledge regarding the recommended treatment of paediatric TB. The questionnaire also collected data related to whether the clinicians had attended any TB-related training 2 years prior to the study and the availability of National or WHO guidelines. Challenges around service delivery were documented such as the availability of drugs, referral services and follow up of cases. The researcher also collected 48 prescriptions written by different clinicians from different pharmacies in Mogadishu and analyzed them to assess the practice of clinicians in the treatment of paediatric TB and adherence to the national or who guidelines.

The data was analysed using the SPSS version 17. Descriptive statistics including mean, median, standard deviation and frequency distribution were used. Comparison was done between clinicians who had and those who did not have a copy of the Somali national or WHO guideline using the Chi-square test.

Ethical clearance was obtained from the Kenyatta National Hospital/University of Nairobi ethical committee and the Ministry of Public Affairs in Somali, Department of Health. A consent form was signed by the private practitioners who met the inclusion criteria and confidentiality was maintained throughout the study.

3. Results

The data was collected from 13 of the 16 districts in Mogadishu. The researcher identified 51 clinicians who were eligible for this study, but the respondents were 39. The main reasons for non-participation were: being too busy (5), had participated in the pretest (5) and missed appointment (1). Out of the 39 practitioners, there were 31 (79.5%) medical doctors and 8 (20.5%) clinical officers as shown in **Table 1**. Thirty-six (92.3%) of the clinicians enrolled in the study had managed paediatric TB in the 2 years preceding the study. A small number, 9 (23.1%) of the 39 clinicians had received TB-related training in the two years period preceding the data collection. Thirteen (33.3%) of the clinicians had a copy of the national or WHO guidelines in their clinic.

A comparison was made between the clinicians who had and those who did not have a copy of the national or WHO guidelines as shown in **Table 2**. More than half (53.8%) of the clinicians who had a copy of the national or WHO guideline had attended TB-related training in the preceding 2 years while 7.7% of those who did not have a copy of these guidelines had received training. This difference was significant (p-value 0.001). The clinicians who had the national or WHO guideline had better knowledge of the recommended regimens for paediatric TB treatment. However this difference was significant only for Miliary TB (p-value 0.03)

3.1. Diagnosis of Paediatric TB

The symptoms that most frequently triggered the diagnosis of paediatric TB dis-

Table 1. Characteristics of the study participants.

Characteristics	Total (%)
Title	
Medical doctor	31 (79.5%)
Clinical officer	8 (20.5%)
Years of practice	
>2 years	8 (20.5%)
2 - 5years	8 (20.5%)
5 - 10 years	12 (30.8%)
>10 years	11 (28.2%)
Managed child with TB in the last 2 years	
Yes	36 (92.3%)
No	3 (7.7%)
Attended any TB training in the last 2 years	9 (23.1%)
Has a copy of national or international TB guidelines	13 (33.3%)

Table 2. Comparison between clinicians who had a copy of the national or WHO guidelines and clinicians who did not have a copy.

Characteristics	Total N = 39	Copy of national or WHO guideline		P-value
		Yes (N = 13)	No (N = 26)	
Attended TB training	9	7 (53.8%)	2 (7.7%)	0.001
Correct symptoms (National & WHO)				
TB contact + 3 correct symptoms	5	1 (7.7%)	4 (15.4%)	0.1
Only 3 correct symptoms	31	12 (92.3)	19 (73.1%)	
Knows recommended Treatment of pulmonary TB	29	10 (76.9%)	19 (73.1%)	0.7
Knows recommended Treatment of TB meningitis	18	10 (76.9%)	8 (30.8%)	0.6
Knows recommended treatment of Miliary TB	15	8 (61.5%)	7 (26.9%)	0.03
Knows recommended Treatment of TB in the context of HIV	9	5 (38.5%)	4 (15.4%)	0.1

ease were fever for more than 2 week (87.2%), cough for more than 2 weeks (89.7%), loss of weight (92.3%) and night sweating (64.1%). A small number, 5 (12.8%) of the respondents used history of TB contact to make a diagnosis of paediatric TB. Features not suggestive of paediatric TB like history of trauma were cited by 15% of the practitioners.

The most frequently used investigations in the diagnosis of paediatric TB were a combination of CXR and ESR, or CXR alone by 21 (53.8%) and 16 (41.0%) respectively. None of the clinicians considered Mantoux test as a tool for the investigation of TB in children.

3.2. Recommended Treatment Regimens for Paediatric TB

More than two thirds, 29 (74.4%), of the clinicians mentioned the recommended treatment of pulmonary TB but with 11 (28.2%) stating the correct regimen for TB meningitis as shown in **Table 3**. Fifteen (38.5%) of the respondents knew the recommended regimen for miliary TB. The majority of practitioners 28 (71.79%) did not know the recommended regimen for treatment of TB co-infected with

Table 3. Individual dosage calculation based on the weight of the child according to Somali National or WHO guidelines.

Drug	Dosage calculation as per Somali and WHO guidelines		P-value
	Appropriate	Inappropriate	
Rifampicin	21 (43.7%)	27 (56.2%)	0.4
Isoniazid	2 (4.2%)	46 (95.8%)	<0.001
Pyrazinamide	3 (6.2%)	25 (93.7%)	<0.001
Ethambutol	4 (57.1%)	3 (42.9%)	0.7

HIV infection. About 90% of the practitioners were aware of where TB patients could get free anti-TB drugs but one third (33.33%) referred their TB patients to those centers opting to treat the remaining two thirds in their facilities.

On individual dosage calculation, isoniazid was incorrectly prescribed in 95% of the patients followed by pyrazinamide (86%) and one prescription (2.1%) was correctly written according to the weight of the child of the prescriptions collected from the pharmacies in Mogadishu as shown in **Table 3**. The survey found that private medical practitioners prescribed different fixed dose combination (FDC) for the treatment of TB in children. However, 18 (39%) of the prescriptions used the recommended FDC approved by the WHO, while the remaining 61% were using FDCs that were not recommended by the WHO (**Table 4**). These drugs are: [R 120 mg INH 100 mg & Z 300 mg], [R 120 mg H 50 mg & Z 300 mg] and [R 150 mg INH 75 mg].

4. Discussion

This study revealed that the knowledge and practice of private practitioners regarding the diagnosis and treatment of paediatric TB in Mogadishu was not satisfactory. Although the majority of the clinicians used cough for more than 2 weeks, fever for more than 2 weeks and weight loss for the diagnosis of TB in children, few clinicians 5 (12.8%) stated history of TB contact while about 15% of the clinicians mentioned features not suggestive of paediatric TB like history of trauma. Similar results were found in a study done in Eldoret, Kenya, where few clinicians (12.8%) were aware of the history of TB contact as one of the important clinical features for the diagnosis of TB in children [7]. The majority of the clinicians did not mention the recommended treatment of paediatric TB and only one had correctly prescribed the correct dosage according to the weight of the child. The reason for this poor knowledge and performance may have been because about 77% of the clinicians had not received any TB-related training in the 2 years prior to the study and only one third of the clinicians had a copy of the national or WHO guidelines in their clinics.

More than half of the clinicians used CXR and ESR for the diagnosis of TB in children, while 41.3% relied on CXR alone for the investigation of TB in children. None of the clinicians recommended Tuberculin skin testing (TST) for the diagnosis of TB in children. TST is often not available in low resource setting

Table 4. Knowledge of private medical practitioners regarding the recommended treatment regimen of paediatric tuberculosis.

Disease	Regimen	Total (%)	Correct response
Pulmonary TB	Induction phase		
	RHE	1 (2.6%)	
	RHZ	29 (74.4%)	RHZ = 29 (74.4%)
	RHZE	8 (20.5%)	
	Continuation phase		
	Don't know	1 (2.6%)	
TB Meningitis	RH	38 (97.4%)	RH = 38 (97.4%)
	Induction phase		
	Don't know	7 (17.9%)	
	RHE	3 (7.7%)	
	RHS	1 (2.6%)	RHZE = 11 (28.2%)
	RHS + Steroids	1 (2.6%)	
	RHZ	7 (17.9%)	
	RHZE	11 (28.2%)	
	RHZE + Ceftriaxone	1 (2.6%)	
	RHZE + Steroids	2 (5.13%)	
	RHZES	4 (10.6%)	
	RHZS	1 (2.6%)	
	RHZS + Steroids	1 (2.6%)	
	Continuation phase		
Don't know	7 (17.9%)	RH = 32 (82.0%)	
RH	32 (82.0%)		
Miliary TB	Induction phase		
	Don't know	16 (41.0%)	
	RHE	2 (5.1%)	RHZE = 15 (38.6%)
	RHS	1 (2.6%)	
	RHZ	3 (7.7%)	
	RHZE	15 (38.6%)	
	RHZE + Steroids	1 (2.6%)	
	RHZS + Steroids	1 (2.6%)	
	Continuation phase		
	Don't know	16 (41.0%)	RH = 23 (59.0%)
	RH	23 (59.0%)	
TB/HIV co-infection	Induction phase		
	Don't know	28 (71.8%)	RHZE = 9 (23.1%)
	RHES	1 (2.6%)	
	RHZE	9 (23.1%)	
	RZ	1 (2.6%)	
	Continuation phase		
	Don't know	31 (79.5%)	RH = 8 (20.5%)
RH	8 (20.5%)		

R = Rifampicin, H = Isoniazid, Z = Pyrazinamide, E = Ethambutol, S = Streptomycine.

areas and this may be the reason why clinicians did not consider it as a tool for investigation of TB in children [8]. Globally, the majority of private practitioners rely on CXR for diagnosis of TB. A study done in the India and the Philippines found that 89.5% and 87.9% respectively of the participants recommended CXR for diagnosis of TB [9] [10].

The researcher found that the clinicians were more familiar with the recommended treatment of pulmonary TB when compared to that for extrapulmonary TB and TB/HIV co-infection. This is may be due to the high burden of pulmonary TB, complexity in the diagnosis of extrapulmonary TB and the low ende-

micity of HIV in Somalia. The clinicians who had a copy of the national or WHO guidelines were more likely to recommend the appropriate treatment regimen as compared to those who did not have these guidelines. Different studies done in different countries have found that clinicians in the private sector are not familiar with the recommended treatment of TB. A cross-sectional study done in North-Western Somalia by Suleiman *et al.*, revealed that only 4 (7.5%) of the 53 clinicians recruited into the study recommended the correct regimen according to the National TB guideline [6]. Another study done by Ayaya *et al.*, in Eldoret Kenya, revealed that only 23.9% of the regimens mentioned were recommended by the National Leprosy and Tuberculosis programme. The rest were inappropriate regimens [7]. A survey done in Delhi India, found that only 29.4% of the regimens were correctly prescribed according to the Indian National guidelines [10]. Portero *et al.* in the Phillipines also found that the majority (89%) of the private practitioners in the study used inappropriate regimens for the treatment of TB [11].

The majority of the private practitioners (89.74%) were aware of where TB patients could get free anti-TB drugs, but few of them (33.33%) referred to the health center and consequently patients treated in private sector are more likely to be not notified to the NTP. A study done in North-west Somalia found that out of 32 (64%) doctors who had treated TB patients, only 1 had reported to the authorities [6]. Another study done in Pakistan by Ahmed *et al.* in 2009 showed that the majority (80%) of the private doctors participated in the study treated their patients in their clinic without referral [12].

The survey found that the majority of the patients were prescribed for inappropriate dosages of anti-TB drugs according to the prescriptions collected from the pharmacies. A similar finding was made by a research done in Nairobi, Kenya by Musila where of the 97 patients recruited in the study, only 19 (19.6%) of the patients had the correct dosage [13]. On individual dosage calculation, isoniazid was correctly prescribed for 2 (4.17%) of patients, while rifampicin and pyrazinamide were prescribed correctly in 21 (43.75%) and 3 (10.34%) of patients respectively. These figure were likely similar to the Dr. Musila' study in which isoniazid was incorrectly prescribed in 71.9% of the patients followed by rifampicin (59.2%) and pyrazinamide (54.7%) respectively [13]. Because the treatment of TB requires multidrug regimens, WHO approved fixed dose combination for treatment of TB [14]. Of the 48 prescriptions collected, 61% of patients were given FDC not approved by WHO Model List of Essential Medicines. A recent survey and testing of anti-TB drugs in Somalia done by the Ministry of Health in Somalia revealed wide spread existence of sub-standard drugs in Mogadishu pharmacies. These include RIP-PED, Rizide, Rifamide, Rifapyrazide, Refalin, RIFO, RIPO Forte, FDC of Rifampicin-Isoniazid-Pyrazinamide-Ethambutol, TPUTE-RIPE and Ripezide. This quality analysis of anti-TB drugs in Mogadishu was done in the National Quality Control Laboratory in Kenya [15]. The researcher found that most anti-TB drugs that were prescribed for the children with TB were those substandard drugs. This shows that children managed in the

private sector were receiving anti-TB drugs of poor quality.

The main limitation of the study was that there was limited data related to private medical practitioners registered by the department of health in Somalia. The researcher was forced to collect the data from different districts of Mogadishu, asking assistance from medical practitioners, pharmacists and other health workers to find out private medical practitioners that were running private hospitals or clinics in their district. This could affect the generalizability of the study to the clinicians in Mogadishu. In summary, the poor level of knowledge and practice of the practitioners in Mogadishu regarding diagnosis and treatment of paediatric TB, reflecting the clearly need for urgent TB-related training to the private sector.

5. Conclusion

There was incomplete knowledge regarding the diagnosis and treatment of paediatric TB. The majority of the patients were prescribed for anti-TB drugs with inappropriate dosages. This is related to the limited access of the TB-related training and national or international TB guidelines.

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