



KNOWLEDGE, PRACTICES AND PERCEPTION OF HEALTH CARE WORKERS ON DIAGNOSIS OF CHILDHOOD TUBERCULOSIS: A CASE STUDY OF BURETI SUB COUNTY, KERICHO, KENYA.

Kirui Collins Kipkosgei*	School of Health Sciences, Dept. of Public Health, Jaramogi Oginga Odinga University of Science and Technology, Kisumu Kenya. *Corresponding Author
Eunice Omesa	National Tuberculosis and Leprosy Programme Kenya.
Choge Joseph	School of Health Sciences, Dept. of Clinical Medicine, University of Kabianga.
George Ayodo	School of Health Sciences, Dept. of Public Health, Jaramogi Oginga Odinga University of Science and Technology, Kisumu Kenya.

ABSTRACT **Background:** Despite the advances in the diagnosis of tuberculosis, effective diagnosis remains a challenge among children. Several countries have rolled out effective diagnostic methods but capacity of health care workers to achieve expected results have not been evaluated. The objective of this study was therefore to assess the knowledge, practices and perception of health care workers on diagnosis of childhood tuberculosis at public and private health facilities in Bureti sub-county, Kenya. This is important for effective diagnosis hence reduced childhood deaths.

Methods: A cross-sectional study was carried out on 44 health care workers in 10 TB clinic in both public and private health facilities. The data collection tools were key informant guide and semi-structured questionnaire.

Results: Majority of Health care workers (45.5%) have poor knowledge, with 31.8% mentioning that *Mycobacterium leprae* also causes TB. On practices, 68% confirms that gene expert is available in the health facilities but only 30% can interpret its results and 20% do not know how to use it. Majority of the respondents (61.4%) believe stigma still remain a challenge in diagnosis of TB.

Conclusion: Knowledge, practices and perception need to be improved among the health care providers for better diagnosis of childhood tuberculosis. There is a need for regular training on diagnostic methods and more importantly interpretation of results. In addition, there is a need for health education so address the challenges of community stigma. Also, the study recommends more studies in other counties to inform a national strategy for effective diagnosis of childhood TB.

KEYWORDS : Children; Diagnosis; Healthcare; Tuberculosis

Introduction

Tuberculosis (TB) is among the top 10 cases of death among children worldwide; however, children with TB are given low priority in most national health programs and are neglected in this epidemic (Marais, BJ, et al, 2001). In 2015, The World Health Organization (WHO) estimated that 1 million children suffer from TB worldwide (<15 years), and that more than 136,000 die each year (Theart et., al 2005). However, many people believe that these numbers underestimate the true extent of the problem. Other studies have shown that 70-80 % of children with TB have the disease in their lungs (pulmonary TB) the rest are affected by TB disease in other parts of their body (extra pulmonary TB). (Khan et al., 1995) Transmission within a community as measured by the annual risk of infection (ARI) varies with age. The risk is highest in young children in the first year of life at 43%, falling to 24 % between 1-5 years of age and gradually dropping to adult levels at adolescence an adult has a 15 % life time risk of developing TB (Moore et al., 2009). The incidence of TB has gone up over the last decade largely being fuelled by the HIV pandemic. Nearly half of patients with TB are HIV co-infected (Marais, BJ, et al, 2001) Tuberculosis (TB) in children is a serious condition, and in endemic regions TB is a likely cause of death among children with symptoms of respiratory infections (WHO, 2012).

The relative proportion of TB cases occurring in children is found to vary significantly between countries, and children are estimated represent 15-20% of the disease burden in areas where the TB epidemic is poorly controlled (Marais et al., 2010) Although advances have been made in diagnosis for example introduction of gene pert and simplified diagnostic algorithm development in children still lagged behind.

Diagnosing TB in children is complex and challenges come due to inaccessible effective diagnosis tests in poor-resource areas. As a result of inaccessibility, there is late diagnosis that come about after several visits at the health care facilities (Marais et al., 2010). However, with the role out of Gene expert as a first line diagnosis in health facilities in Kenya, the data from the ministry suggest improved diagnosis. For further improvement, there is a need to build human resources capacity. This can only be achieved if their knowledge practices and perception on diagnosis is evaluated. As steps towards achieving this goal, we carried a study to assess the knowledge practices and perception of health care workers in diagnosing childhood tuberculosis

Materials and Methods

This was a cross-sectional study design, where 44 health care workers comprising of 1 medical officer, 13 clinical officers and 30 nurses. The study participants were purposively sampled from TB diagnostic health care facilities at Bureti Sub-county, Kericho County in Kenya. The data collection tools were semi-structured questionnaires and key informant guide targeting health care workers and health facility in charges respectively. Each study participant provided informed consent and the study was approved by Baron University Ethics Committee.

Results

Majority of the respondents (80%) were nurses and (20%) are other cadres. Of the respondents 40.9% were male and 59.1% were females. Majority (65.9%) of the health care workers were from level 4 facilities while 34.1% came from other facilities. Although many respondents (50%) had experience above 5 years of working in TB diagnostic facilities majority (72.7%) have not been trained on TB diagnosis. Of the few (27.3%) who have received training 15.7% focused on both TB diagnosis and infection. Also majority (70%) of respondent have not been trained on childhood TB infection. The study further shows that majority of health facilities (65.9%) had no WHO/National guidelines for TB diagnosis (Table1)

Table 1: Demographic characteristics of the respondents

Parameters	Category	Frequency	Percent
Gender	Male	18	40.9
	Female	26	59.1
Year of experience	Below 1 year	6	13.6
	1-5 years	16	36.4
	Above 5 years	22	50
TB Training	Yes	12	27.2
	No	32	72.7
Focus of the training	TB diagnosis	2	4.6
	TB infection	3	6.8
	TB diagnosis and infection	7	15.9
Presence of WHO/ National guidelines at the facility.	Yes	15	31.4
	No	29	65.9

Table 2. Practices for TB clinical diagnosis

	Yes (%)	No (%)
Is suggestive history clear?	31(70.5)	13(29.5)
Are suggestive signs always clear?	24(54.5)	20(45.5)
Are suggestive radiology features always clear?	13(29.5)	31(70.5)
Is mantoux test reliable?	19(43.2)	25(56.8)
Mantoux test well known to me	16(36.4)	28(63.6)
Complete blood count is reliable	3(6.8)	41(93.2)
Complete blood count interpretation is well known to me	13(29.5)	31(70.5)
Is gene expert available?	30(68.2)	14(31.8)
Is gene expert reliable?	33(75)	11(25)
Gene expert interpretation is well known to me	13(29.5)	31(70.5)
I often use gene expert	9(20.5)	35(79.5)
Sputum test is reliable	6(13.6)	38(86.4)
Sputum collection procedure is well known to me	38(86.4)	6(13.6)

Majority (68.7%) are aware that gene pert machine is available with most (70.5%) of the staff don't know how to interpret gene expert results as shown in the table above.

Table 3. Health care worker's perception on TB

	Yes (%)	No (%)
Childhood TB is rare in Bureti	16(36.4)	28(63.6)
Diagnosis is only done by experts	5(11.4)	39(88.6)
Always investigate HIV in suggestive TB children	44(100)	0 (0)
Always investigate TB in suggestive HIV children	44(100)	0 (0)

Minority of the healthcare workers believe childhood TB in Bureti sub-county is rare (36.4%) and diagnosis is always done by experts (11.4%). Few study participants (36.4) agree that health facilities are well equipped to diagnose TB with minority of the key informant 40% agree that facility are well equipped to diagnose TB.

Despite childhood TB being a major public health problem (81.8%), community members have stigma towards TB (61.4%) with majority of key informants (80%) fear to diagnose with TB because it is associated with HIV disease.

Discussion.

It was noted that most (86.4%) of the participants had experience beyond 1 year, however, majority had never been trained on TB. Concerning health workers knowledge on the causes of TB, we found that all participants knew mycobacterium tuberculosis as the causative agent of TB. This finding was contrary to a study done by Neeta Singla *et al* (1998) which showed considerable number of nurses (56.5%) working in general hospital knew TB is caused by Bacteria. The disparity on the awareness could be because health workers our target group was specific to TB clinics. Nonetheless, the indication by some (31.8%) in our study that mycobacterium *leprae* also caused TB illustrate a gap in knowledge or misconception which is critical especially for health workers with the majority of the key informants 70% of the staff are not trained on paediatric TB. This knowledge gap is informative of important training programmes necessary to effectively understand TB (Hashim *et al*, 2003).

The outcome of TB treatment was well known to all health care workers and this was consistent with others studies of health workers in Tanzania and India who demonstrated high knowledge on childhood TB (Kavita and Gawde, 2015; Adams *et al*, 2014). Majority (79.5%) of the respondents believed that there is an effective vaccine for treating TB. High knowledge (95.5%) on the clinical forms of TB was demonstrated by the health care workers, however, they were all able to mention only lungs, meninges and lymph nodes as human organs affected by TB but some of the respondents mentioned skin, peritoneum, bladder and kidney as other organs of the body affected by TB. With regards to compliance to treatment more than half (68.2%) said it was easy to achieve and majority (79.5%) agreed that a health care worker was designated to follow up a TB client. The respondents were concerned with the effects of treatment duration on compliance. Directly Observed Treatment (DOT) is important in TB control and the overwhelming agreement (77.3%) by our respondents that they had the skill to administer it was encouraging. Moreover previous training on

TB was found to have had significant association with gained skills on DOT administration. Similar association on previous TB training was observed on the knowledge of TB treatment duration compliance. This implied TB training does impart necessary knowledge and skills to its participants hence support TB control and prevention

Majority of the respondents (61.4 %) believe stigma still remain a challenge in diagnosis of TB especially to both health care workers and the community at large which concur with Somma. D *et al* (2008), the level of stigma is a barometer indicating the success of TB diagnosis due to the association with HIV/AIDS which discourages people from health seeking behavior.

Research proved, early diagnosis of TB has essential component for treatment and reduction of community transmission (Hashim *et al*, 2003). Our study found significant numbers of respondents (70.5%) found suggestive history of TB clear during diagnosis and many (86.4%) had no problem undertaking sputum collection procedure. The finding agreed with Jain *et al* (2012) who reported (82.4%) of providers asked for sputum microscopy in suspected case of cough of more than two weeks. However, Chakaya *et al* (2005) found that 45.1% of private health care providers used sputum examination for diagnosis. Gene Xpert was found to be pretty available within TB clinics and many (75%) health workers agreed on its reliability on TB diagnosis; but surprisingly, few (20%) of them used it. This could suggest lack of essential training on gene Xpert to enhance its adoption in TB diagnosis and challenges in sputum referral and delay in relaying results to the health facility, the finding concurs with Piatek *et al* (2015) study in Mozambique who found low adoption of Xpert technology in TB diagnosis. Many (84.1%) clinicians prefer chest X ray in their diagnosis, this trend could be due easy to request, instant results and the good understanding by the health workers in addition to the X ray availability in the facilities.

In Kenya national guidelines are available (NLTP 2014) but as per the research majority 65% of facilities don't have access to the national paediatric TB guidelines which is contrary to study on policy, practice and evidence Madhukar P. *et al* (2010) there have been several new policies and guidelines on TB diagnostics. However, there are major gaps in implementing in the existing pipeline, therefore there is need to avail the guideline on the group so that implementation process is done.

In summary, there is low level of knowledge and practice of the health care providers regarding diagnosis and treatment of paediatric TB, reflecting the clearly need for urgent regular TB related training and mentorship

Conclusions

There is a need for improved knowledge, practices and perception among health care workers on the diagnosis of childhood tuberculosis. Regular seminars, symposiums or meetings should be carried out to overcome these deficiencies. Also, this kind of study should be carried out in other counties so that the several findings can inform a national strategy of capacity building of health care workers.

Conflict of Interest: None declared

Source of Support: Nil

Ethical Permission: Obtained

REFERENCES

- Abubakar J, Landy M, Frne CE, Shingandia D. (2008) Epidemiology and treatment outcome of childhood tuberculosis in England and Wales 1999-2006. Arch Dis Child; 144-148.
- Adams LV, Olotu R, Talbot EA *et al*. (2014) Ending neglect: providing effective childhood tuberculosis training for health care workers in Tanzania. Public Health Action; 4: 233-7
- Akhila, K, Mahideran, S, Adhivisan, B. (2007). Quantitative evaluation of tuberculin test response in childhood tuberculosis. India J Paediatr, 74 (7):641-4
- Amdekar, Y. (2004). Consensus statement of IAP working group: Status report on diagnosis of childhood tuberculosis. India Paediatrics; 41:146-55
- Ann, M. Loeffler. (2003). Paediatric Tuberculosis. Seminars in Respiratory Infections, Vol 18, No 4, 272-291. Ann Paediatr (Bare), 66 (3): 248-53.
- Baez C. (2005). Tuberculosis children. Http. www. utc. ac. za accessed.
- Bianchi L, Galli L, Moriondo M (2009) *et al*. Interferon- γ Release assay Improves the diagnosis of tuberculosis in children. Paediatr Infect Dis J, 28: 510-14
- Bloch, AB, Snider, DE. (1986). How much tuberculosis in children must we accept? Am J Pub Brent, AJ. Anderson, ST. Kampmann, B. (2008) Childhood tuberculosis: out of sight out of mind? anti-tuberculosis therapy. Clin Infect Dis, 2004, 38(5): 754-6
- Chakaya, J.M, Meme H, D. Kwamanga, *et al*. (2005) Planning for PPM-DOTS implementation in urban slums in Kenya: knowledge, attitude and practices of private health care providers in Kibera slum, Nairobi. The International Journal of Tuberculosis and Lung Disease 9(4):403-408
- Chintu, C, Bhat, G. *et al*. (2003) Seroprevalence of Human immunodeficiency Virus

- type infection in Zambian children with tuberculosis. *Paediatr Infect Dis J* ; 12:499-504
11. Coditz, GA, Brewer, TF, Berkley, CS. (1994). Efficacy of BCG vaccine in the Prevention of tuberculosis: Meta-analysis of the published literature. *JAMA*; 271:698-702.
 12. Coovadia, HM, Jeena, P, Wilkinson, D. (1999). Childhood HIV and TB co-infections: reconciling conflicting data *Int J Tuberc Lung Dis* . 3 (12): 1144
 13. Corbett, EL, Watt, CJ, Walker, N, Maher D, Williams BG, Raviglione. MC, Dye, C. (2003): The growing burden of tuberculosis: global trends and interactions with the HIV epidemic. *Arch Intern Med*, 163(9):1009-1021
 14. Coulter J.B. (2008) Diagnosis of pulmonary tuberculosis in young children (review). *Ann Trop Paediatr* , 28(1): 3-12
 15. Datta M, Swaminathan M. (2001). Global aspects of tuberculosis in children. *Paediatr Resp*
 16. Donald PR. (2002) Childhood tuberculosis: out of control? *Curr Opin Pulm Med*; 8(3): 178-82
 17. E.Khan, J, starke (1995), Diagnosis of tuberculosis in children; increased need for better methods *emerg Infect Dis*, 1pp.115-123.
 18. Engohen M, Toung M. (2006) Epidemiology of childhood tuberculosis in Libreville, Gabon from 1997-2001. *Med Trop (Mars)*, 66(5): 469-71.
 19. Ferrara G, Losi M, Damico R (2008). Use in commercial routine practice of two commercial
 20. blood tests for diagnosis of infection with *Mycobacterium tuberculosis*ss.: a prospective study. *Lancet* 367, 1328-34
 21. Gennaro, M.L. (2000), Immunologic diagnosis of tuberculosis. *Clin Infect Dis*; 30 (suppl 3)s243-46
 22. Gie, RP, Beyers, N, et a (1995). TB or not TB? An evaluation of children with an incorrect initial diagnosis of pulmonary tuberculosis. *S Afr Med J*; 5:658-62.
 23. Gordis L (2004). *Epidemiology*. In Elsevier. Eds
 24. Graham, SM Coulter, JB, Gilks, CF. (2001). Pulmonary disease in HIV infected African children.