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CAUSES OF DELAY IN DIAGNOSIS OF PULMONARY TUBERCULOSIS IN PATIENTS ATTENDING A REFERRAL HOSPITAL IN WESTERN KENYA
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CAUSES OF DELAY IN DIAGNOSIS OF PULMONARY TUBERCULOSIS IN PATIENTS ATTENDING A REFERRAL HOSPITAL IN WESTERN KENYA

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ABSTRACT

Objective: **To determine the length of delays from onset of symptoms to initiation of treatment of pulmonary tuberculosis (PTB).**
Design: **Cross-sectional study.**
Setting: **Chest/TB clinic, Moi Teaching and Referral Hospital (MTRH), Eldoret, Kenya.**
Subjects: **Newly diagnosed smear positive pulmonary tuberculosis (PTB) patients.**
Results: **Two hundred and thirty patients aged between 12 and 80 (median; 28.5) years were included in the study. They comprised 148 (64.3%, median 30 years) males and 82 (35.7%, median 28 years) females. One hundred and two (44%) came from urban and 128 (56%) came from rural setting covering a median distance of 10 (range 0–100) kilometres and paying Kshs 20 (range 0–200) to facility. Cough was the commonest symptom reported by 228 (99.1%) of the patients followed by chest pain in 214 (80%). The mean patient delay was 11 ± 17 weeks (range: 1–78 weeks) with no significant difference between males and females, the mean system delay was 3 ± 5 weeks (range: 0-39 weeks). The median patient, health systems and total delays were 42, 2, and 44 days respectively for all the patients. Marital status, being knowledgeable about TB, distance to clinic and where help is sought first had significant effect on patient delay.**
Conclusion: **Patient delay is the major contributor to delay in diagnosis and initiation of treatment of PTB among our patients. Therefore TB control programmes in this region must emphasise patient education regarding symptoms of tuberculosis and timely health seeking behaviour.**

INTRODUCTION

The key elements in any TB control programme are early diagnosis and prompt initiation of effective therapy. Delays in diagnosis result in an increased period of infectivity in the community. It has been estimated that untreated smear positive patient infects on average more than ten contacts per year (1). Delay in diagnosis also causes disease to advance resulting in more morbidity, complications and mortality. Worse still, for those patients co-infected with HIV-1, *Mycobacterium tuberculosis* (MTB) causes increase in viral load (2,3) making them more likely to transmit HIV-1 as well as have rapidly progressing immune suppression. Therefore, delay in diagnosis of TB impact negatively in the control of both TB and HIV.

Studies have shown that patient and health care delays vary in different communities over the world. Surveillance data collected between 1999

and 2000 in London showed a median total delay of seven weeks (4), whereas Farah *et al* (5) found a total delay of nine weeks among 83 Norwegians. In Iran, Masjedi *et al* (6) studied 50 newly diagnosed PTB patients and found a total delay of 15 weeks. Similar trends have been found in studies conducted in Africa where total delays of 12, 11.4 and 10 weeks have been reported in studies from Uganda, Ethiopia and Nigeria respectively (7-9).

Delay is divided into three components namely, patient delay, health system delay and total delay. However, there is no universally accepted period for total delay (10,11). Published studies on delay from Kenya are very scanty. The purpose of our study was to describe time intervals between onset of symptoms and start of treatment among smear positive PTB patients attending Moi Teaching and Referral Hospital (MTRH) in Eldoret, western Kenya region.

MATERIALS AND METHODS

Study setting: This study was carried out at the Chest/TB clinic of MTRH. The clinic is open on all days of the week run by clinical officers trained in TB care and one nurse supervised by a consultant who sits in the clinic one day a week. The patients attended to are normally walk-ins or referrals from practitioners within or outside MTRH. TB diagnosis and management are done according to the national protocols; diagnosis by sputum examination and chest X-rays with tissue biopsies and cultures depending on the site of TB disease. The standard treatment regimen (2RHZE/6EH) DOTS is used as first line. Approximately 100 to 150 patients are seen in the clinic every month.

Ethical considerations: Consent to carry out the study was sought and obtained from MTRH/MUSOM Institutional Research and Ethics Committee (IREC).

Design: This was a cross-sectional descriptive study based on patient records and interviews at the MTRH chest/TB clinic. Data were collected between January 2002 and December 2004.

Data collection: Details about age, gender, presenting symptoms, timing of first symptom and first visit to the health care provider (facility) were noted. Dates of sputum examination and initiation of treatment were recorded. The time of first symptom of disease was estimated from the patients history as recorded in the charts or during interview. The date of treatment initiation was noted from the charts. An assistant was trained to interview patients and extract the relevant information from the patient's notes into a form.

Patients: Patients for the study were selected from among those attending the chest/TB clinic. Newly diagnosed smear positive PTB patients were included if they gave consent. Smear positive patients were chosen because they are the primary source of disease transmission.

Delays in TB diagnosis and treatment are commonly divided into two sub-categories; patients delay and health services systems delay. We defined delay as follows:

(i) Patient's delay — the time in weeks from first symptom of disease to first consultation with a health care provider.
(ii) Systems delay — time in weeks from the first consultation to initiation of treatment.
iii) The sum of these two is the total delay.

Statistical analysis: Epi Info version 6 was used for data entry and cleaning. Data were analysed using SAS Institute version 9. Groups were described by age, gender and other socio-demographic variables. Descriptive statistics were used to describe the continuous variables while frequency listings were used for the categorical variables.

RESULTS

Two hundred and thirty patients were included in the study. They comprised 148 (64.3% mean age 31.5 ± 11.4, median 30 years) males and 82 (35.7%. mean age 32.2 ± 13.2, median 28 years) females. All patients were aged between 12 and 80 (median; 28.5, mean; 31.8 ± 12) years. One hundred and two (44%) came from urban and 128 (56%) came from rural setting covering a median distance of 10 (range 0–100) kilometres and paying KES 20 (range 0–200) to facility. Socio-demographic characteristics are shown in Table 1.

Most patients came to the health facility with combination of symptoms, the most frequent being

cough reported by 228 (99.1%) of patients followed by chest pain in 214 (80%) patients. Presenting symptoms are summarised in Table 2.

The mean patient delay was 11 ± 17 weeks (range: 1–78 weeks) with no significant difference between males and females. Marital status (p=0.015) being knowledgeable about TB (p = 0.015), distance to clinic (p=0.04) and where help is sought first p<0.0001) had significant effect on patient delay. While the mean system delay from presentation to treatment was 3 ± 5 weeks (range: 0-39 weeks). The median patient, health systems and total delays for all the patients were 42, 2, and 44 days respectively (Table 3).

Table 1

Socio-demographic characteristics of the 230 patients

Characteristic	Males (n = 148)		Females (n = 82)		All (n = 230)	
	No.	(%)	No.	(%)	No.	(%)
Age in years						
<24	39	26.35	26	31.71	65	28.26
25-44	91	61.49	41	50.00	132	57.39
45+	18	12.16	15	18.29	33	14.35
Marital status						
Married	89	60.14	39	47.56	128	55.6
Single	41	27.70	27	32.93	68	29.6
Widowed/separated/divorced	18	12.16	16	19.51	34	9.6
Level of education						
None	8	5.41	3	3.66	11	4.8
Primary	40	27.03	34	41.46	74	32.1
Secondary and above	100	67.57	45	54.88	145	63.1
Employment status						
Casual	16	10.81	3	3.70	19	8.3
Salaried	46	31.08	10	12.35	56	24.5
Self	37	25.00	15	18.52	52	22.7
Unemployed	49	33.11	53	65.44	102	44.5
Estimated household income (KES)						
<3,001	31	20.95	12	14.63	43	18.7
3,001–6,000	38	25.68	33	40.24	71	30.9
6,001–9,000	44	29.73	22	26.83	66	28.7
>9,000	35	23.65	15	18.29	50	21.7
Distance to facility (km)						
0–10	76	51.35	43	52.44	119	51.74
11–20	31	20.95	14	17.07	45	19.57
21–30	22	14.86	18	21.95	40	17.39
>30	19	12.84	7	8.54	26	11.30
Fare to facility (KES)						
0–20	84	56.76	44	53.66	128	55.65
21–40	21	14.19	12	14.63	33	14.35
41–60	26	17.57	21	25.61	47	20.43
>60	17	11.49	5	6.10	22	9.57
Household size (persons)						
1–3	46	31.08	22	10.98	68	15.22
4–6	64	43.24	43	52.44	107	46.52
>6	38	25.68	17	36.59	33	38.26
Number of rooms						
1-3	120	81.08	72	87.80	192	83.48
>3	28	18.92	10	12.20	38	16.52
Residence						
Urban	63	42.6	39	47.6	102	44.3
Rural	85	57.4	43	52.4	128	55.7
Christian religion	143	96.6	78	95.12	221	96.09
Ever smoked	61	41.22	6	7.32	67	29.1
Drink alcohol	76	51.35	7	8.54	83	36.1

Table 2

Presenting symptoms in the 230 patients

Symptom/sign	Males		Females		No.	(%)
	No.	(%)	No.	(%)		
Breathlessness	15	10.14	13	15.85	28	12.2
Cough	146	98.65	82	100	228	99.1
Haemoptysis	9	6.08	7	8.54	16	6.96
Chest pain	118	79.73	66	80.49	184	80.0
Fever	41	27.70	18	21.95	59	25.6
Night sweats	64	43.24	30	36.59	94	40.9

Table 3

Patient characteristics for patient health care system and total delays. [Marital status; widowed, separated or divorced (p = 0.015), being less knowledgeable about TB (p=0.015), distance to clinic; more than 10 km (p=0.04) and had significant effect of prolonging patient delay] (n = 230)

Characteristic	No.	Median delay (range) in days	
		Patient	System
Sex			
Males	148	5	1
Females	82	6	1
Age in years			
<24	65	6	1
25-44	132	5	1
45+	33	8	1
Marital status			
Married	128	5	1
Single	68	5	1
Widowed/separated/divorced	34	10	1
Level of education			
None	11	6	3
Primary	74	7	1
Secondary and above	145	5	1
Employment status			
Casual	19	7	1
Salaried	56	5	1
Self	52	6	1
Unemployed	102	6	1
Household income (KES)			
<3,001	43	8	3
3,001–6,000	71	5	1
6,001–9,000	66	5	1
>9,000	50	6	2
Distance to facility (km)			
0–10	119	5	1
11–20	45	6	1
21—30	40	6	1
>30	26	10	1
Fare to facility (KES)			
0–20	128	5	1
21–40	33	6	1
41–60	47	6	1
>60	22	8	1
Household size (persons)			
1–3	68	6	1
4–6	107	5	1
>6	55	6.5	3
Number of rooms			
1-3	192	5	1
>3	37	8	1
Residence			
Urban	102	6	1
Rural	128	5	1
Christian religion	221	6	1
Ever smoked	67	6	1
Drink alcohol	83	6	1

DISCUSSION

This study shows that a substantial part (95%) of the total delay of 6.3 weeks is contributed to by patient delay. Therefore any intervention to control tuberculosis among our patients should be aimed at reducing patient delay. Median patient delay of six weeks in our study falls within what other workers across the world have reported, longer than two weeks reported by Yimmer *et al* (8) among Ethiopians, four weeks in Norway (5) and 2.5 weeks in Thailand (12), but shorter than 8.5 weeks reported by Demisse *et al* (13) also among Ethiopians and eight weeks among Nigerians (9). In our study age older than 45 years and having low household income were significantly associated with patient delay longer than the median for the whole group whereas, marital, being knowledgeable about TB, distance to clinic and where help is sought first had significant effect on patient delay. Our study replicates the finding of Demisse *et al* (13) and Yimmer *et al* (8) who reported that those who stay far from facility take long to present. It is logical that with rampant poverty many patients cannot travel to health facility promptly. Lack of awareness of tuberculosis has also been cited as a cause of abnormally long delay by patients (14,15). We did not assess TB awareness but given that most of our patients stay in the rural areas, there is high likelihood that the same applies to our patients. This is an area requiring further exploration and at the same time incorporating TB awareness campaigns in our control programmes.

Health services delay (5% of total median delay) in Kenya as our findings show is approximated by that of Ethiopia where Demisse *et al* (13) in a cross sectional study involving all public hospitals reported that median system delay contributed only 9% to the median total delay. Our findings are in contrast to those of Kiwuwa *et al* (7) in Uganda where health services delay contributed substantially (74%) to the total median delay, a finding that may be a pointer to difference in efficiency of TB services in the two countries as both studies were carried out in referral hospitals. Other reports (13) indicate that systems delay is directly related to distance to facility, however, this cannot explain the difference in Kiwuwa's findings and ours; 88% of our patients came from less than 30km, 85% of Kiwuwa's (7) came from less than 25km.

Most of our patients (64%) presented late, by more than four weeks of onset of symptoms only 7.4% presented within two weeks of symptoms. This offers a challenge in our setting to find out why patients do not report promptly for care. There is need to investigate the effect of severity of symptoms as a cause of prolonged patient delay. Hospitalisation has been found to be associated with shorter patient delay (7) most likely due to the fact that only those with severe symptoms get admitted into hospital. Other findings which have been reported include subsistence farming, education level, alcohol consumption and lack of knowledge of TB. Distance of more than 10 km to facility and visit to non-formal health care providers have been found to be significantly associated with prolonged patient delay (8). We need to probe these factors among our patients in order to provide targeted intervention strategies aimed at reducing patient delay.

The duration of symptoms of pulmonary TB before treatment should be as short as possible to reduce the chances of disease spread in the community. However, the symptoms are initially similar to those of other diseases making the patients and health care providers assume that the symptoms would be simple to treat or resolve spontaneously. Cough was the most frequent symptom seen in 99.1% of our patients, followed by chest pain in 80%. These findings mirror those of Demissie *et al* (13) who found cough in 95% and chest pain in 78% of their Ethiopian patients. Thus the concept of chronic cough, duration after which pulmonary tuberculosis should be seriously considered in any patient with relevant symptoms should be adhered to by both patients and health care workers. Unfortunately, acceptable or reasonable delay for initiating treatment for pulmonary tuberculosis has not been clearly defined by researchers or policy makers. Consequently, many workers have used median delay among groups of patients as cut off while others use two week cut-off (for chronic cough) in discussing tuberculosis management. Therefore, there is urgent need for a consensus on what duration should be regarded as unacceptable delay.

Our study has potential limitations; the study was carried out in a referral hospital and only patients who presented themselves or those who were referred were included, therefore it would be illogical to generalise the findings to the whole country. Secondly duration of symptoms was self reported even though we confirmed from the patient notes thus lending itself to recall bias.

In conclusion, patient delay is the major contributor to delay in diagnosis and initiation of treatment of PTB among our patients. Therefore TB control programmes in this region must emphasise patient education regarding symptoms of tuberculosis and timely health seeking behaviour. Future research should be directed at finding the reasons for this long delay among our patients to inform health education messages.

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