

Use of Chest Radiography in Patients Suspected of Pulmonary Tuberculosis

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INTRODUCTION

Like most other African countries, Malawi is experiencing an upsurge in reported cases of tuberculosis (TB) largely due to co-incident infection with the human immunodeficiency virus (HIV). Cases of tuberculosis have risen from just over 5000 in 1985 to over 14000 in 1991.

This increase has had an adverse effect on tuberculosis diagnostic and treatment services. The number of smear negative pulmonary TB cases has risen quite dramatically in the last 2 years, and at Queen Elizabeth Central Hospital, Blantyre in 1991, 70% of all diagnosed tuberculosis patients were classified as smear negative PTB. This increase in smear negativity may reflect a true increase in cases in relation to HIV infection, and/or a reflection of technical problems in clinical and laboratory diagnosis. If sputum microscopy laboratories cannot keep up with the greatly increased work load, then smear positive patients may be misdiagnosed as smear negative and given inappropriate treatment. Overworked clinicians on the wards may be rushed into treating all cases of cough, fever and weight loss with negative sputums as PTB, and other diagnoses may be overlooked. A cheaper, quicker way of screening TB suspects would help considerably in this common problem.

In February 1991, the Norwegian Government donated two Odelka cameras to Malawi; one installed at Kamuzu Central Hospital, Lilongwe, and the other at Queen Elizabeth Central Hospital, Blantyre. These cameras are capable of taking high quality miniature chest radiographs quickly and at much lower cost compared with a standard chest x ray films: costing in July 1992 was MK 750 for 100 standard chest x ray films compared with MK 150 for 100 miniature chest x ray films. However, until now a plan has not been developed for the use of these Odelka cameras. It is possible that these units could function to screen TB suspects at both hospitals; this would reduce the burden on microscopy services and possibly increase the speed and accuracy of TB diagnosis.

At present it is not known what proportion of PTB suspects attending OPD have an abnormal radiograph. If the proportion was very low, then it would not be worth considering the use of the Odelka cameras as a screening tool. We therefore carried out a small pilot study to determine the proportion of normal and abnormal radiographs in out-patients presenting to Queen Elizabeth Central Hospital with a suspected diagnosis of PTB.

METHODS AND RESULTS

Standard chest radiography was carried out on adult patients attending OPD II, Queen Elizabeth Central Hospital, who presented with a cough and were suspected on the basis of weight loss to have pulmonary tuberculosis. The first study involved consecutive patients presenting with a cough of more than 3 weeks duration, and the second study involved patients presenting with a cough of 1 - 3 weeks duration. The studies were carried out between April and June 1992. Chest radiographs were read by ADH, and categorised as Normal, Abnormal - probably non tuberculous, Abnormal - probably tuberculous.

Chest radiography was carried out on 64 patients with cough >3 weeks. There were 42 men and 24 women, mean age 35 years. Results are in Table 1. Chest radiography was carried out on 57 patients with cough of 1 - 3 weeks. There were 33 men and 24 women, mean age 32 years. Results are in TABLE 2. In both groups of patients, mean age and sex ratios were similar between different diagnostic x ray categories.

TABLE 1. RADIOGRAPHIC FINDINGS IN PATIENTS WITH COUGH >3 WEEKS.

CATEGORY OF XRAY DIAGNOSIS	NUMBER	(%)
<u>NORMAL:</u>	25	(39)
<u>Abnormal - Probably Non tuberculous:</u>	12	(19)
Pulmonary congestion	3	
Emphysema	1	
Minor infiltrations	8	
<u>Abnormal - Probably Tuberculous:</u>	27	(42)
Hilar Lymphadenopathy	3	
Pleural effusion	2	
Cavitations	3	
Infiltrations and mediastinal lymphadenopathy	2	
Infiltrations with /without consolidation	17	

TABLE 2. RADIOGRAPHIC FINDINGS IN PATIENTS WITH COUGH 1-3 WEEKS.

CATEGORY OF XRAY DIAGNOSIS	NUMBER	(%)
<u>Normal:</u>	31	(54)
<u>Abnormal - Probably Non- Tuberculous:</u>	10	(18)
Pulmonary congestion	4	
Emphysema	1	
Cardiomegaly	1	
Minor infiltrations	4	
<u>Abnormal - Probably Tuberculous:</u>	16	(28)
Hilar Lymphadenopathy	1	
Pleural effusion	1	
Miliary shadowing	1	
Cavitations	1	
Infiltrations with mediastinal lymphadenopathy	4	
Infiltrations with/without consolidation	8	

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DISCUSSION

Results show that in patients with suspected tuberculosis (on the basis of cough and weight loss), 42% of those with a cough >3 weeks and 28% of those with a cough of 1 - 3 weeks had radiographic changes compatible with a diagnosis of tuberculosis. Furthermore, almost 20% of patients in each group had other radiographic changes (pulmonary congestion, minor infiltrations compatible with lower respiratory tract infection), knowledge of which would have been helpful in planning appropriate therapy.

We expect that this small study has its limitations. There is interobserver variation in interpreting chest x rays and the sensitivity and specificity of the radiographic diagnosis of tuberculosis is not 100%, particularly when trying to assess pulmonary infiltrates. However, on the basis of the clinical features and the radiographic abnormalities categorised as "probable tuberculous", these patients would very likely have been started on anti-tuberculous chemotherapy even if sputums had been negative.

We feel that as a result of this study it is worthwhile carrying out a more definitive assessment of

the value of Odelka cameras in screening suspect PTB patients, particularly those with a cough >3 weeks. This will have to be done in conjunction with (i) sputum smear and possibly sputum culture examination and (ii) the response of the patient to anti-tuberculous chemotherapy. Only by comparing the radiographic abnormalities against these other yardsticks of TB diagnosis will we be able to assess the sensitivity and specificity of miniature radiography.

ACKNOWLEDGEMENT

We would like to thank most sincerely the following staff in OPD II who ordered the chest x rays and filled in the forms: Mr J Vintula, Chief Clinical Officer; Mr J G Chinula, Senior Clinical Officer, Mr A S Chiluzi, Clinical Officer and Mr K M Njawala, Senior Medical Assistant. We would also like to thank Dr R O'Brien and Dr K Styblo from the World Health Organization for encouraging us to carry out this study.

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