COST AND BENEFITS OF CHEST RADIOGRAPHY FOR ROUTINE MEDICAL EXAMINATIONS

A STUDY BASED ON 2,500 CASES

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SUMMARY

Chest radiographs requested over a period of one year for purposes of medical examinations at the Korle Bu Teaching Hospital for pre-employment and routine check up for those already in employment were assessed. This paper was concerned with those in the latter group. The review involved 2,500 chest radiographs of personnel from the petroleum, tobacco, cement and building industries and some clerical workers. There were 100 cases of abnormal chest radiographs. 98 of the abnormal cases did not pose any serious threat either to themselves, co-workers or families, but the remaining 2 cases did have active pulmonary tuberculosis. The radiological cost in terms of films, chemicals, manpower etc. of identifying these 2 patients in the series was thirty six million Cedis (£36,000,000.00).

Key words: Pulmonary, radiograph, mediastinum, Sarcoidosis

INTRODUCTION

According to World Health Organization (WHO)\(^1\) and International Labour Organization (ILO)\(^2\) regulations, certain diseases have been classified as occupational related and that workers in Coal mines and asbestos industries, to mention just a few, need to have periodic chest radiographs. There are, however, certain firms/industries which do not fall into the WHO categories but are concerned about the health of their employees and, therefore, have yearly routine medical examinations including chest radiographs. The important question is not "Is routine chest radiography of value in medical check-up", but rather "How often and at what cost?"\(^3\). The answers should allow a more rational use of diagnostic services in clinical management. This paper attempts to answer the question in respect of costs and benefits of chest radiography for medical examinations for those already in employment.

PATIENTS AND METHOD

A total of 2,500 employees of petroleum, tobacco, cement and building industries as well as some clerical workers were sent for chest radiography for their yearly routine medical examinations. This included their top executives and the factory workers.
RESULTS

The results of chest radiographs are given in Tables 1 and 2.

### TABLE 1
CHEST RADIOGRAPHS OF 2,500 EMPLOYEES

<table>
<thead>
<tr>
<th></th>
<th>No. of Patients</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>2,400</td>
<td>96.0</td>
</tr>
<tr>
<td>Abnormal</td>
<td>100</td>
<td>4.0</td>
</tr>
</tbody>
</table>

### TABLE 2
ABNORMAL CHEST RADIOGRAPHS OF 100 EMPLOYEES

<table>
<thead>
<tr>
<th>Site of Lesion</th>
<th>No. of Patients</th>
<th>Percentage(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lungs</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>Heart</td>
<td>80</td>
<td>80.0</td>
</tr>
<tr>
<td>Pleural</td>
<td>5</td>
<td>5.0</td>
</tr>
<tr>
<td>Mediastinum</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Thoracic Cage</td>
<td>4</td>
<td>4.0</td>
</tr>
</tbody>
</table>

There were 2,400 normal and 100 abnormal chest radiographs (Table 1). Of the 100 abnormal chest radiographs (Table 2), 10 had lung lesions with focal fibrosis and calcification from old tuberculosis occurring in 8 patients, while 2 patients did have active pulmonary tuberculosis. Cardiac enlargement was observed in 80 patients, mostly from hypertensive heart disease, these were known to be on various anti-hypertensive medication, except 3 whose cause of cardiomegaly was unknown.

5 patients had pleural thickening from obviously previous pleurisy and there was one case of bilateral lobulated hilar glandular enlargement from sarcoidosis. 4 patients had rib abnormalities from previous rib fractures.

DISCUSSION

Chest radiography constitutes the commonest radiological examination requested every year in
radiological departments (Korle Bu Teaching Hospital - 55%; 37 Military Hospital - 59%; Nantuo Clinic - 58.5%). The indications for chest radiographs are usually: those with chest symptoms and signs, medical examinations for pre-employment, visas for travelling abroad and the third group are those who are already in certain identifiable employments in which case it is mandatory to have routine chest radiographs.

However, there are certain firms or industries which do not fall into the WHO and ILO categories but do have routine medical examinations for their staff (which is a good idea) including chest radiographs. In the series, (Table 1) 96.0% of the employees have normal chest radiographs. Of the 100 abnormal cases, only 2 had infectious diseases with active pulmonary tuberculosis. In other words only 2 cases out the 2,500 did pose health hazards to themselves, co-workers and families.

It is important to recognise that running radiological services is an expensive business since all the requirements are imported with foreign exchange. These include expensive machines and equipment, films, developing and fixing chemicals, contrast media (dyes), etc. The full cost of single 17" x 14" chest radiograph (with all subsidy withdrawn) is $8,000.00. Hence the total cost of 2,500 chest radiographs in the series is in the region of thirty six million Cedis ($36,000,000.00).

With our present economic situation and limited facilities in our hospitals with problems of insufficient supplies of films, chemical and contrast media, one would like to use these limited resources judiciously. It is my belief that if clinicians take a little time to make good use of the stethoscope and more importantly their clinical judgement, 2,400 employees of these firms would not have been sent for radiographs at all, thereby avoiding spending $36,000,000.00 of the tax payers money just to detect 2 infectious cases in the series.

In conclusion, it is a good idea to have yearly medical examination for employees. All cases examined clinically and found to have chest ailments or doubtful signs of course should have chest radiography as part of the clinical management, but chest radiography should not be made a routine part of the exercise in view of the cost and our limited radiological inputs. The other alternative is that these firms are made to pay the full cost with subsidy withdrawn.

REFERENCES


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