

Chest radiography for general practitioners— a low yield investigation

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SUMMARY. Of 1,163 chest radiographs requested by general practitioners, 67.5 per cent were normal, 21 per cent revealed an apparently relevant lesion, and 11.5 per cent an apparently irrelevant abnormality. The number of referrals for chest radiography should be reduced to cut costs in an expensive specialty.

Introduction

BECAUSE some studies had shown that the results of radiographical investigations of patients referred by general practitioners were comparable with the results for referrals from other sources,¹ it was concluded that open access to radiography departments should be encouraged. However, budget limitations and rising demand² have necessitated audit in radiology.³ Chest radiographs account for one third of all radiological examinations,⁴ and the low yield of abnormal findings has led to proposals for reduced demand.⁵⁻⁸

In an attempt to identify the value of the examination, we investigated the radiological findings in patients referred by general practitioners for chest radiography.

Methods

A total of 1,163 consecutive patients referred by general practitioners for chest radiography were reviewed. All films were reported on by one observer (P.B.G.) and the clinical problem was recorded. Patients were divided into those under 40 and those over 40 years of age, and then subdivided into three groups according to what the radiograph revealed—normal chest, apparently related abnormalities, and apparently unrelated abnormalities. There was then an allocation into symptom groups.

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Results

Symptom groups were combined where numbers were small.

In 369 patients under the age of 40 years (Table 1), 318 (86 per cent) had normal radiographs. Thirty-eight patients (10 per cent) showed an abnormality related to the clinical problem—for example, inflammation in patients who had clinical evidence of infection. Two patients with peripheral lymphadenopathy showed mediastinal gland enlargement. In only one patient was there radiological suspicion of active tuberculosis, later shown to be due to interstitial pneumonitis. Thirteen patients (3.5 per cent) had an unsuspected abnormality: two with sarcoid, five with old tuberculosis, and six with various lesions (for example, bullae).

In 794 patients over 40 years of age (Table 2), 468 (59 per cent) had a normal chest radiograph. Two hundred and six patients (26 per cent) showed a related abnormality, particularly when there was clinical evidence of infection or chronic airways obstructive disease. Sixteen patients showed possible malignancy; the diagnosis was confirmed in nine cases, was incorrect in three (two patients were normal on follow-up, one had pulmonary emboli) and remains unproven in four cases. In seven dyspnoeic patients, left ventricular failure was found rather than bronchitis. The remaining relevant abnormalities covered a wide range of conditions (Table 2). No evidence of malignancy was found in any patient with haemoptysis. Only 5 per cent of chest radiographs were abnormal in investigation of non-specific chest pain, and 9 per cent in non-specific illness. Old tuberculosis accounted for 27.5 per cent of unrelated abnormalities, the others being mainly due to cardiac enlargement (25 patients). Smoking status was recorded in only 2 per cent of patients.

Discussion

A clinically related abnormality was found in 21 per cent of all patients who underwent chest radiography—10.3 per cent of patients under 40 and 25.9 per cent of

Table 1. Radiological findings in 369 patients under 40 years of age. (Percentages in parentheses.)

Symptoms	Number of patients	Normal	Related abnormalities		Unrelated abnormalities	
Infection, cough, bronchitis, dyspnoea, wheeze	178	145(81.5)	29(16.3)	29 inflammation/consolidation	4(2.2)	<ul style="list-style-type: none"> 1 old TB 1 cardiomegaly* 1 bulla* 1 old pleurisy
Haemoptysis	18	14(77.7)	2(11.1)	2 consolidation	2(11.1)	2 old TB
Hypertension/ cardiac disorders	13	11(84.6)	-	-	2(15.4)	1 sarcoidosis
Non-specific chest pain (no injury)	74	71(96.0)	1(1.4)	pleural reaction	2(2.7)	1 sarcoidosis
Non-specific illness	27	25(92.6)	1(3.7)	? pericarditis	1(3.7)	
Miscellaneous	36	30(83.3)	4(11.1)	<ul style="list-style-type: none"> 1 cervical rib 2 mediastinal lymphadenopathy 1 rib fracture 	2(5.6)	2 old TB
Old TB/TB contact	23	22(95.7)	1(4.3)	old TB	-	
Total	369	318(86.2)	38(10.3)		13(3.5)	

*Presented with cough.

those over 40 years of age. These figures are slightly lower than in some previously reported studies.^{9,10} This study suggests a limited role for chest radiography in patients under the age of 40 years, when there are fewer abnormalities and an absence of tuberculosis. Of the unrelated abnormalities in this age group, in only two cases of sarcoidosis was it likely that radiology would have had an effect on management. The radiographs of patients aged over 40 years also showed a high percentage of normal chests (59 per cent). Among the abnormalities considered relevant there was a wider range of findings, including left ventricular failure, and cardiomegaly which was due to hypertension or chronic obstructive airways disease (COAD). Although included as relevant, some primary and secondary neoplasms were so small that their relationship to symptoms was questionable, and most radiological carcinomas were apparently clinically unsuspected. It is still debatable that the early detection of bronchial carcinoma improves prognosis,^{11,12} and if suspicion of a carcinoma was the reason for referral it is interesting that in only 2 per cent of patients was smoking history recorded. In older patients, the radiological findings in chronic obstructive airways disease, acute infection, and hypertension all appeared to correlate well with the clinical diagnosis making the value of the radiograph questionable. In cases of hypertension and heart failure, the detection of cardiac enlargement or left-sided heart

failure might be expected, and a chest radiograph would appear to have only a baseline function.

In both age groups, haemoptysis proved not to be a sinister symptom, being usually due to infection, although it was surprising that haemoptysis was not recorded on the request card in any case of radiologically suspected carcinoma. Also in both age groups the chest radiographs appeared to be particularly unhelpful in non-specific chest pain (even hiatus hernia could be coincidental) and in non-specific illness without chest symptoms or signs.

Our analysis is based on request card information, and it is possible that not all relevant details were included. Doubilet and Herman¹³ concluded that a suggestive history increased the sensitivity and decreased the specificity of the radiological report. Any request for chest radiography should therefore give full clinical details, and the use of the word 'routine' should now be abandoned.

No attempt has been made in this study to evaluate the negative report. Although never stated, we suspect that reassurance of the patient was the reason for some referrals.

With a high proportion of chest radiographs which are either normal or in which the findings correlate closely with the clinical diagnosis, there must be some potential for reduction in demand—and resultant cash savings.

Table 2. Radiological findings in 794 patients over 40 years of age. (Percentages in parentheses.)

Symptoms	Number of patients	Normal	Related abnormalities	Unrelated abnormalities
Infection, cough, bronchitis/emphysema, dyspnoea, wheeze	448	239(54.0)	145(31.8) { 65 infection 43 COAD 8 ? carcinoma 8 atelectasis 7 LVF 5 cardiomegaly 3 pleural fluid 2 lung deposits 1 fracture 1 ? mesothelioma 1 ? TB 1 bronchiectasis	64(14.2) { including: 20 old TB 16 cardiomegaly 2 goitre 1 hiatus hernia 1 bone deposits
Haemoptysis	27	11(40.7)	8(29.6) { 7 inflammation/consolidation 1 LVF	8(29.6) { including: 3 pulmonary fibrosis 3 asbestos exposure
Hypertension and cardiac disorders	75	44(57.9)	26(34.2) { 21 cardiomegaly 5 cardiac failure	5(7.9) including: 5 old TB
Non-specific chest pain (no injury)	111	87(78.3)	6(5.4) { 2 hiatus hernia 2 ? carcinoma 1 rib deposits 1 lung deposits	18(16.2) { including: 3 old TB 7 cardiomegaly
Non-specific illness	26	22(84.6)	3(11.5) { 1 mediastinal lymphadenopathy 1 cardiomegaly 1 infection	1(3.8) COAD
Miscellaneous	86	56(65.1)	9(10.5) { 4 rib fractures 2 asbestos exposure 1 cardiomegaly 1 ? sarcoid 1 ? carcinoma	21(24.4) including: 5 old TB
Old TB/TB contact	21	9(42.9)	9(42.9) All old TB	3(14.3) { 2 cardiomegaly 1 old pleurisy
Total	794	468(58.9)	206(25.9)	120(15.1)

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