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Pleural effusion in Iraq: a prospective study of 100 cases

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Pleural effusion is a common condition encountered by both chest physicians and chest surgeons in Iraq, and diagnosis of the cause is often difficult. The relative frequency of causes of pleural effusion are known to vary in different parts of the world.¹⁻³ This prompted us to study the causes of pleural effusion in Iraq, and also to evaluate the laboratory methods currently being used in our hospital for the diagnosis of this condition.

Methods

This study was based on a prospective survey of 100 consecutive patients presenting with pleural effusion who were admitted to a general medical ward from January 1982 to February 1985. Sixty three were male and 37 female. Their ages ranged from 14 to 80 years (mean 38.5 years). A clinical history was obtained and a physical examination carried out on every patient. A chest radiograph was obtained and sputum when present was examined for the presence of acid fast bacilli and subjected to cytological examination. Pleural fluid was aspirated and its appearance noted. Protein and glucose content were measured, white blood cell and differential counts were obtained, and the fluid was subjected to cytological examination.

Table 1 *Causes of pleural effusion in 100 cases*

<i>Cause</i>	<i>No of patients</i>
Tuberculosis	38
Malignancy	
Bronchial carcinoma	15
Metastatic carcinoma (breast, cervix, stomach)	11
Lymphoma	5
Mesothelioma	1
Myeloma	1
Ewing's tumour (of the rib)	1
Other infective conditions	
Postpneumonic	2
Pleural hydatid disease	1
Liver abscess	1
? Viral	1
Other non-infective conditions	
Liver cirrhosis	4
Heart failure	5
Pulmonary infarction	2
Chronic renal failure	3
Systemic lupus erythematosus	2
Nephrotic syndrome	1
Unknown cause	6
Total	100

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Table 2 *Results of pleural biopsy in 38 cases of tuberculous and 34 of malignant effusion*

<i>Eventual diagnosis</i>	<i>Result</i>	<i>No of cases (%)</i>
Tuberculosis	Diagnostic	18 (47)
	Non-diagnostic	17 (45)
	Unsuccessful	3 (8)
Malignancy	Diagnostic	14 (61)
	Non-diagnostic	9 (39)
	Not done	11

Pleural biopsy was carried out with Abram's needle, one attempt being made in most cases. A tuberculin test was carried out with 0.1 ml (2 TU) of PPD and the result was considered positive when after 72 hours 10 mm of induration or more was seen. Bronchoscopy was performed when it was thought to be indicated. Other haematological, biochemical, and serological tests were undertaken when they were considered necessary, and in some patients lymph node biopsy was performed.

Results

The most frequent cause of pleural effusion was tuberculosis, which occurred in 38 patients, of whom 30 were adolescents or young adults. Malignant disease accounted for 34 cases (table 1). In six patients no cause for the pleural effusion was found. The most common symptoms were dyspnoea in 87% and cough in 86%; fever was present in 79% and chest pain in 67%. Twelve of the 38 patients with tuberculosis produced sputum; in only one case was the sputum positive for acid fast bacilli on direct examination. Cytological examination of the sputum showed malignant cells in eight of 19 patients with malignant disease who produced sputum. The pleural fluid appeared straw coloured in 34 (90%) of the tuberculous effusions and haemorrhagic in 25 (73%) of the malignant cases. The pleural fluid was an exudate in the great majority of tuberculous and malignant cases and also in cases associated with pneumonia, pulmonary infarction, systemic lupus erythematosus, and hydatid disease. It was transudate when it was part of a generalised accumulation of fluid in the body. The concentration of glucose in the pleural fluid in 30 of the 36 tuberculous cases in which it was examined was over 60 mg/100 ml (> 3.33 mmol/l), while in six it was 60 mg/100 ml or less. In 20 of the effusions due to bronchial or metastatic carcinoma the glucose concentration ranged from 65 to 185 mg/100 ml (3.61-10.27 mmol/l), while in six it ranged from 25 to 35 mg/100 ml (1.38-1.94 mmol/l). In both tuberculous and malignant effusions the cellular content of the fluid was predominantly lymphocytic (80-100% of the total leucocyte count). In malignant cases

the fluid was positive for malignant cells in 15 (60%) out of 25 patients. The results of pleural biopsy are shown in table 2.

Discussion

This study indicates clearly that tuberculosis is still the most common single cause of pleural effusion in Iraq. Cancer is, however, becoming more common as a cause than it was a decade ago.⁴ The relative frequency of the two most common causes of pleural effusion, tuberculosis and cancer, differs from that found in other countries.¹⁻³ There may be several explanations for this difference, but perhaps the most important is that tuberculosis is still not an uncommon disease in Iraq. In this country tuberculous pleural effusion is mainly a disease of adolescents and young adults. A similar age distribution was found in developed countries 30 or 40 years ago, when tuberculosis was still prevalent there. Apart from the history and the physical findings, we have found that the two most useful diagnostic methods were pleural biopsy as a means of differentiating between tuberculosis and malignancy and cytological examination of fluid as a means of confirming the diagnosis.

In other types of effusion a combination of the clinical features of the accompanying disease and the results of relevant tests were usually adequate to make the diagnosis. Our experience of the value of examination of the biochemical and cellular content of the pleural fluid resembles that reported in other studies.^{1 2 4 5} Cytological examination of the pleural fluid yielded positive results in 15 (60%) out of 25 malignant effusions, which compares well with other studies, where the proportion ranged from 15% to 70%.^{1 2 6-8}

Pleural biopsy was diagnostic in almost 61% of cases of malignant disease; similar studies have produced figures ranging from 29% to 60%.^{1 2 7 8} The diagnostic yield of 47.3% in tuberculous cases was, however, rather low compared with the results of others.^{2 9} The tuberculin test gave a positive result in most patients with tuberculous effusions as

expected. It was also positive, however, in 25% of patients with non-tuberculous effusion, reflecting the high prevalence of tuberculosis in Iraq.

In the patient with pleural effusion due to hydatid disease the pleura was studded with small hydatid cysts, although no cyst could be detected in the lung itself. Ultrasound examination performed before the thoracotomy had shown the presence of multiple liver cysts.

In Iraq, whenever pleural effusion is seen in an adolescent or young adult the most likely cause is tuberculosis. Malignancy, whether pulmonary, metastatic, or of lymphatic origin, may be becoming an increasingly common cause of pleural effusion in this country. Pleural biopsy and cytological examination of the pleural fluid were the most helpful diagnostic investigations available in this study.

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