



An Epidemiological Study of Pleural Effusion Among a Sample of Patients Attending Al-Hussein Teaching Hospital-Iraq

Ali Abd AL-LATIF¹, G. MOHEMMED¹, Maytham Salim AL-NASRAWI^{1,2,*}, Ali Neamah Hasan AL-AARAGI¹

^{1,2} Assist Professor, AL-Furat Al-Awsat Technical University- Iraq

SUMMARY. Pleural effusion is an abnormality that frequently develops from the accumulation of fluids in pleural cavity its caused by a primary or secondary to a variety of disorders such as malignancy, heart failure and other infections. It is concerning a serious common condition encountered by both chest physicians and chest surgeons in Iraq. Therefore, some studies that contribute to understanding the predisposing factors of pleural effusion to help doctors to overcome some of the problems facing them. The objective of the study was to determine the epidemiological characteristics of patients presenting with pleural effusion and ascertain predisposing factors of the disease. A cross-sectional study was conducted among a sample of patients who attending Al-Hussein Teaching Hospital, the study consists of 54 patients suffered from pleural effusion those who diagnosed by specialized doctors from the Hospital lobbies for internal medicine for six months (1st November 2018 to 29th April 2019). The data collected by direct interview with patients or indirect (Patient Escort) by using a questionnaire form. The study showed that most of the patients were in 52 years of age or more 33 % and 27 % for both male and females, respectively, with mean \pm SD of age 56.5 ± 16.5 . 59.3 % of patients were retired, 55.6% of patients' education level was Illiterate. The study found that cumulative pleural effusion in both sides of the lung was equivalent ($P.v=0.1$), and the majority of patients (30%) had pneumonia. Plural effusion is a highly prevalent condition among the elderly who have various chronic diseases such as heart failure and lung disorders. It affects both sexes and bilateral sides.

RESUMEN. El derrame pleural es una anomalía que frecuentemente se desarrolla a partir de la acumulación de líquidos en la cavidad pleural y es causada por una variedad de trastornos primarios o secundarios, como malignidad, insuficiencia cardíaca y otras infecciones. Se trata de una afección común grave que encuentran tanto los médicos de tórax como los cirujanos de tórax en Irak. Por lo tanto, algunos estudios que contribuyan a comprender los factores predisponentes del derrame pleural ayuden a los médicos a superar algunos de los problemas que enfrentan. El objetivo del estudio fue determinar las características epidemiológicas de los pacientes que presentan derrame pleural y conocer los factores predisponentes de la enfermedad. Se realizó un estudio transversal en una muestra de pacientes que acudieron al Hospital Docente Al-Hussein, el estudio consta de 54 pacientes que sufrieron derrame pleural los cuales fueron diagnosticados por médicos especialistas del Hospital lobbies de medicina interna durante seis meses (1º noviembre de 2018 al 29 de abril de 2019). Los datos recogidos por entrevista directa con los pacientes o indirecta (acompañante del paciente) mediante el uso de un formulario de cuestionario. El estudio mostró que la mayoría de los pacientes tenían 52 años de edad o más, 33 % y 27 % tanto para hombres como para mujeres, respectivamente, con una media \pm DE de $56,5 \pm 16,5$ años. El 59,3 % de los pacientes eran jubilados, el 55,6 % del nivel educativo de los pacientes era analfabeto. El estudio encontró que el derrame pleural acumulado en ambos lados del pulmón era equivalente ($P.v = 0.1$), y la mayoría de los pacientes (30%) tenían neumonía. El derrame plural es una condición de alta prevalencia entre los ancianos que tienen diversas enfermedades crónicas como insuficiencia cardíaca y trastornos pulmonares. Afecta a ambos sexos y en ambos lados.

INTRODUCTION

Pleural effusion (PE) is accumulation fluid in the pleural space, there are two types of PE exudative pleural effusions and transudative pleural effusions, the common causes of exudative pleural effusions Infections were pneumonia, malignancy, collagen vascular disease. Common causes of transudative pleural effusions are congestive heart failure (CHF), cirrhosis, Nephrotic Syndrome ¹. Because of left ventricular failure and cirrhosis, the systemic factors that influence the formation and absorption of pleural fluid are altered this state called a transudative pleural effusion. When local factors that influence the formation and absorption of pleural fluid the exudative

pleural effusion was occurs because of bacterial pneumonia, malignancy, viral infection, and pulmonary embolism ². Dyspnea and underlying disease is the most common symptom of PE, it is noteworthy that severity dyspnea is correlated with the size of the effusion ³. The clinical picture is variable depending on the size, and location of the accumulating fluid, the symptom usually includes fever, cough, chest pain, anorexia, malaise, tachypnea, dyspnea, abdominal pain, distention, and vomiting ^{3,4}. With a delayed etiological diagnosis of the disease, most patients related with a higher morbidity and mortality of Pleural effusion ⁵. The disease can be classified according to chest radiograph in to small "hen the costophrenic angle was

KEY WORDS: across-sectional study, epidemiological study, pleural effusion, predisposing factors.

* Author to whom correspondence should be addressed. *E-mail:* maytham83n@gmail.com

obliterated but the hemi-diaphragm was not covered or medium when filled up to half of the hemithorax, and large in case of filled up more than half of the hemithorax ⁶. After one try, pleural aspiration has a sensitivity of 60% for pleural cancer. One repeat aspiration be taken into consideration; however, it is only helpful in a 10% of cases ⁷. Ultrasonography is common used to confirm the presence of effusion and is useful to identify the site of aspiration or drainage, especially in case of small pleural effusions ⁸. Some medicines have reported to cause pleural, however only in rare cases. The number of medications that generate pleural effusion is expanding daily and it now includes a wide variety of cardiovascular anti-inflammatory, chemotherapeutic, antibiotic compounds, amiodarone, nitrofurantoin, methysergide, bromocriptine, and ergoline derivatives are most well-known ⁹. Generically, patients should be examined systematically and complete medical history should be taken as a first step, with special attention for the patient's history asbestos exposure current and recent medications, and the presence of heart disease, tuberculosis, neoplastic disease, and connective tissue disease in the past or present. Second step, a physical examination should take ^{10,11}.

METHODOLOGY

A descriptive cross-sectional study conducted for the period from 1 November 2019 to 29 April 2020 with using a pre-validated questionnaire-based survey with direct interviewed after the verbal consent taken. The response rate was 94.3%. The study consists of 54 recumbent hospitalized Pt selected randomly from Hospital lobbies for internal medicine, in Al-Hussein Teaching Hospital. Data collected by direct interview with patients or indirect (patient escort) by using a pre-validated questionnaire form.

Ethical consideration

All the required permissions obtained from the Karbala Health Directorate, and ethical approval obtained from the Research Ethics Committee at the Technical Institute of Karbala

Statistical analysis

The data were analyzed by SPSS software version 24; the data were presented as numbers (N) and percentage (%). Chi-Sq. (χ^2) used to examine the relationship between demographic characteristics and predisposing factors after coded. P-values considering a statistically significant when $p \leq 0.05$.

Inclusion criteria

Patients who completed the questionnaire form.

Exclusion criteria

Those who refused or not completed the questionnaire form.

RESULTS

This study consists of 54 patients (55.6% were male and 44.4% were female), the demographic details were summarized in Table 1. Out of which 33 (61.1%) were more than 50 years old with Mean \pm SD (56.5 \pm 16.5) and there was no significant difference between gender $p.v = 0.9$. Regarding the education level this table shows that 30(55.6%) of patients were illiterate with significant correlation between the gender $P.V = 0.02$. On the other hand, the results showed that most of the patients were retired 32(59.3%) with highly statistical significant ($P.v = 0.001$). Moreover, 30(56%) of the study sample were smoker with significant association between the gender $p. = 0.05$.

Variables	Gender		Total pt. 54 (100%)	p-value
	Male Total = 30(55.6%)	Female Total = 24(44.4%)		
	Age group : Mean \pm Sd (56.5 \pm 16.5)			
20-30	4 (13.3%)	2 (8.3%)	6 (11.1%)	0.9
30-40	4 (13.3%)	4 (16.7%)	8 (14.8%)	
40-50	4 (13.3%)	3(12.5%)	7 (13%)	
≥ 50	18 (60.1%)	15 (62.5%)	33 (61.1%)	
	Education Level			
Illiterate	16 (53.3%)	14 (58.3%)	30 (55.6%)	0.02
Primary	4 (13.4%)	3 (12.5%)	7 (13%)	
Secondary	8 (26.7%)	4 (16.7%)	12 (22.2%)	
Graduate	2 (6.7%)	3 (12.5%)	5 (9.3%)	
	Occupation			
Worker	8 (26.7%)	0 (0.0%)	8 (14.8%)	0.001
Employer	4 (13.4%)	8 (33.3%)	12 (22.2%)	
Retired	18(60%)	14 (58.3%)	32 (59.3%)	
Housewife	0 (0.0%)	2 (8.3%)	2 (3.7%)	
	Smoker			
Yes	22 (73.3%)	8 (26.7%)	30(56%)	0.05
No	8 (33.3%)	16 (66.7%)	24 (44%)	

Table 1. Patients characteristics.

Fig. 1 illustrates the distribution of the study sample according to the affected with chronic diseases, the results showed that 89% had chronic diseases. Male: Female P.v = 0.4

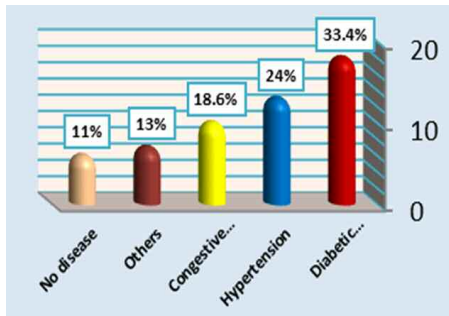


Figure 1. Distribution of the study sample according to chronic disease.

Fig. 2 represents 48 (89 %) samples with chronic diseases out of all study samples (54 patients), this figure showed that the majority of patients suffered from pneumonia 30% and Heart failure 29%, while the lower percentage 4% was in renal failure.

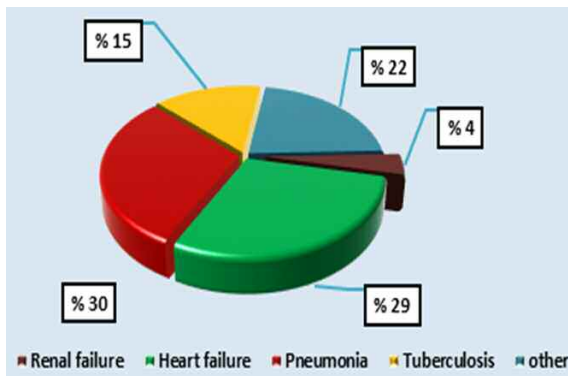


Figure 2. Distribution of the patients according to chronic disease.

Fig. 3 shows the sides where the pleural effusion was accumulated in the patient's lung, this figure showed convergence of the ratios in both sides. Male: Female P.v=0.1

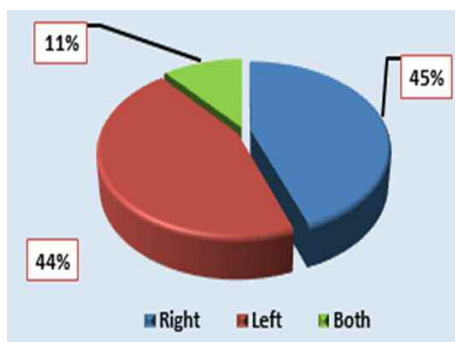


Figure 3. Accumulation of pleural effusion in patient's lung.

Table 2 depicts the signs and symptoms of patients with pleural effusion; the findings revealed that more than three quarter of the sample 81.4% had fever, while shortness of breath were 70.4%, followed by 61.1 % chest pain.

Sign and Symptoms	Total pt. = 54	
	No	%
Cough	16	29.6
Chest pain	33	61.1
Fever	44	81.4
Shortness of breath	38	70.4
Other	8	14.8

Table 2. Signs and symptoms of patients with pleural effusion.

Table 3 shows the results of cytology and biopsy investigations of pleural effusion in patients. In regards to cytology, 63 % of tests reveal undiagnosed, followed by 22.2 % with no malignant cells. On the other hand, undiagnosed found in 74 % of biopsy testing, followed by tuberculosis in 14.8 %.

Investigation	Gender				P.V			
	Male		Female			Total		
	No	%	No	%				
Cytology	Undiagnosed	16	29.6	18	33.3	34	63	0.03
	Lymphoma	-	-	2	3.7	2	3.7	
	Atypical cells	6	11.1	-	-	6	11.1	
	No malignant cells	8	14.8	4	7.4	12	22.2	
Biopsy	Undiagnosed	20	37	20	37	40	74	0.06
	Tuberculosis	6	11.1	2	3.7	8	14.8	
	No abnormality	4	7.4	-	-	4	7.4	
	Neutrophil infiltration	-	-	2	3.7	2	3.7	

Table 3. Distribution of the patients according to cytology and biopsy investigations.

DISCUSSION

Any accumulation of fluid in the pleural cavity called "pleural effusion", in one-year mortality in the range of 25-57% in patients with a non-malignant ¹². Out of 54 participants in this study as shown in Table 1, there were 30 (55.6%) males and 24(44.4%) were Female its compatible with the study in the north-west of Iran was men (53.4%) and women (46.6%) was similar to current study ^{14,15}. The highest percentage in the age group ≥ 50 (61.1%). On the other

hand, 30(55.6%) of the patients were illiterate, 32(59.3%) were retired. meanwhile, The smoking habit is considered a high-risk factor for infected pleural effusion the study of tobacco smoking as a risk factor for pleural effusion by Tewatia et al. ¹⁵ in India showed that 72.8% of smokers affected by pleural effusion, that compatible with the current study 26(48.1%) were smoker.

According to reported across Iraq in 2006 and WHO 2013 (40.4%) of Iraqi elderly suffering from hypertension and diabetes that consider high-risk groups for pleural effusion ¹²⁻¹³. This is consistent with our finding that shown in Fig. 1 (33.4%) of the participating patients have diabetes mellitus and 24% have hypertension. Several studies have found tuberculosis as the most common etiology in non-purulent PE in developing countries. In a study performed on patients with non-purulent PE in Qatar, tuberculosis (32.5%), pneumonia (19%), malignant PE (15.5%), and heart failure (13%) were described as the main causes of pleural effusion ¹⁶, this is similar to the current study 30%) out of patients with chronic diseases had pneumonia as shown in Fig. 2. Fig. 3 shows the accumulation of pleural effusion in the patient's lung sides, this figure showed convergence of the ratios in both sides. Male: Female P.v=0.1. Meanwhile, another study carried out in the Department of Pulmonary Medicine of a tertiary level teaching institution of eastern India revealed that Right-sided effusions were more common (59.6% on the right side, 38.4% left side, and 2% Bilateral) ¹⁷. Most studies indicate that high fever and chronic chest pain in addition to difficulty breathing are the most common symptoms in people with pleural effusion. Rani et al. ¹⁸ conducted one of these studies in Barcelona, Spain; it was found that the chief complaints were fever 80.5%, pleuritic chest pain 67.9%, cough 54.3%, dyspnea 37.8%. Another study in Santhiram Medical College and Hospital, Nandyal, Kurnool showed the clinical symptoms of the patient's cough 47.4% Chest pain 41.6%, and Dyspnea 69.4% ¹⁹. In the meanwhile, the current study revealed that more than three-quarters of the sample 81.4% had a fever, while shortness of breath was 70.4%, followed by 61.1 % chest pain (Table 2). By examining the case sheet of the patients, the physicians used the two methods (cytology and biopsy) to investigate the causes of pleural effusion, In regards to cytology, 63 % of tests reveal Undiagnosed, followed by 22.2 % with no malignant cells. On the other hand, Undiagnosed found in 74 % of biopsy testing, followed by tuberculosis in 14.8 %, (Table 3).

CONCLUSIONS

Plural effusion is a very common disease in the elderly, with some chronic diseases such as hyperten-

sion and lung diseases it is equally in both sexes and bilateral sides.

Recommendation

Any patient who suffers from chronic diseases, especially with signs and symptoms of dyspnea, should be Pleural effusion examined because the disease is very dangerous and sometimes leads to death.

Ethical approval and consent to participate

The Research Ethics Committee of the Technical Institute of Karbala granted and the Medical Council in the Holy Karbala Health Department all necessary clearances and ethical approvals.

Availability of data and materials

The data that support the findings of this study are available from the laboratories of Imam Al-Hussein Medical City but restrictions apply to the availability of these data, which used under license for the current study, and so are not publicly available. Data are however available for the authors upon reasonable request to get permission.

Acknowledgements

The authors express their thanks and appreciation to the Scientific Research Council at the Technical Institute of Karbala and the Medical Specialties Council in Karbala Health Department for their continued support in the completion of this scientific research.

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