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Original Research Article

Frequency and Causes of Fluid Accumulation in the Adjacent Space in Patients Admitted to Teaching Hospitals in Urmia

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ABSTRACT

Introduction: Therefore, early and timely treatment of the disease, as a result of reducing the time and burden of diagnostic and treatment costs on the community is very important, so this study aims to investigate the frequency of pleural effusions and the frequency of each type of effusion in all patients with Plural effusion was performed in Urmia hospitals. **Material and Methods:** The results of the analyzes included the amount of protein, lactate dehydrogenase (LDH) and pleural fluid and serum glucose, the ratio of protein, LDH and pleural fluid glucose to serum, the level of pleural fluid adenosine deaminase (ADA), smear and sputum culture for BK (bacillus tuberculosis). As well as common microbes of hot staining, smear and culture of pleural fluid, cytology of pleural fluid and the result of pleural biopsy (if performed for the patient), type of pleural effusion were recorded for all patients participating in the study. **Results:** 65 cases (1.59%) of right hemisphere involvement and 37 cases (6.33%) of bilateral involvement were reported. In terms of causes of transudative pleural effusion, in 58 cases (2.53%) congestive heart failure, 36 cases (33%) chronic renal failure, 8 cases (3.7%) liver cirrhosis, 3 cases (8.2%) Nephrotic syndrome was reported in 5 cases (6.4%) of open heart surgery. **Conclusion:** Based on the findings of this study, exudative pleural effusion was the most common type of pleural effusion and in terms of the site of involvement, in all three types of exudative, transudative and empirical pleural effusion, right hemithorax involvement was the most common.

Key words: Thoracoscopy, Decortication, Empyema, VATS

Introduction

Plural effusion means the accumulation of fluid in the pleural space. Pleural effusion is common in both inpatients and outpatients, and is a common finding among patients with cardiopulmonary symptoms. This phenomenon has a high prevalence in Iran. Pleural effusion has several causes, which are divided into two categories: exudative and transudative. The basis of effusion classification and finding the root cause is based on thoracosynthesis [1-3]. Due to the wide variety of differential diagnoses, a systematic approach to research is needed to identify the causes [4-6]. In patients with transudative effusion, diagnosing the causes usually occurs without much difficulty, but exudative effusions require multiple and accurate differential diagnoses. Due to the relatively high prevalence of malignant pleural effusions [7-9] (as the second most common cause of exudative effusions) and its proximity to parapneumonic effusions as the most common cause of exudative pleural effusions, it is necessary to treat patients with malignant rejection [10-13]. Considering the frequency of pleural effusions and the frequency of etiologies of effusions, especially the most common causes of exudative pleural effusions in the community [14-16]. for rapid and early diagnosis of the disease by choosing more specific and appropriate diagnostic methods (due to the limited and localized range of differential diagnoses) [17-19]. Therefore, early and timely treatment of the disease, as a result of reducing the time and burden of diagnostic and treatment costs on the community is very important, so this study aims to investigate the frequency of pleural effusions and the frequency of each type of effusion in all patients with Plural effusion was performed in Urmia hospitals.

Material and Methods

In this study, sampling was done by census method and included all patients admitted to Imam Khomeini Hospital in Urmia with a diagnosis of pleural effusion or empyema. In this descriptive cross-sectional and retrospective study (case study), first through the Hospital Information System (HIS) of the hospital by searching for the desired keywords (pleural effusion and empyema) the file number of all patients with these two diagnoses in The mentioned hospitals were hospitalized, then by referring to the archives (medical records) of the mentioned hospital based on the number of files, the archives of the patients were extracted and the required data from the patients' files were designed and recorded in a two-part checklist. The first part is a

checklist for recording patients' demographic information (age, sex, occupation and level of education) and the second part is a place to record the results of analyzes including protein, lactate dehydrogenase (LDH) and pleural fluid and serum, protein ratio, LDH and fluid glucose. Pleural effusion, Adenosine deaminase (ADA) level of pleural fluid, smear and sputum culture for BK (bacilli) as well as common microbial gram staining, pleural fluid smear and culture, pleural fluid cytology and pleural biopsy result (if performed for Patient), the type of pleural effusion and the recorded cause of pleural effusion in the patient's file. All patient information is available to the researcher only and the results of the study are presented in groups and without names. All stages of the study were approved by the University Ethics Committee (IR.UMSU.REC.1397.009)

Results

In this study, the medical records of 450 patients admitted to Imam Khomeini Hospital in Urmia with a diagnosis of pleural effusion and empyema were reviewed. Of the total study population, 262 (4.64%) were male and 145 (6.35%) were female. The mean and standard age deviation of patients was 21.61 ± 95.18 years with a minimum age of 16 and a maximum age of 100 years. Out of 407 patients with pleural effusion, 244 (60%) had exudative pleural effusion, 110 (27%) had transudative effusion and 53 (13%) had empyema. (graph 1). To investigate the difference in the frequency of different types of pleural effusions between males and females, chi-square test was used, according to which there was a significant difference between males and females in terms of frequency of different types of effusions ($p = 0.002$). To evaluate the significance of the age difference between the 3 groups (3 types of effusion), one-way ANOVA test (F test) was performed. Based on this test, the age difference between the 3 groups was significant. ($P = 0.01$) The age difference between groups 1 and 3 (exudative effusion and empyema) was significant ($p = 0.02$) and the difference between groups 2 and 3 (transudate and empyema) was significant ($p = 0.01$). Regardless of the type of effusion, out of a total of 407 patients studied, the cause of pleural effusion in 180 patients (34.44%) was pneumonia (and with a much lower percentage of other infectious causes including lung abscess and lung hydatid cyst), in 57 patients (14 %) Congestive heart failure, 53 patients (13%) lung malignancies, 36 patients (9.8%) chronic kidney failure, 34 patients (4.8%) other malignancies (lymphoma, cancer, etc.), 14 patients (3 Pulmonary tuberculosis was diagnosed in 4.4% and in other 35 patients (4.8%) other causes

(prevalence, effusion after open heart surgery, liver cirrhosis, pulmonary thromboembolism, nephrotic syndrome, bronchiectasis, interstitial lung disease and lupus) were diagnosed. . Out of 407 cases of pleural effusion, in 113 cases (8.27%) there was left hemithorax involvement, in 180 cases (2.44%) there was right hemithorax involvement and in 114 cases (28%) there was bilateral involvement. Out of 244 cases of exudative pleural effusion, 158 (8.64%) were male and 88 (2.35%) were female. The mean and standard deviation of age of patients with exudative effusion was 83.61 ± 58.19 years with a minimum age of 16 and a maximum age of 92 years. Out of 244 cases of exudative effusion, in 82 patients (6.33%) there was left hemithorax involvement, 91 patients (3.37%) had right ventricular involvement and in 71 patients (1.29%) had bilateral involvement. In terms of frequency of causes in 135 cases (3.55%) pneumonia, 50 cases (5.20%) lung malignancy, 33 cases (13.5%) other malignancies (lymphoma, breast cancer, etc.), 13 cases (5 3.3%) tuberculosis, 7 cases (9.2%) of pulmonary thromboembolism and the remaining 6 cases (5.2%) of other causes (lupus erythematosus, open heart surgery, interstitial lung disease and bronchiectasis) were reported. Out of 110 cases of transudative pleural effusion, 60 (54.5%) were male and 50 (5.45%) were female. The mean and standard deviation of age of patients with transudative effusion was 06.63 ± 53.16 years with minimum age of 24 and maximum age of 90 years. 8 cases (3.7%) of left hemithorax involvement, 65 cases (1.59%) of right hemisphere involvement and 37 cases (6.33%) of bilateral involvement were reported. In terms of causes of transudative pleural effusion, in 58 cases (2.53%) congestive heart failure, 36 cases (33%) chronic renal failure, 8 cases (3.7%) liver cirrhosis, 3 cases (8.2%) Nephrotic syndrome was reported in 5 cases (6.4%) of open-heart surgery.

Discussion

Of the total subjects, 4.64% were male and 6.35% were female. In the study of Alsamawi et al., 76% of the study population were male and 24% were female. In the article by Golshan et al., Out of the total number of patients with pleural effusion studied, 62% were male and 38% were female [20-22]. In Izadi et al.'s study, 56% of the study population were male and 44% were female. Thus, the results of this article were consistent with the findings of Alsamawi, Golshan and Izadi in terms of sexual frequency distribution of patients with pleural effusion (the prevalence of pleural effusion in males was higher than females) [23]. In this study, the mean age

of patients was 21.61 years (with a standard deviation of 95.18%) with a minimum age of 16 and a maximum age of 100 years. In the article by Golshan et al., The age range of patients with pleural effusion was 18 to 85 years. In the study, Izadi and his colleague were 9.62 ± 5.17 years old [24]. Considering that the average age of patients with pleural effusion in the above studies was over 60 years, so the results of this article were consistent with the above studies in terms of the average age of patients. In this study, out of 407 patients with pleural effusion, 60% had exudative effusion, 27% had transudative effusion and 13% had empyema [25]. In other words, the most common type of pleural effusion in this article was identified as exudative pleural effusion. In the present study, out of a total of 407 cases of pleural effusion, in 27.28% there was left lung involvement, 2.44% in right lung involvement and in 28% of effusions there was bilateral involvement. In other words, separately, out of 244 cases of exudative effusion were reported in 33.6% of the conflict on the left, 3.37% on the right and in 1.29% of the bilateral conflict. Out of 110 cases of transudative effusion, 3.7% had left involvement, 1.59% had right lung and 6.33% had bilateral involvement, and out of 53 cases, empyema had 43.4% left involvement, 3.45% had right involvement. And 3.11% of bilateral conflicts were reported. Therefore, the most common side of involvement in all types of pleural effusion (exudative, transudative, and empyema) was the right side [26]. In Izadi et al.'s article, most effusions were unilateral and right lung effusions with a frequency of 4.75% were the most common. Thus, the results of this article were consistent with the findings of Izadi et al. In the article by Porcel et al., The main causes of pleural effusion were reported as: malignancies (27%), heart failure 21% and pneumonia (19%), respectively. In a study by Baladi Mousavi et al., Out of a total of 63 patients with end-stage chronic renal failure and simultaneous pleural effusion, 42 (6.66%) had transudate effusion and 21 (4.33%) had exudate [27]. In the study of Chinchkar et al., The most common etiology of pleural effusion was reported as: metastasis (24%), parapneumonic effusion (22%) and congestive heart failure (18%). Thus, the results of this article on the most common causes of pleural effusion, regardless of the type of effusion, did not agree with the findings of the above studies [28]. In the case of Puchalski et al. In the case of bilateral effusions, exudative effusions are reported to be more common than transudative effusions. The results of this article were consistent with the findings of Puchalski in terms of the frequency of pleural effusions, but did not agree with the findings of Baladi Mousavi [29]. In this study, the most common causes of pleural effusion, regardless of the type of effusion, were: pneumonia (34.44%), congestive heart

failure (14%) and lung malignancies (13%), respectively [30] According to Alsamawi et al., The most common causes of pleural effusion were tuberculosis (TB) (5.32%) followed by pneumonia (19%) and malignancies (5.15%). In the study of Golshan et al., The most common etiologies of pleural effusion were reported as: congestive heart failure (4.39%), malignancies (2.27%) and pneumonia (8%) [31]. According to Baladi Mousavi et al., The most common cause of exudative effusions in patients with end-stage chronic renal failure was infectious diseases (pneumonia and TB) (4.52%). In Izadi et al.'s article, the most common causes of exudative pleural effusion were reported as: malignancies (33%), parapneumonic effusion (5.15%) and tuberculosis (15%), respectively. In the article by Puchalski et al., [32] Malignancies are introduced as the most common single cause of bilateral exudative effusions. Thus, the results of this study on the most common causes of exudative effusions were consistent with the article by Baladi Mousavi et al., But did not agree with the findings of Izadi and Puchalski studies. The most common causes of transudative pleural effusion in our study were congestive heart failure (2.53%), chronic renal failure (33%) and liver cirrhosis (3.7%), respectively. According to Baladi Mousavi et al., [33]. The most common causes of transudative effusions were: heart failure (3.64%), excessive fluid volume (3.33%) and liver cirrhosis (2.4%), respectively. Therefore, the results of this study are consistent with the article by Baladi Mousavi et al. [34].

Conclusion

As a summary of this discussion and the above-mentioned issues, it is necessary to state this important, key and effective point about the present article that this article has been done only on patients admitted to the infectious and internal wards of the mentioned hospitals and as you know most of the patients Hospitalization in these wards, especially the infectious ward, consists of patients with pneumonia and other causes of pulmonary infection, so the range of target patients for review and article on this subject (including infectious, internal, cardiac, surgical, etc.) in this article Faced with limitations, this issue may be able to explain some of the differences between the findings and results of this article with the findings of other studies and research in this field in other parts of Iran and the world. Based on the findings of this study, exudative pleural effusion was the most common type of pleural effusion and in terms of the site of involvement, in all three types of exudatives, transudative and empirical pleural effusion, right

hemithorax involvement was the most common. The most common causes of exudative pleural effusion were pneumonia in the first place, followed by lung malignancies, other malignancies (breast cancer, lymphoma, etc.) and tuberculosis, respectively. The most common causes of transudative pleural effusion were firstly, congestive heart failure, followed by prevalence, chronic renal failure, and liver cirrhosis, respectively. Pneumonia was also reported to be the most common cause of empyema.

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