

Risk Factors of Pneumothorax at Aleppo University Hospitals

Dear Editor,

Spontaneous pneumothorax can be either primary due to the rupture of subpleural bleb or secondary due to underlying lung disease, usually bullous emphysema.¹ Relatively little is known about the causative factors of spontaneous pneumothorax in Arab Countries.¹ This is the first study and the primary step towards understanding the risk factors and causes of spontaneous pneumothorax in Syria.

Syrian Arabic Republic is a country in the Middle East with a total population of about 20,367,000 million in 2010. In comparison to the western countries, it has a relatively young population with only about 10% of populations aged ≥ 50 years.³ This study was performed at Aleppo University Hospitals (Aleppo University Hospital, Alkindi Hospital, Heart Surgery Center) recruiting patients with spontaneous pneumothorax from January 2008 to May 2010.

The diagnosis of spontaneous pneumothorax was based on the presence of air in the pleural cavity on chest radiograph. Patients were directly studied in the hospital and information in regards to variables such as age, sex, smoking status, body mass index, patients' personal history, familial history, and classification of spontaneous pneumothorax was collected.

Pneumothorax cases admitted to Aleppo University Hospitals were directly studied. All cases of traumatic iatrogenic or non iatrogenic pneumothorax were excluded. A total of 71 patients with spontaneous pneumothorax were admitted to Aleppo University Hospitals were recruited in the study. Two cases of these were excluded because they were pneumothorax associated with pleural effusion; therefore, the remaining 69 cases were included in the study.

In This study 53 (76.8%) cases were regarded as primary spontaneous pneumothorax and 16 (23.2%) patients as secondary spontaneous pneumothorax. Of the 53 primary spontaneous pneumothorax patients, 49 (92.5%) patients were male and 4 (7.5%) were female. Of patients with secondary spontaneous pneumothorax, 15 (93.7%) were male and 1 (6.3 %) were female. Therefore, the prevalence of spontaneous pneumothorax was more among male patients. The ages (mean \pm SD) for primary and secondary spontaneous pneumothorax were 24 \pm 6.1 years and 56.7 \pm 16.4 years, respectively. The ages of 47 (88.7%) patients of primary spontaneous pneumothorax patients were ≤ 30 years, while the ages of 14 (87.5%) patients of secondary spontaneous pneumothorax were ≥ 40 years ($P < 0.0001$). Thirty eight patients (71.7%) of primary spontaneous pneumothorax patients, and 14 patients (87.5%) of secondary spontaneous pneumothorax were current smokers. The weights (mean \pm SD) were 63 \pm 7.2 kg and 65.1 \pm 9.9 kg for primary and secondary spontaneous pneumothorax, respectively. The heights (mean \pm SD) were 173.4 \pm 5.3 cm and 169.5 \pm 4.8 cm for primary and secondary spontaneous pneumothorax, respectively. The BMIs (mean \pm SD) was 20.9 \pm 2.1 kg/m² and 22.6 \pm 3.5 kg/m² for primary and secondary spontaneous pneumothorax, respectively. There was significant ($P < 0.0001$) difference between the number of patients with primary spontaneous pneumothorax ($n=52$, 98.1%) and secondary spontaneous pneumothorax ($n=11$, 68.8%).

The presence of familial history was 1.9% and 6.3% for primary and secondary spontaneous pneumothorax, respectively. Of patients with primary spontaneous pneumothorax, 19 (35.8%) patients had left pneumothorax, 33 (62.3%) had right pneumothorax, and 1 (1.9%) had two sided pneumothorax. Of patients with secondary spontaneous pneumothorax, 6 (37.5%) patients had left pneumothorax, 9 (56.2%) had right pneumothorax, and 1 (6.3%) had bilateral pneumothorax. Of 16 patients with secondary spontaneous pneumothorax, 12 had been diagnosed as having chronic obstructive pulmonary diseases (COPD), 3 as having tuberculosis, and one as having asthma.

Smoking is a significant risk factor for primary spontaneous pneumothorax (PSP).² In the present study 71.7% and 87.5% of primary and secondary spontaneous pneumothorax were current smokers, respectively. Similarly, a study by Ayed et al showed that 78% and 76% of primary and secondary spontaneous pneumothorax were current smokers, respectively.²

Although secondary spontaneous pneumothorax is most commonly associated with chronic obstructive pulmonary disease, pneumocystis jirovecii infection, cystic fibrosis, and tuberculosis, it can nearly complicate every lung disease.⁴ In the current study, COPD and emphysema followed by tuberculosis were the causes for the majority of secondary spontaneous pneumothorax. Ayed et al.¹ showed a similar outcomes, while Faruqi et al.⁵ showed that pulmonary tuberculosis (41.66%) was the cause for the ma-

majority of secondary spontaneous pneumothorax. Moreover, Wait et al.⁴ showed that AIDS (27%) and COPD (36%) were the most prevalent causes of secondary spontaneous pneumothorax.

In the present study, the mean ages of patients with primary or secondary spontaneous pneumothorax were 24 and 57 years, respectively. Similar to this study, Ayed et al.¹ showed mean ages of 24 and 45 years for primary and secondary spontaneous pneumothorax, respectively. Moreover, a similar ages were shown by Faruqi and colleagues.⁵ The mean age for secondary spontaneous pneumothorax in Japan was shown to be 66 years.⁶ Similar to the study by Ayed and colleagues, a large proportion (88.7%) of primary spontaneous pneumothorax patients had an age of ≤ 30 years.¹ The higher occurrence of primary spontaneous pneumothorax partly reflect the relatively young population structure of Arab countries (Syria and Kuwait).

It is a well-established fact that men are more prone to developing spontaneous pneumothorax than women.¹ In the present study a male to female ratio of 12.2:1 and 15:1 were obtained for primary and secondary spontaneous pneumothorax, respectively. Moreover, Ayed et al. reported that such ratios were 20:1 and 22:1 for primary and secondary spontaneous pneumothorax, respectively. However, a study by Freixinet et al.⁶ showed a male to female ratio of 6:1 for primary spontaneous pneumothorax. Such a difference might be partly due to the fact that female smokers in Syria are less than in Europe. Moreover, this study shows an association between the occurrence of spontaneous pneumothorax and low BMI. The mean BMI was 20.9 and 22.6 for primary and secondary spontaneous pneumothorax, respectively. Such findings are similar to the values previously reported for BMI in primary (19.3) and secondary (22.4) spontaneous pneumothorax, respectively.

In this study right pneumothorax was more prevalent in primary (62.3%) and secondary (56.2%) spontaneous pneumothorax. This finding is similar to that of Ayed et al.¹ who showed that right pneumothorax was more prevalent and for primary (57%) and secondary (76%) spontaneous pneumothorax. The present study showed that the prevalence of bilateral spontaneous pneumothorax was rare (1.9 % for primary and 6.3% for secondary spontaneous pneumothorax), which is similar to Freixinet et al.⁶ report, which showed that the prevalence of bilateral primary spontaneous pneumothorax was (3.6%). In agreement with a previous report,¹ the present study did not show any association between the occurrence of spontaneous pneumothorax and familial history.

The data of this study indicate that the most important risk factors for primary spontaneous pneumothorax are male gender, smoking, age ≤ 30 years, and low BMI. Moreover, they show that the most important risk factors for secondary spontaneous pneumothorax are male gender, smoking, age ≥ 40 years, and low BMI. In addition they demonstrate that the most important causes of secondary spontaneous pneumothorax are chronic obstructive pulmonary disease (emphysema).

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