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AUDIT OF DIAGNOSIS AND MANAGEMENT OF PNEUMOTHORAX AT AL SHAAB TEACHING HOSPITAL

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Summary.

Introduction. A pneumothorax is defined as the presence of air within the pleural cavity, it is classified as spontaneous primary or secondary and traumatic iatrogenic and non-iatrogenic. Despite having Sudan national protocol for the management of pneumothorax, there appears to be wide variation in clinical practice in diagnosis and management of pneumothorax

Aims and objectives. The audit aims to study the initial management of primary and secondary pneumothorax at Al SHAAB teaching hospital.

Method. Data collection was made from patients' records with a diagnosis of pneumothorax

Results. Fifty-five patients who were admitted to the chest department were enrolled. The majority of patients were between 25-45 years of age (40%), male with a female ratio of 3:1. The main presenting symptoms were cough 50 (94.4%) and shortness of breath 44(80%) followed by chest pain 20(36.4). Twenty patients (36.4) were a smoker and 35 (63,.6%) were a non-smoker. Pulmonary tuberculosis is the leading cause of pneumothorax 33(60,1%) and bronchial asthma 4(7.3%) while primary spontaneous were 9(16.4%). Clinically and radiologically the right side is more affected than the left side 34(61.8%) and 19(16.4%) respectively, pure pneumothorax in29 (52.7%) and hydropneumothorax in 26(37.3%). The size of pneumothorax is large in 25 (45.5%), medium18 (32.7), and small in 12(21.8%). Thirty-nine (70.9%) were managed with chest tube thoracostomy, 12 (21.8) by simple aspiration, and 4 (7.3%) responded to the observation of patients for two weeks.

Conclusion. There is suboptimal compliance to the Sudan protocol in the management of pneumothorax.

Recommendations. We recommended federal ministry of health to avail the protocol of diagnosis and management of pneumothorax in all emergency departments, also we recommended training of all registrars of chest medicine in the protocol of diagnosis and management of pneumothorax.

Keywords: Pneumothorax, management, protocol.

Rezumat. Auditul diagnosticului și managementului pneumotoraxului la Spitalul didactic al AL SHAAB.

Introducere. Un pneumotorax este definit ca prezența aerului în cavitatea pleurală, este clasificat ca spontan primar sau secundar și traumatic iatrogen și non-iatrogen. În ciuda faptului că există un protocol național Sudan pentru gestionarea pneumotoraxului, pare să existe o variație largă în practica clinică în diagnosticul și managementul pneumotoraxului.

Scopuri si obiective. Auditul își propune să studieze managementul inițial al pneumotoraxului primar și secundar la spitalul didactic Al SHAAB.

Metodă. Colectarea datelor s-a făcut din fișele pacienților cu diagnostic de pneumotorax

Rezultate. Au fost înrolați cincizeci și cinci de pacienți care au fost internați în secția de piept. Majoritatea pacienților aveau vârste cuprinse între 25-45 de ani (40%), bărbați cu un raport feminin de 3:1. Principalele simptome de prezentare au fost tuse 50 (94,4%) și dificultăți de respirație 44 (80%) urmate de durere în piept 20 (36,4). Douăzeci de pacienți (36,4) au fost fumători și 35 (63,6%) au fost nefumători. Tuberculoza pulmonară este cauza principală a pneumotoraxului 33(60,1%) și a astmului bronșic 4(7,3%), în timp ce primar spontan au fost 9(16,4%). Clinic și radiologic partea dreaptă este mai afectată decât partea stângă 34(61,8%) și respectiv 19(16,4%), pneumotorax pur în 29 (52,7%) și hidropneumotorax în 26 (37,3%). Dimensiunea pneumotoraxului este mare la 25 (45,5%), medie18 (32,7) și mică la 12 (21,8%). Treizeci și nouă (70,9%) au fost tratați cu toracostomie cu tub toracic, 12 (21,8) prin aspirație simplă și 4 (7,3%) au răspuns la observarea pacienților timp de două săptămâni.

Concluzie. Există o conformitate suboptimă la protocolul Sudan în gestionarea pneumotoraxului.

Recomandări. Am recomandat Ministerului Federal al Sănătății să folosească protocolul de diagnostic și management al pneumotoraxului în toate departamentele de urgență, de asemenea, am recomandat instruirea tuturor registratorilor de medicină toracică în protocolul de diagnostic și management al pneumotoraxului.

Cuvinte cheie: pneumotorax, management, protocol.

Резюме: Аудит диагностики и лечения пневмоторакса в Учебной больнице АЛЬ-ШААБ.

Введение. Пневмоторакс определяется как наличие воздуха в плевральной полости, он классифицируется как спонтанный первичный или вторичный, травматический ятрогенный и неятрогенный. Несмотря на наличие суданского национального протокола по лечению пневмоторакса, клиническая практика, по-видимому, сильно различается в диагностике и лечении пневмоторакса.

Цели и задачи. Аудит направлен на изучение начального лечения первичного и вторичного пневмоторакса в клинической больнице Альшааб.

Метод. Сбор данных производился из историй болезни пациентов с диагнозом пневмоторакс.

Полученные результаты. В исследование были включены 55 пациентов, госпитализированных в грудное отделение. Большинство пациентов были в возрасте от 25 до 45 лет (40%), мужчины с соотношением женщин 3:1. Основными симптомами были кашель 50 (94,4%) и одышка 44 (80%), сопровождаемая болью в груди 20 (36,4%). 20 пациентов (36,4) были курильщиками и 35 (63,6%) не курили. Туберкулез легких является ведущей причиной пневмоторакса 33 (60,1%) и бронхиальной астмы 4 (7,3%), тогда как первичный спонтанный - 9 (16,4%). Клинически и рентгенологически правая сторона больше поражена, чем левая 34 (61,8%) и 19 (16,4%) соответственно, чистый пневмоторакс у 29 (52,7%) и гидропневмоторакс у 26 (37,3%). Размер пневмоторакса большой у 25 (45,5%), средний у 18 (32,7) и малый у 12 (21,8%). Тридцать девять (70,9%) лечились с помощью плевральной торакостомии, 12 (21,8) — с помощью простой аспирации и 4 (7,3%) ответили на наблюдение за пациентами в течение двух недель.

Вывод. Существует субоптимальное соблюдение суданского протокола при лечении пневмоторакса.

Рекомендации. Мы рекомендовали федеральному министерству здравоохранения использовать протокол диагностики и лечения пневмоторакса во всех отделениях неотложной помощи, а также мы рекомендовали обучение всех регистраторов легочной медицины протоколу диагностики и лечения пневмоторакса.

Ключевые слова: Пневмоторакс, менеджмент, протокол.

Literature Review

A pneumothorax is an abnormal collection of air in the pleural space between the lung and the chest wal (1), A primary spontaneous pneumothorax is one that occurs without an apparent cause and in the absence of significant lung diseases, A secondary spontaneous pneumothorax occurs in the presence of existing lung disease(2), Smoking increases the risk of primary spontaneous pneumothorax, while the main underlying causes for secondary pneumothorax are COPD, asthma, and tuberculosis(3).

A primary spontaneous pneumothorax tends to occur in a young adult without underlying lung problems, and usually causes Chest pain and mild breathlessness(4), Secondary spontaneous pneumothorax, Hypoxemia is usually present and may be observed as cyanosis . Hypercapnia is sometimes encountered, The sudden onset of breathlessness in someone with chronic obstructive pulmonary disease, cystic fibrosis, or other serious lung diseases should therefore prompt investigations to identify the possibility of a pneumothorax(5), physical examination, breath sounds may be diminished on the affected side, partly because air in the pleural space dampens the transmission of sound. the conduction of vocal vibrations to the surface of the chest may be altered. Percussion of the chest may be perceived as hyperresonant, and vocal resonance and tactile fremitus can both be noticeably decreased. Importantly, the volume of the pneumothorax may not be well correlated with the intensity of the symptoms experienced by the victim, and physical signs may not be apparent if the pneumothorax is relatively small(6).

Tension pneumothorax is generally considered to be present when a pneumothorax leads to significant impairment of respiration and/or blood circulation. This causes a circulatory shock. tends to occur in clinical situations such as ventilation, resuscitation, trauma, or in people with lung disease, It is a medical emergency and may require immediate treatment without further investigations(7).

Two general categories of histopathologic changes can be identified: (1) nonspecific changes, reflecting the lung's acute and chronic response to localized injury, and (2) changes suggesting an underlying lung disease that may have played an etiologic role in the development of pneumothorax(8),

Sub atmospheric pleural pressure, which is approximately -3 to -5 cmH2O at functional residual capacity makes pleura a unique organ in the human body. The negative Pressure is critical for maintaining the lungs in a properly inflated state and for proper blood circulation within the thorax. Significant and sudden pleural pressure changes associated with major pleural pathologies, as well as therapeutic interventions may be associated with life-threatening complications(9)

Regarding the choice between conservative treatment and chest drainage in the first episode, there is no evidence on whether one option is superior to the other. Video-assisted thoracic surgery represents the most common and preferred surgical approach. A primary surgical approach to patients with their first PSP seems to guarantee a lower recurrence rate than that of a primary approach consisting of a chest drainage positioning; conversely, the percentage of futile surgical interventions that would entail this aggressive attitude must be carefully evaluated. Surgical pleurodesis is recommended and frequently performed to limit recurrences; talc poudrage offers

efficient pleurodesis, but a considerable number of surgeons are concerned about administering this inert material to young patients.(10)

Material and method:

- *Study design:* Observational analytic cross-sectional hospital-based study.

- *Study area:* The study was conducted at Al-Ashaab Teaching Hospital – in Khartoum City, Sudan. AL-Ashaab Teaching Hospital is a tertiary hospital that specializes in cardiac and pulmonary diseases. It has an emergency department working all days of the week, basic laboratory, pulmonary function testing, sleep lab, diagnostic and therapeutic bronchoscope, cardiac catheter lab, and surgical theater. It is a training center for medical registrars and higher specialists It has a respiratory intensive care unit and asthma care unit as well as cardiac care unit.

- *Study population:* Registered confirmed with pneumothorax patients 18 years of age and more, who attended Al-Ashaab Teaching Hospital, for follow-up in the referred clinic and those who attended the emergency department during the study period.

- *Inclusion Criteria:* Patients who were diagnosed by a physician with pneumothorax.

- *Sample size:* All patients diagnosed with pneumothorax attending Al-Shaab Teaching Hospital refer clinic and emergency department.

- *Tools of data collection:* Data were collected from patients by a questionnaire, demographic data, and questions about specific domains of interest, and co-morbidities.

-*Statistical analysis:* Was conducted by computer using an excel sheet

- *Ethical consecration:* The study was approved by the ethics review committee of the Sudan Medical Specialization Board and local committee at Alshaab hospital.

Results and Discussion:

Fifty-five patients who were admitted to the chest department were enrolled. The majority of patients were between 25-45 years of age (40%), male with a female ratio of 3:1 (fig 1).

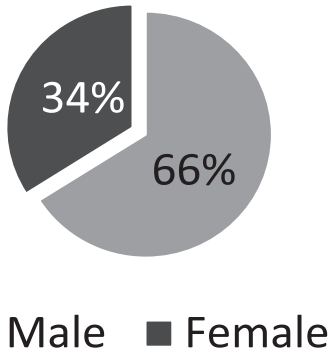

Figura 1. Distribution by gender.

In this study 20 patients (36.4%) were a smoker and 35 (63,.6%) were a non-smoker in contrast to Larson R.et al(11) It is much higher in smokers (12% vs. 0.1% lifetime risk) (fig 2).

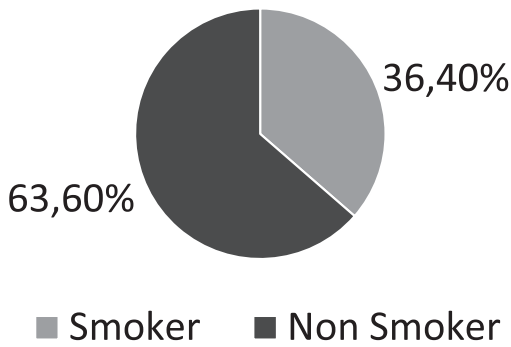

Figura 2. Smoking status.

The main presenting symptoms were cough 50 (94.4%)and shortness of breath 44(80%)followed by chest pain 20(36.4) in contrast to Karima R. et al(12) the most common presenting symptoms are chest pain and shortness of breath (64 to 85%) (fig 3).

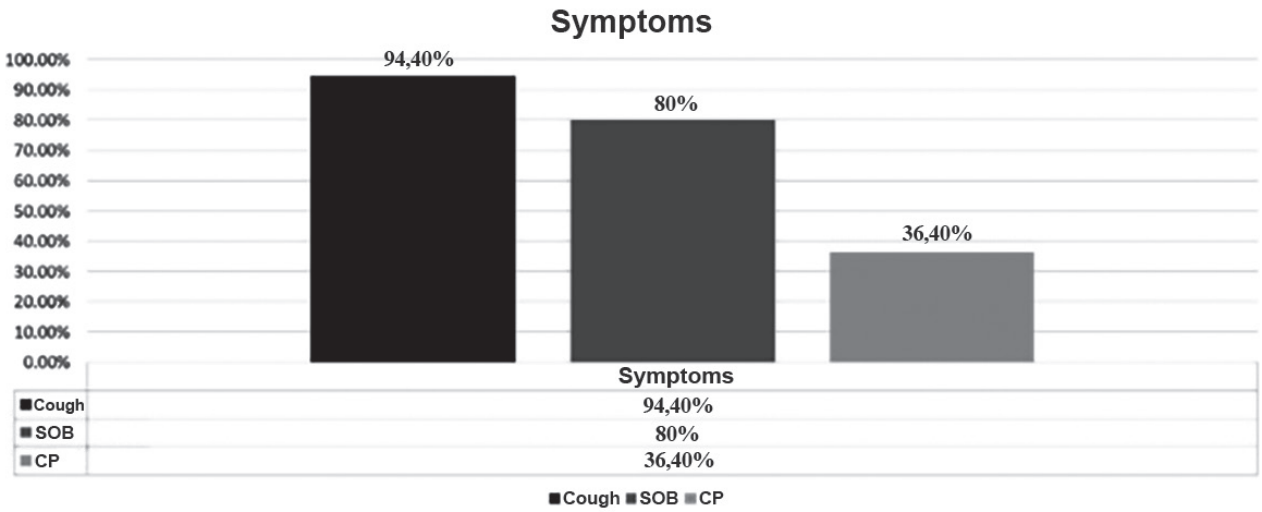

Figura 3. Symptoms

Pulmonary tuberculosis is the leading cause of pneumothorax 33(60,1%) and bronchial asthma 4(7.3%) while primary spontaneous were 9(16.4%) which is coincide with Syed Fayyaz Hussain from Pakistan(13) B was the commonest cause of secondary pneumothorax, closely followed by COPD (fig. 4).

Thirty-nine (70.9%) were managed with chest tube thoracostomy, 12 (21.8)by simple aspiration, and 4 (7.3%) responded to the observation of patients for two weeks in contrast to Hany Hasan Elsayed from Egypt (14) Patients randomized to NA (65 patients) were treated by a maximum of two aspirations and

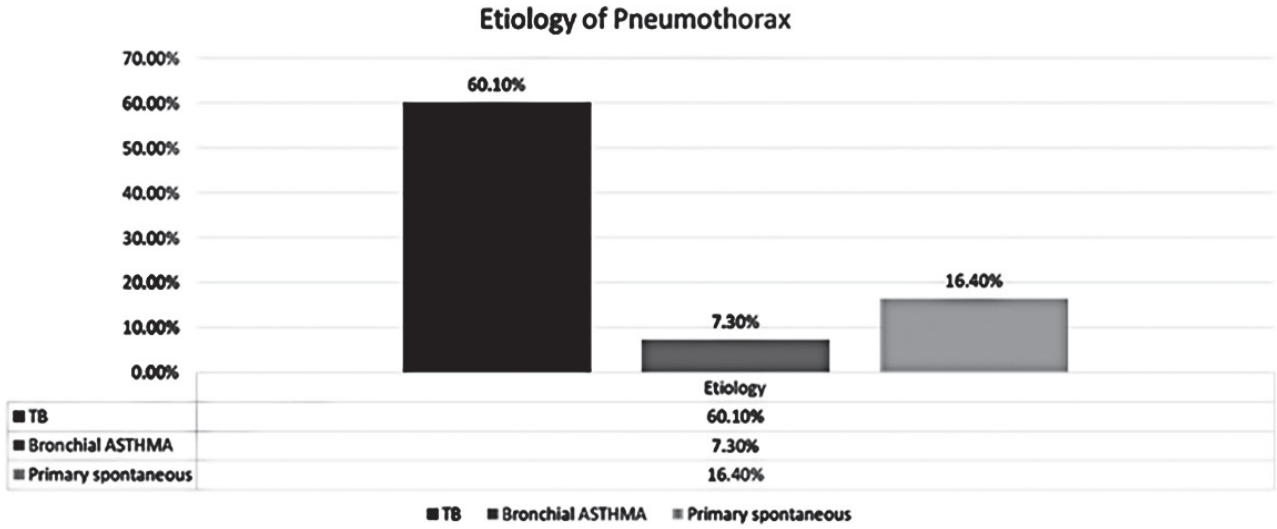

Figura 4. Etiology of pneumothorax.

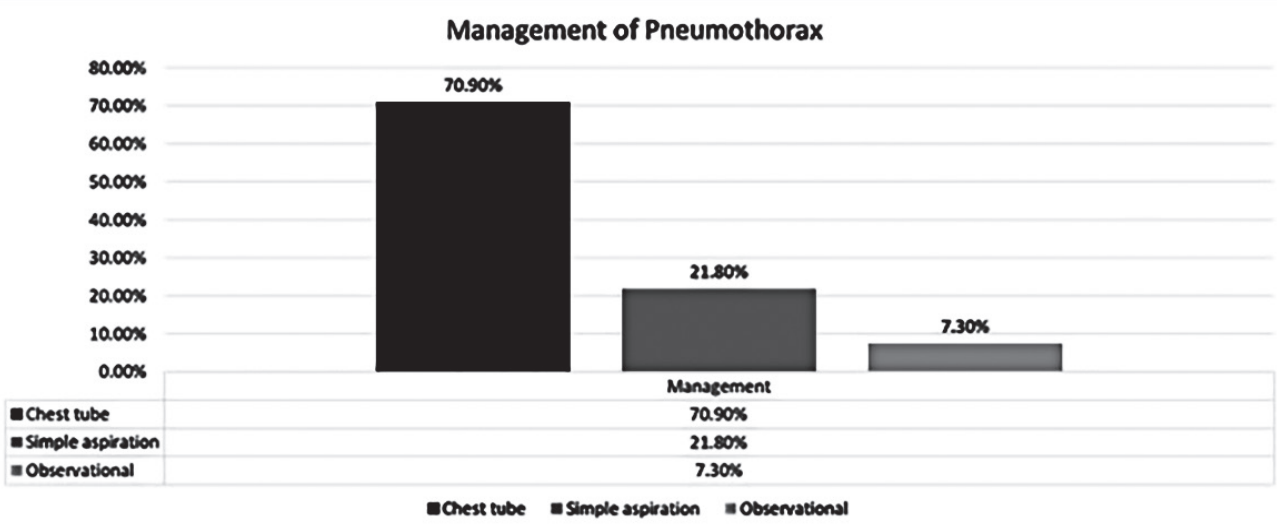

Figura 5. Management of Pneumothorax.

adequate response was guided by a pneumothorax of less than 20% on an X-ray and absence of any symptoms of breathlessness (fig. 5).

Absence of either criteria would shift the patient to having a CTD (31.2% of NA patients eventually needed CTD). Patients randomized to CTD (63 patients) had a 12–28 Ch chest tube connected to a chest drainage system inserted in the 4th or 5th intercostal space in the mid axillary line (the 5th space is always outside the safe triangle for CTD as recommended by the BTS guidelines).

Conclusion. There is suboptimal compliance to the Sudan protocol in the management of pneumothorax.

Recommendations. We recommended federal ministry of health to avail the protocol of diagnosis and management of pneumothorax in all emergency departments, also we recommended training of all registrars of chest medicine in the protocol of diagnosis and management of pneumothorax.

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