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RESEARCH ARTICLE

PLEURISY IN CHILDREN : EXPERIENCE OF THE DEPARTMENT OF PEDIATRICS

Kaoutar Abidi¹, Najoua Aballa², Karima El Fakiri¹, Nouredine Rada¹, Ghizlan Draiss¹, Kamili El Ouafi El Aouni² and Mohamed Bouskraoui¹

1. Department of Pediatrics, Children's University Hospital, Marrakech, Morocco.
2. Department of Pediatric Surgery, Children's University Hospital, Marrakech, Morocco.

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Abstract

Purpose: Our study aims to investigate the epidemiological, clinical, biological, therapeutic and evolutionary profile of pleurisy in children.

Materials and methods: A retrospective study was conducted on 245 cases of pleurisy who were seen from 2008 to 2023 in the pediatric department of the university hospital center of Marrakesh.

Results: Pleurisy represent 1.4% of hospitalized cases. Boys were the most affected. The average age was 7.8 years. 75.5% of the patients we treated were vaccinated, and the history of tuberculosis infection was present in 18.36% of patients. Functional signs were represented by fever in 88.5% (217 cases), dry cough in 50.2% (123 cases) and productive cough in 22.8% (56 cases), dyspnea in 66.5% (163 cases) and chest pain in 66.12% (162 cases). A chest X-ray was performed in all patients showing pleurisy of high abundance in 30.6% (78 cases), medium abundance in 46.1% (113 cases) and low abundance in 22% (54 cases). Pleurisy was associated with a pulmonary focus in 37 cases (15.1%). A chest ultrasound was performed in 193 cases (78.77%) with the aim of identifying and eliminating a hydatid cyst before puncturing. Pleural puncture was performed in 177 patients. The etiologies were dominated by purulent pleurisy representing 66.5%, tuberculous causes 29.8% and 3.7% were of malignant origin. The treatment has two components: an etiological component and a symptomatic component. The evolution of pleurisy is generally good.

Conclusion : Pleurisy is a pathology that is common in our environment of poor functional prognosis, necessitating early treatment.

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Introduction:-

Pleurisy is a syndrome whose clinical diagnosis is not problematic but whose etiology can occasionally be elusive. Thus, a number of paraclinical tests may be performed, reported in every instance by chest imaging to pinpoint the existence of the liquid effusion. Sometimes, advances in imaging are beneficial. Pleural puncture plays a significant role in both diagnosis and treatment. A significant role in the etiological examinations' contribution to the certainty of the diagnosis is played by the histological analysis of the pleura [1]. In this article, we examine the effects of preventive and therapeutic advancements on the incidence of pleurisy in children, as well as studying their clinical, paraclinical and etiological profile.

Corresponding Author:- Kaoutar Abidi

Address:- Department of Pediatrics, Children's University Hospital, Marrakech, Morocco.

Methods:-

This is a single-center descriptive and retrospective cross-sectional study, which concerned 245 children admitted to the pediatric department A at the university hospital center Mohammed VI of Marrakech for pleurisy, over a period of 15 years, between January 2008 and January 2023. The goals of our research are to study the epidemiological, clinical, biological, therapeutic and evolutionary profile of pleurisy in children. Any child with pleurisy admitted to the pediatric department A was included in the data collection. Every patient admitted for a respiratory symptom and in whom the clinical examination found a pleural effusion was included in our study. Thoracic radiography was routinely requested, followed by a pleural puncture when it was feasible, in cases where the Ellis-Damoiseau line was not visible, a complement by thoracic ultrasound was carried out in order to eliminate a hydatid cyst. All pleural fluids were systematically studied, including cyto bacteriology with biochemistry, specialized cytology and an Xpert study. Any pleurisy in significant abundance or in patients presenting clinical intolerance required thoracic drainage. In addition to respiratory physiotherapy, special care was based on the etiology.

Results:-

Boys made up 60.4% of cases, making them the most affected (148 cases). The typical age was seven years and eight months (from 1 month to 17 years). 70.2% of the affected children were between the ages of 5 and 15. Among patients, 57.9% were from rural areas. From October to March, we noticed an increase in the number of cases. In this time frame, we documented 57.14% of all instances. The low socio-economic level was noted in 59% of cases. According to the national immunization program, 75.5% of the patients we treated were vaccinated.

The history of tuberculosis infection was present in 18.36% of patients (45 cases). There was an average of 20.1 days between the onset of symptoms and admission to the hospital. Functional signs were represented by fever in 88.5% (217 cases), dry cough in 50.2% (123 cases) and productive cough in 22.8% (56 cases), dyspnea in 66.5% (163 cases) and chest pain in 66.12% (162 cases), night sweats in 20% (49 cases), and general condition deterioration in 48.9% (120 cases). [Figure 1]

A fluid effusion syndrome was found in 91.4% (224 cases) predominant on the right, with the presence of crackling rales in 21.6%, snoring in 0.81%, presence of signs of respiratory distress in 13.46% and lenticular cervical adenopathies in 18 cases, axillary one case and 4 cases presented magmas of adenopathies.

A chest X-ray was performed in all patients showing pleurisy of high abundance in 30.6% (78 cases), medium abundance in 46.1% (113 cases) and low abundance in 22% (54 cases). Pleurisy was associated with a pulmonary focus in 37 cases (15.1%).

Complications were noted in 13 cases (encystment in 8 cases and pachypleuritis in 5 cases) A chest ultrasound was performed in 193 cases (78.77%) with the aim of identifying and eliminating a hydatid cyst before puncturing. The pleural puncture was made in 177 patients (72.24%), the appearance was clear in 1 case (0.56%), citrine yellow in 41.8%, purulent in 45.19% and hematic in 12, 99%. The pleural fluid was exudative in all cases. The polymorphonuclear neutrophil predominance was in 54.23%, and lymphocyte in 45.76%. A germ was isolated in 36 cases (pneumococcus in 12, alpha hemolytic streptococcus in 10, staphylococcus in 5, pseudomonas in 3, klebsiella pneumoniae in 3, L enterobacter cloacae in 2, and acinetobacter in 1), and the culture was sterile in 85% of the cases. [Figure 2]

Chest CT was performed in 38 patients for diagnostic purposes.

The genexpert in the pleural fluid was performed in 43 patients, and all results were negative. Specialized cytology was performed in 52 instances, identifying PNN in 28.8% of cases, lymphocyte in 57.69% of cases, and lymphoblastic infiltrates in 13.46% of cases (7 cases).

BK sputum testing was done in 28.5% of which 4 cases were positive, IDR to tuberculin in 64 instances (20 cases were positive) In 15 individuals, a pleural biopsy was carried out (tuberculosis in 5 cases and lymphoma in 5 cases)

Additional evaluations included an infectious assessment that revealed hyperleukocytosis in 81.6% of patients and an average CRP of 112.35 mg/l, a blood culture requested in 29 cases that was positive in 11 patients and showed staphylococcus aureus in 4 cases, coagulase-negative staphylococcus in 2 cases, alpha hemolytic streptococcus in 2

cases, multi-resistant pneumococcus in 1 case, and salmonella SPP in one case, Rapid HIV test was done in 9 patients, all were negative.

The etiologies were dominated by purulent pleurisy representing 66.5%, tuberculous causes 29.8% and only 3.7% were of malignant origin (lymphoma). [Figure: 3]

The focus of treatment is mostly etiological; antibiologic treatment was started for patients with proven tuberculosis using the 2RHZ /4 RH protocols, Ethambutol was added in cases where the child is infected with HIV or if his weight exceeds 25 kg.

Amoxicillin clavulanic acid was the first antibiotic used to treat purulent pleurisy in 79% of cases, followed by dual therapy (ceftriaxone and gentamycin) in 9.8%, ceftriaxone monotherapy in 7.5%, and triple therapy in 6 instances. 55 patients had thoracic drainage, which lasted an average of 5.5 days (1 to 15 days). In 46.5% of cases, respiratory physiotherapy was used.

The average time for clinical evolution as measured by the onset of apyrexia and absence of functional symptoms was 4 days (1–12 days), and the average time for radiological improvement was 21 days (7 days to 3 months).

Discussion:-

Pleurisy is defined by the existence of a liquid effusion in the pleural cavity, due to the difficulty in making an aetiological diagnosis, pleurisy poses a concerning situation [2]. Of a total of 16,719 children hospitalized in pediatrics A during our study period, pleurisy accounted for 1.46%. Hospital studies conducted in Africa have revealed prevalence rates of 0.7% in Burkina Faso, in Senegal, a prevalence of 0.8% was found, according to the Ndiaye study conducted at the Dakar University Hospital [3].

In our series, the M/F sex ratio was 1.56 with an average age of 7.4 years. This male predominance is comparable to data from the literature in Africa and Europe, but the average age found is very high compared to what has been reported by several authors such as Koueta and al (4.5 years) [3.4.5.6]

Due to limited access to health care and likely a lack of knowledge of fundamental prevention behaviors, families from poor socioeconomic backgrounds have been overrepresented in this study.

According to the national immunization program, 75.5% of the patients had received all of their recommended vaccinations, as reported by Kouéta [6] (98%); this vaccine coverage may have a protective effect against pathogens including Koch's bacillus (BK), Haemophilus influenzae, and pneumococcus.

The functional and general manifestations present at admission were dominated by fever in 88.5%, cough in 73% of cases, dyspnea in 66.5%, chest pain in 66.1%, these outcomes are reasonably similar to those that Idrissa and al. and Arancibia and al. reported [3.7]. Due to pain, discomfort, or hypoxemia, the patient may appear dyspneic and frightened during a physical examination. The only initial sign of pleurisy during the early stages may be a pleural rub. The earliest and easiest imaging technique for determining the etiology of pleural effusion in children is chest radiography. It is the cheapest method for confirming the presence of a pleural effusion [1]. Ultrasonography, which is a simple method to identify the characteristics of the effusion, is the next step in a proper assessment of pleural effusion in children. This tool makes it simple to distinguish between loculated and free pleural effusions as well as between effusion and thickening and solid masses. Further parenchymal abnormalities were identified using computed tomography (CT) scanning for a more accurate assessment of the effusion, in complex situations, especially those involving empyema, this technology appears to be highly helpful [1.8].

In our study the etiologies were dominated by purulent pleurisy representing 66.5%, this cause represents 5 to 10% in children with bacterial pneumonia and 86% in children with necrotizing pneumonia [9], according to the findings, Streptococcus pneumoniae in particular dominated the bacterial profile of purulent pleuresies. These results were comparable to those from studies by Garba M and al [10], Zeriouel, and Thiami L and al. [11] as well. A germ was only detected in 36% of the 239 observations of infectious childhood pleuropneumopathies in France, according to a retrospective multicenter investigation, pneumococcus alone appeared in 80%, streptococcus in 10% and staphylococcus in 6% [12]. Another retrospective investigation of 128 instances with purulent pleurisy reveals germ isolation in 27 cases (25%), represented by the pneumococcus in 12% of cases, streptococcus in 7% of cases, Gram-

negative bacteria in 4% of cases, and Pseudomonas aeruginosa in 2% of cases [12], These findings are comparable to those in our study. A child's bacterial diagnosis is crucial, it allows for epidemiological monitoring and directs antibiotic therapy [11].

The treatment of pleurisy has three components: the complete evacuation of the liquid, respiratory physiotherapy and etiological treatment.

Regarding the molecule selected for empirical antibiotic treatment in the absence of clinical symptoms of severity, no agreement could be reached. 20% of experts still support prescribing a third generation cephalosporin. According to the research, which demonstrates cefotaxime's superiority over ceftriaxone in permeating the pleura in the context of inflammatory exudate, cefotaxime is chosen. Although 80% of specialists concur that amoxicillin should be prescribed, only 52% link it to clavulanic acid [14].

In our situation, and concerning tuberculous pleurisy, the national tuberculosis program's recommendations serve as the basis for the therapeutic regimens used to treat tuberculous pleurisy. Two antituberculosis treatment plans—2RHZ/4RH and 2RHZE/4RH. When it comes to drainage, poor clinical tolerance is the only official indication for effusion evacuation [15]. Respiratory physiotherapy was used in 46.5% of cases, In an interesting investigation, 93 instances of pleurisy who had received physiotherapy were all controlled in terms of respiratory function, and the effectiveness of respiratory kinotherapy has been established [16]. The evolution of pleurisy is generally good

Conclusion:-

According to this study, children's purulent pleurisy continues to be a common cause of hospitalization. Good ENT and bronchopulmonary infection treatment and pneumococcal immunization were key components in preventing purulent and tuberculous pleurisy. The second most common cause of pleurisy in our context, after purulent pleurisy, is tubercular cause. Malignant origin must also be excluded out by specialized cytology, especially in cases of lymphocytic pleurisy. Regardless of these findings, we think prospective multicenter studies should be carried out to have nationally representative frequency and distribution.

Figure 1:- Table of functional signs of pleurisy.

Functional signs	Number of cases	Percentage
Fever	217	88,5%
Dry cough	123	50,2%
Productive cough	56	22,8%
Dyspnea	163	66,5%
Chest pain	162	66,12%
Change in general condition	120	48,9%
Night sweats	49	20%

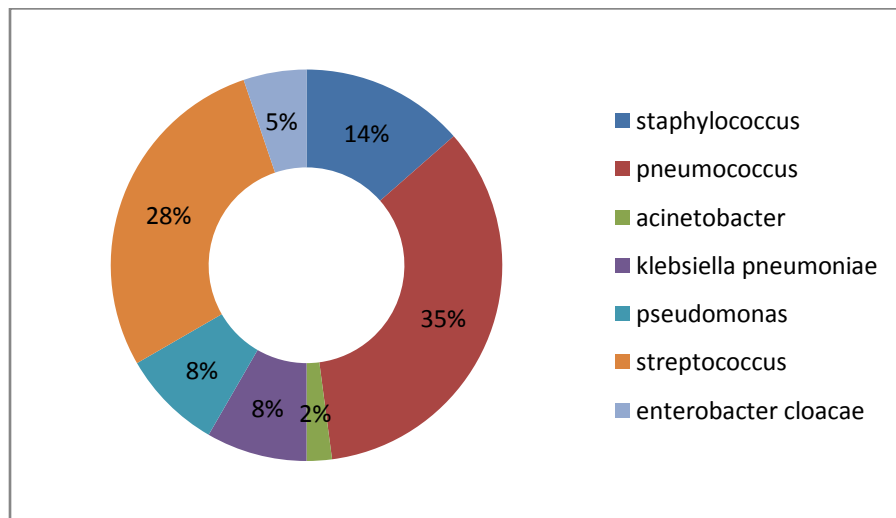


Figure 2:- Distribution of germs found on culture of pleural fluid.

Conflict Of Interest

None.

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