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Radiographic Aspects Of Lung Disease During Hiv Infection, Pediatrics At Cnhu / Hkm Cotonou

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ABSTRACT:

Objective: To study the radiographic aspects of lung infections in children with HIV in pediatrics at CNHU Cotonou.

Patients and methods: The study took place in the medical imaging department and the pediatric ward of CNHU / HKM Cotonou. He acted in a cross-sectional descriptive study retrospective collection which ran from 1 January 2003 to 31 December 2012. The data collection was to take the information from patient records; and proofreading radiographs by two radiologists.

Results: The study population consists of 56 children, of which 55.4% boys and 44.6% girls. Children age between 1 year and 6 years old accounted for 46.4%. Only 26.8% of children showed no immune deficiency. Radiographically, the lesions were bilateral in 57.2% of cases. Bronchial syndrome accounted for 42.7% of cases followed by alveolar syndrome with 31.7% of cases. The lesions were scattered in subjects with moderate and severe immune deficiency. It was the same in cases of pneumocystis pneumonia and tuberculosis. We observed a discrepancy between the diagnostic hypotheses and diagnostics retained after completion of the chest radiograph (P = 0.000). Bronchitis and pneumonia were the most common radiographic diagnostic hypotheses with 45% and 33% respectively .The banal germs pneumonia (37.5%), bronchitis (30.3%), Pneumocystis carinii pneumonia (16.1%) and tuberculosis (14.3%).

Conclusion: In the majority of cases, chest X-ray to reframe the final diagnosis. In front of pneumonia in children infected with HIV, we should strive to eliminate in the first place, diagnostics such as bacterial pneumonia, Pneumocystis carinii pneumonia and tuberculosis.

Keywords: Children, AIDS, HIV, chest radiography, pneumonia, bronchitis, pneumocystis.

INTRODUCTION

AIDS has become a global pandemic with more than 34 million people living with HIV at the end of 2011 [1] .According to estimates, 330 000 new children are infected with HIV each year more than 90% Sub-Saharan Africa [1]. In Benin in 2012, the number of children (0-15 years) living with HIV was estimated at more than 6406 of which only 2,635 children receive antiretroviral treatment [2]. Immunosuppression promotes the increase of benign bacterial infections and the gradual emergence of opportunistic infections [1,2] .In place of these opportunistic infections include tuberculosis, pneumocystis pneumonia, cytomegalovirus infection. The lung disease are at more than 80% of HIV-positive children, one of the major causes of morbidity and mortality. [3] The diagnosis of diseases occupies a place in the management and requires the completion of a chest X-ray, imaging more accessible means in our context.

Unlike adults living with HIV in HIV-positive children, few studies have been conducted on radiographically .No earlier

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study conducted in Benin was found. It seemed important to meet the radiographic features of pulmonary infections in children infected with HIV in Benin, to help improve the care both diagnostic and therapeutic.

PATIENTS AND METHODS

This was a descriptive cross-sectional retrospective study to Collette. It covered a period of 9 years, du1er January 2003 to 31 December 2012 and was conducted in the services of Medical Imaging and Pediatrics of the University Hospital Centre National koutoukou Hubert Maga (CNHU / HKM) in Cotonou.

The exhaustive sampling included 56 HIV positive children. We included in our study all the children who had a positive HIV serology, and had a pulmonary disease diagnosis retained in the medical observation, and who had a chest X-ray initial snapshot.

Those presented with comorbidity with HIV (sickle cell anemia, heart disease, diabetes), those whose files were incomplete and those with images of poor quality were excluded. We used hospitalizations Records Pediatrics services, medical records and recounts sheets developed for this purpose.

Chest x-rays found in the files have all been re-interpreted by two radiologists. Alveolar syndrome, interstitial syndrome, pleural syndrome, bronchial syndrome, miliary lesions, mediastinal and hilar lymphadenopathy were sought lesions. These lesions could be found both in the banal germ pneumonia, tuberculosis and Pneumocystis carinii pneumonia. Seat, unilateral or bilateral location, laterality, or systematized the diffuse nature were analyzed. The final diagnosis was made based on clinical, chest radiography, biology and evolution under treatment. The variables studied were age, sex, immunological stage as the CD4 count. A rate <350 was rated severe, a rate of between 350 and 500 rated moderate, and above 500 considered no deficit. The type of lung disease held by doctors after clinical examination and radiographic features were also studied. The concordance between the clinical and radiological diagnosis and the association between variables was determined by their intersection with the Pearson chi-square test with a 5% significance level and a confidence interval calculated at 95%.

The processing and analysis of data obtained were done using software Epi Data 3.1 and SPSS 17.0.

RESULTS

Socio demographic and epidemiological characteristics

Age Distribution

The median age of children was 6 years 8 months with extremes between 5 months and 13 years. Children whose age was between 1 and 6 years represent 46.4% of the study population (Table 1)

Table I: Breakdown by age groups.

Age	Frequency	Percent
<1 year	6	10.7
[1 to 3 years[	13	23.2
[3 to 6 years[	13	23.2
[6 to 9 years [	9	16.1
≥ 9 years	15	26.8
Total	56	100

Sex Distribution

The male was predominant quietly with a sex ratio = 1.24.

Distribution of patients according to the immunological stage

All children were positive for HIV-1, there was no HIV-2 or HIV-2 and HIV-1 co-infection.

The distribution of the study based on the immunological stage population is reported in Figure 1.

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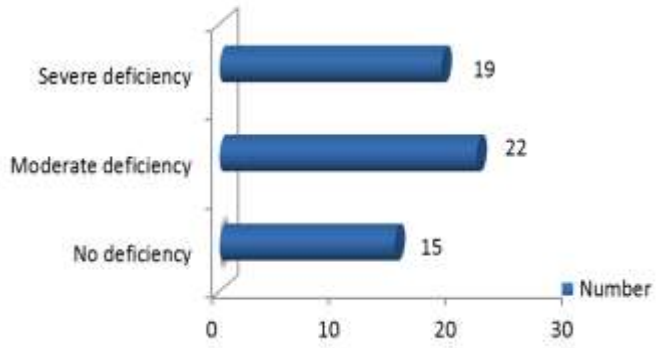

Figure 1: Distribution of patients according to CD4 count

Fifteen children (26.8%) had no immunological deficit

Assumptions Diagnostic Clinics

The diagnostic possibilities mentioned before radiography were dominated by banal pneumonia germs. Some children had two diagnostic hypotheses, one main and one differential. (Table 2).

Table II: Assumptions before clinical diagnostic radiography.

Assumptions Diagnostics before radiography		
	Frequency	**Percent**
Ordinary pneumonia germs	30	53.6
Bronchitis	15	26.8
Tuberculosis	7	12.5
pneumocystosis	4	7.1
bronchiolitis	2	3.5
Staphylococcal lung pleura	2	3.5

Radiological aspects

completion of the first CXR times

The average time between the onset of symptoms and the embodiment of the chest X-ray was 22 days with a range of 1 to 120 days.

Distribution by the laterality of the lesion

Bilateral lesions were predominant in 63%. (Figure 4.5)

The left lung was radiologically most affected in case of unilateral localization.

Distribution by dissemination of lesions

Localized lesions were most common, accounting for 59% against 41% for diffuse lesions.

Distribution by type of injury

Bronchial opacities 42.7% followed by the alveolar and pleural syndrome (Figure 2)

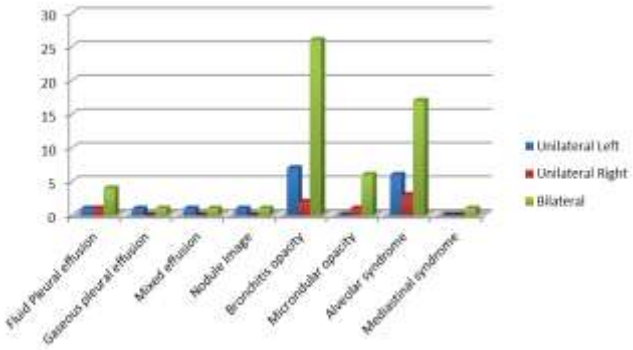

Figure 2: Distribution of patients according to the type of injury

Distribution of patients according to the radiological diagnosis

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Key retained radiological diagnoses were pneumonia, bronchitis, pneumocystis pneumonia and tuberculosis. Table III)

Table III: Radiological Diagnostics

Pathologies	Frequency	Percent (n=56)
Ordinary pneumonia germs	21	37.5
Bronchitis	17	30.3
pneumocystosis	9	16.1
Tuberculosis	8	14.3
Staphylococcal lung pleura	1	1.8
Total	56	100.0

Distributions of diagnoses by type of injury

Several types of lesions (mediastinal syndrome, micronodule, pleural syndrome, alveolar syndrome) could characterize pneumonia, Pneumocystis pneumonia or tuberculosis. (FIG 3,4,5,6,7)

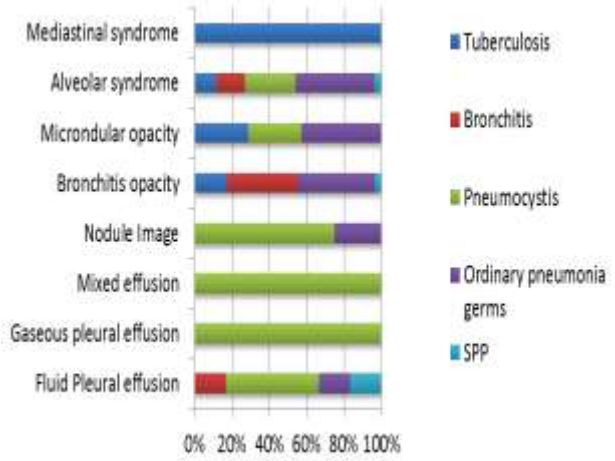

Figure 3: Diagnostics according to the type of radiological lesions

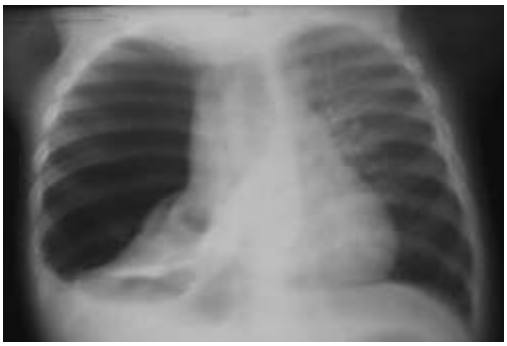

Figure 4: Right massive pneumothorax with An excavation at the stump of collapsed lung

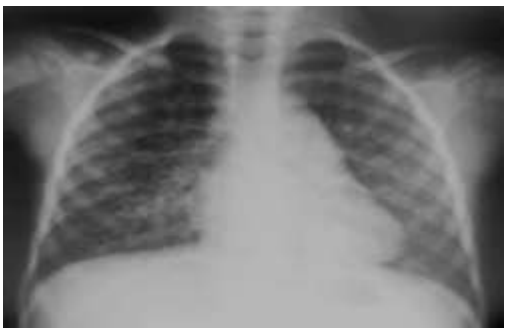

Figure 5: bronchial syndrome predominant right

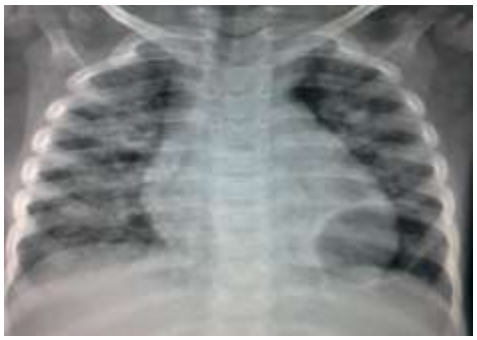

Figure 6: bilateral bronchial syndrome

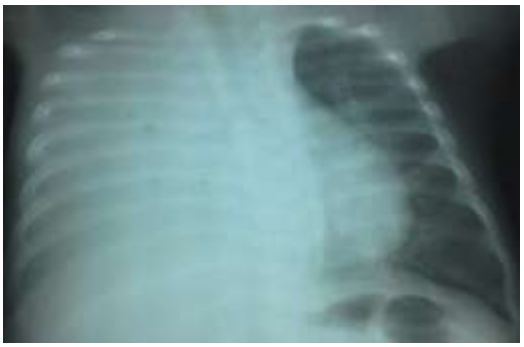

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Figure 7: opacity of the entire right hemithorax Repressing the mediastinum to the left witness abundant pleurisy

Correlation between clinical diagnoses and radiological diagnostics.

In the case of pneumonia type of tuberculosis, bronchitis and pneumonia, radiography has contributed to the improvement of clinical diagnosis (p = 0.000).(Table 4)

Table IV: Concordance between clinical diagnoses and radiological diagnostics

clinical diagnostics		**Diagnoses suggested by radiography**		**Sensitivity**
		Yes (%)	**No (%)**	
ordinary pneumonia germs				
	Yes (%)	19 (63.3)	11 (36.7)	0.000
	No (%)	2 (7.7)	24 (92.3)	
Bronchitis				
	Yes (%)	15 (100)	0 (00)	0.000
	No (%)	2 (4.8)	39 (95.2)	
Tuberculosis	**Yes** (%)	5 (71.5)	2 (28.5)	0.000
	No (%)	3 (6.2)	46 (93.8)	
pneumocystosis	Yes (%)	2 (50)	2 (50)	
	No (%)	7 (13.5)	45 (86.5)	0.055
SPP*				
	Yes (%)	0 (00)	2 (100)	0.846
	Non (%)	1 (1.8)	53 (98.2)	

Distribution of radiological aspects in Function of Socio-demographic characteristics of children.

Distribution of the laterality of lung injury by age

The age ranges of between 1 and 6 years were those with more bilateral lung injury.

Distribution of the laterality of lung injury by immunological stage Patients with immune deficiency are much more bilateral pulmonary involvement.

*Distribution by injuries and immunological status*Patients with immune deficiency had more lung injury, and they dominated region perihilar.

DISCUSSION

In carrying out this work, we encountered several difficulties. Poor record retention, responsible for their loss; Some found incomplete records, the chest X-ray images of poor qualité.Ces different hazards have significantly reduced our workforce.

The median age of patients was 6 years 8 months. Unlike AMIDOU et al who found themselves in 2005 in Cotonou a younger age of 4 years 4 months. [4] Indeed HIV infection diagnosis has become increasingly early because of routine screening in mothers or newborns. CISSE et al in 1995 found themselves in Abidjan a prevalence of pulmonary involvement (59%) in children ranging in age from 0 to 4 years [5]. In our study this predominance (27%) were in children whose age was over 9 years. Based on these observations, our patients are generally older. This globally shows the progress made on the extension of the life

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expectancy of children with HIV because, firstly, systematic screening and secondly, adequate care of these infected children.

The male was predominant. These results are consistent with those of AMIDOU et al and CISSE et al who found a predominance of infections in male patients [4,5]. By cons, MABIALA et al found themselves a sex ratio of 0.97 [6] .It was however established that the male subjects were generally more susceptible to infections because the gene for protection against infection is found on chromosome X [7]

In biological terms, the HIV-1 was the only type encountered (100%). This is consistent with several studies in the sub-region. FLA et al had found 99% of HIV-1 [8] and BOGNINOU 96% [9]. The majority had an immunological deficit (73.2%). This finding is superimposed on that of AMIDOU et al who obtained 75% [4] .These results are explained by the fact that the alteration of pulmonary defense mechanisms caused by HIV infection exposes more children . So he readily develops lung diseases especially as his immune system was still immature before HIV infection.

Among the clinical diagnoses selected by the chest radiography, bacterial pneumonia (37.5%) represented the first etiology of lung diseases. This percentage is the same as Muganga 37% [10]. AKONO et al found themselves as well as bacterial pneumonia first etiology of lung disease [11]. PCP was in second place (16.1%)]. Unlike us, other studies have relegated to the third plan PCP lung diseases in children [12,13]. Indeed, several authors have not recovered from Pneumocystis pneumonia in children infected with HIV [10,14, 15] This is explained partly by the sometimes insufficient technical platform for the diagnosis of this condition (bronchoalveolar lavage alveolar, trans-bronchial biopsy) and secondly, the low prevalence of Pneumocystis jirovecii in the African environment [2] and also through prevention with cotrimoxazole [16].

Tuberculosis (14.3%) ranked third in our study. Clinical studies Muganga (31.4%) of AKONO (16%) and many other authors ranked second as tuberculosis etiology of lung disease in HIV-positive children [10, 11, 14, 15]. However we can not say that tuberculosis is less frequent in Benin.

The patients in our study had much more bilateral involvement (57%). MABIALA had found the same prevalence (54.9%) in Congo. [6] These bilateral pulmonary involvement illustrate the susceptibility of children with HIV to more easily respiratory infections because their immune system is weakened. In order of importance we found bronchial disorders (42.7%) followed by the alveolar syndrome (31.7%) and pleural damage (12.4%). Interstitial syndrome and mediastinal nodes were the least experienced injuries. FLA Koueta et al [8] reported the same results, apart from interstitial syndrome well represented in the series. In our study the interstitial syndrome (miliary) was more related cases of tuberculosis, Pneumocystis pneumonia and banal pneumonia germs.

Alveolar syndrome characterized most often bacterial pneumonia. AKONO et al. [11] made the same observation. In tuberculosis, there is an association of lesions with a predominance of bronchial disorders (45), alveolar syndrome (27), and miliary (18). Mediastinal and pleural attacks were the least experienced. MABIALA et al. [6] with 97.5% of parenchymal lesions, our results corroborated, with a small proportion of violations mediastinal and pleural. M'PEMBA [17] has been an important part of bronchial and alveolar damage. Lesions type miliary were smaller.

As against France, LACOMBE et al [18] showed that the miliary parenchymal and mediastinal attacks were higher in tuberculosis in HIV infection. This is explained by the fact that the weakening of the immune system lead to a reduction in the inflammatory response, and therefore a reduction of the possibility of formation of an inflammatory granuloma where the atypical expression.

The presence of pneumothorax during PCP in our study is not an isolated event. Many authors such as SOLOMON, ALTER, had in their series [19,20]. We noted atypical nodular images in PCP. TAKUYA et al and Sato et al in 2013 in Japan had also discovered [12,13]. Given these results, considering that the occurrence of PCP is the stage of profound immunosuppression, it is not excluded that other lung diseases by combining their different radiographic aspects are behind the appearance of these atypical pictures in PCP.

There is a difference between clinical diagnostic hypotheses and radiological diagnostics; this was important in cases of tuberculosis, bacterial pneumonia and bronchitis (P = 0.000). This finding would mean that the realization of chest radiography in children infected with HIV could clarify the lesion diagnosis. AMON-TANOH et al as other authors have found that the use of radiography was essential for the diagnosis of lung disease in these children [6,11,19,21]. Indeed, in certain diseases such as tuberculosis, bacteriology and TST are often negative despite the presence of pulmonary symptoms. This position is shared by YOUSSOUFA. et al [22] and DU PLESSIS et al. [23] These authors had discovered radiological abnormalities in children with HIV infection presenting no pulmonary symptoms.

It appears from this study that should be made to eliminate certain diseases such as bacterial pneumonia, Pneumocystis

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carinii pneumonia and tuberculosis in children infected with HIV before certain aspects of the chest X-ray. [21] The diagnostic hypotheses can not be given in view of the radiograph by knowing the clinical context.

CONCLUSION

The lesions found on radiographs were dominated by bronchial attacks, followed by alveolar syndrome and pleural damage. Interstitial syndrome and mediastinal nodes were the least experienced injuries. In most cases, chest radiography allowed to crop the final diagnosis.

Diseases such as bacterial pneumonia, bronchitis, pneumocystis pneumonia and tuberculosis remain major diagnoses in children infected with HIV in Cotonou.

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