

Paraclinical, Therapeutic and Evolutionary Profile of Osteoarticular Tuberculosis: A Report about 550 Cases in Abidjan

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Abstract

Objective: To describe paraclinical, therapeutic and evolutionary aspects of osteoarticular tuberculosis in Abidjan. **Materials and Method:** We realized a descriptive retrospective study carried out in the Rheumatology Department of the University Hospital Center of Cocody in Abidjan about 550 patients over a period of 10 years from January 2004 to December 2013. The paraclinical, therapeutic and evolutionary data had interested us. **Results:** Osteoarticular tuberculosis represented 12.13% of 4531 rheumatic diseases identified during the study period. The tuberculin skin test was positive in 78.49% of cases. An inflammatory syndrome was present with erythrocyte sedimentation rate and C-reactive protein respectively into 69.45% and 76.54% of cases. The research of *Mycobacterium tuberculosis* was realized into 176 of cases which 50% was positive. Polymerase chain reaction and biopsy of tissue were performed respectively in 8 and 6 cases. Plain radiography (89.82%) and computed tomography (83.63%) were the most realized imaging. Computed tomography has contributed for the diagnostic in 99.78% of cases. The majority of our patients (82.91%) received anti-tuberculous treatment which consisted of two months of combination of rifampicin (R), isoniazid (H), pyrazinamide (Z) and Ethambutol (E) (2RHZE), followed by 10 months of rifampicin (R) and isoniazid (H) (10 RH). The outcome in patients on this treatment was favorable in 528 cases (96%). **Conclusion:** This study revealed that the research of *Mycobacterium tuberculosis* was often realized and positive. On the contrary, polymerase chain reaction and biopsy of tissue were rarely performed. The main imaging is computed tomography. Our protocol

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of treatment is effective.

Keywords

Osteoarticular Tuberculosis, Biology, Imaging, Abidjan

1. Introduction

Africa alone has 31% of cases of tuberculosis [1]. In Côte d'Ivoire, according to World Health Organisation, the incidence of tuberculosis was 104 cases per 100,000 populations in 2012 [2]. Osteoarticular tuberculosis (OAT) represents 2% to 5% of all tuberculosis [3] [4]. As all tuberculosis, OAT appears most often in areas that are poor and disadvantaged. It results from the hematogenous spread of *Mycobacterium tuberculosis* from a primitive visceral home, usually lung [5]. The main location of OAT is the spine which represents about 50% of cases [4] [6]-[8]. It is subdivided in 4 presentations: spinal tuberculosis (50%), osteitis and arthritis or arthritis (30%), osteitis or osteomyelitis (19%) and tenosynovitis and bursitis (1%) [9]. The main clinical manifestations are rather inflammatory pain associated with spinal stiffness or joint swelling disabling with chronic evolution in a context of fever, poor general condition and night sweats. The diagnosis of certainty is made histologically and bacteriologically. Given the difficulty in establishing the diagnosis of certainty in our context (insufficiency of technical facilities), presumptive diagnosis becomes important in accordance with the work of Eti *et al.* [10]. It is based on a body of epidemiological and clinical evidence, but also on biological, radiological and especially evolutionary evidence. The objective of this study was to describe paraclinical, therapeutic and evolutionary aspects of osteoarticular tuberculosis (OAT) in our context.

2. Patients and Method

It was a descriptive retrospective study carried out in the rheumatology department of the University Hospital Center of Cocody in Abidjan over a period of 10 years from January 2004 to December 2013. All records of patients in whom the diagnosis of OAT was selected were included. The records of patients without imaging were not selected. The diagnosis of OAT was either a diagnosis of certainty or presumptive. We took into account:

- Biological data: guidance exams such as erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and tuberculin skin test and certainty tests including the presence of tuberculosis follicle at the histology of an osteoarticular or visceral tissue and/or the identification of acid-fast bacilli (AFB) in biological fluids.
- Imaging tests: plain radiography, ultrasound, computed tomography (CT) and magnetic resonance imaging (MRI).
- Therapeutic and evolutionary data: anti-tuberculous treatment [association of Rifampicin (R), isoniazid (H), pyrazinamide (Z) and Ethambutol (E)] and the evolution on this treatment. This evolution was assessed on the basis of clinical and paraclinical parameters such as the disappearance of fever, the amendment of the osteoarticular painful symptoms, the improvement of the general condition, the disappearance of the biological inflammatory syndrome and the lack of evolutive lesions in CT or MRI.

3. Results

We included 550 cases of OAT out of 4531 rheumatic diseases identified during the study period, which represented 12.13%. Out of these 550 OAT, we identified 496 cases of Pott's disease (90.18%) and 54 cases of peripheral osteoarticular tuberculosis (9.82%) which are detailed in **Table 1**. Our patient population consisted of 295 males (53.63%) and 255 females (46.37%) that is a sex ratio of 1.15 with a mean age of 43 years (extremes: 4 and 88 years).

Table 2 shows the rate of performance of biological and radiological examinations and positivity rate or contribution to the diagnosis of OAT.

3.1. Biologically

The tuberculin skin test was phlyctenular in 24 patients (12.86%). The research of *Mycobacterium tuberculosis*

Table 1. Peripheral locations of OAT.

Peripheral locations	Number	Percentage
Hip	26	48.14
Knee	14	25.96
Shoulder	1	1.85
Wrist	2	3.70
Ankle	2	3.70
Sacroiliac joint	2	3.70
Sternoclavicular joint	1	1.85
Elbow	2	3.70
Costal arch	1	1.85
Midfoot	2	3.70
Multifocal peripheral locations	1	1.85
Total	54	100

Table 2. Summary of paraclinical examinations.

Paraclinical data	Performance rate		Positivity rate or presence of anomaly	
	Number	Percentage	Number	Percentage
Tuberculin skin test	186	33.81	146	78.49
ESR	550	100	382	69.45
CRP	550	100	421	76.54
Hemoglobin	550	100	234	42.54
Research of <i>Mycobacterium tuberculosis</i>	176	32	90	51.13
Biopsy	08	1.45	06	75
PCR MT	06	1.09	03	50
Plain radiography	494	89.82	248	45.10
CT	460	83.63	459	99.78
MRI	35	6.36	34	97.14

was performed mainly in the sputum (70 patients), gastric tubing fluid (55 patients) and the pus of soft tissue abscess (23 patients). The biopsies performed whose histology helped highlight an epithelio giant cell follicle with caseous necrosis were surgical disco-vertebral (2 cases), synovial (2 cases) and lymph node (2 cases) biopsies.

3.2. At the Imaging Level

CT showed 387 cases of spondylodiscitis, 12 cases of spondylitis, 3 cases of arthritis, 52 cases of osteoarthritis and 5 cases of osteitis. MRI helped to confirm spondylodiscitis in 29 cases, spondylitis in 1 case and osteoarthritis in 4 cases.

Ultrasound performed in 215 cases including 208 abdominopelvic ultrasound revealed deep lymph nodes in 36 cases and peri-lesional soft tissue abscess in 15 cases.

3.3. Therapeutically

Anti-tuberculous treatment instituted in our patients consisted of two months of combination of rifampicin (R),

isoniazid (H), pyrazinamide (Z) and Ethambutol (E) (that is 2/RHZE), followed by 10 months of rifampicin (R) and isoniazid (H) (that is 10 RH) in 456 patients (82.91%). The total duration of treatment was 12 - 18 months. Patients with 18 months of treatment were those who were not cured after 12 months of treatment (94 cases that is 17.09%). Ten patients had surgical intervention (1.82%) including 5 spinal surgical intervention, 3 peripheral joint surgical intervention and 2 deep abscesses draining.

The outcome in patients on anti-tuberculous treatment was favorable in 528 cases (96%), unfavorable with 14 cases of death (2.54%). Eight patients were lost to follow-up.

4. Discussion

This study brought together the largest cohort of OAT ever reported to our knowledge in the literature, that is 550 OAT dominated by 496 cases of Pott's disease (90.18%). The prevalence of Pott's disease in our study was not comparable to that revealed by the literature [4] [6]-[8]. We found in it cohorts of OAT with numbers well below ours [10]-[12]. Our study showed a male predominance as with Mariconda (57.1%) [13]. However most of the authors did not note any predominance of either sex [4]-[14]. In addition to epidemiological and clinical arguments, biological, imaging, therapeutic and evolutionary data have completed our argument in the absence of histological or bacteriological evidence.

4.1. Biologically

The presence of a biological inflammatory syndrome is usual even if the absence does not exclude the diagnosis, as well as the tuberculin skin test. Our study revealed as previous studies carried out in our department that the practice of tissue biopsy followed by histology remained exceptional in the exploration of osteoarticular diseases with a very low implementation rate as in other sub-Saharan countries [10] [15]-[19]. The tissue biopsy remained however systematic in developed countries [20] [21]. It was quite commonly practiced in North Africa [22] [23]. This situation could be explained by the lack of technical equipment resulting from years of military and political crisis in our country since 1990 and that continues until now. The other means of certainty diagnostic remains the highlighting of AFB in biological fluids either in the presence of abscess or an associated visceral involvement (sputum, gastric lavage fluid...). It was carried out in a third of cases in our study and was positive in half the cases. The real alternative to tissue biopsy remains the polymerase chain reaction in search of *Mycobacterium tuberculosis* (PCR MT). This technique that seems new and unknown in sub-Saharan Africa needs to be better known because of its specificity of 92% - 98% [24].

4.2. At the Imaging Level

Radiography is still useful to the radiological diagnosis especially in case of suspicious lesions. It was the most accessible imaging, which could explain its high performance rate in our study. According to Hsu *et al.* [25], it is very useful in diagnosis and can be normal especially at an early stage. It is here that CT takes its value. It has helped specify the lesions in case of suspicious radiographic signs or normal radiographic image. The high performance rate of CT in our study could be explained by the fact that it is a common practice since its cost has fallen by half in the Teaching Hospitals in Abidjan in comparison to private structures. As for MRI, it was very little performed in our study. This latter high-performance and rather new imaging in our context has been the exception, given its exorbitant cost and also the lack of health insurance.

4.3. At the Therapeutic and Evolutionarily Level

Our protocol (2RHZE + 10RH) in force in our context was a test treatment for presumptive diagnosis and the favorable development (96% of cases) on treatment had proved us right. The duration of treatment is different in other countries: 9 months in Teklali *et al.* in Morocco and 8 months in Garcia *et al.* in Spain [26] [27]. Increasingly, the discovery in rheumatology practice of scalable OAT to 6 months should incite to maintain 12 months of treatment as the minimum duration.

5. Conclusion

This study reveals that the diagnosis of OAT in our context is most often presumptive. A biological inflamma-

tory syndrome is always present. The research of *Mycobacterium tuberculosis* is often realized and positive. In the contrary, polymerase chain reaction and biopsy of tissue are rarely performed. Our main imaging is computed tomography. The protocol of treatment we use is effective.

Conflict of Interest

None.

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