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Association Between Bronchopulmonary Cancer and Pulmonary Tuberculosis: A Retrospective Study

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Abstract **Original Research Article**

A retrospective study was conducted in the Department of Pneumology of the Mohamed V Military Training Hospital in Rabat over a period between 2016 and 2019, on all patients with a sequential or concomitant association of pulmonary tuberculosis and primary pulmonary neoplasia. The comparison was made with a control group with pulmonary neoplasia but no pulmonary tuberculosis. 14 cases of tuberculosis and bronchopulmonary cancer were collected during the study period compared to 28 controls. The average incidence was 3.5 new cases/year. The most frequent symptoms were chest pain, dyspnea and cough. General signs were marked by weight loss, anorexia, night sweats and fever. Radiological lesions were unilateral in 88.1% of cases, and bilateral in 11.9% of cases. Tumor lesions were homolateral to tubercular lesions in 85.7% of patients and contralateral in 14.3% of patients. The risk factors for the development of tuberculosis in addition to bronchopulmonary cancer were the presence of associated defects, clinical symptoms such as chest pain and dyspnea, general signs such as night sweats, fever and anorexia, and bilateral radiological localization. Statistically associated prognostic factors were: altered general condition defined by PS>2, CRP > 100 mg/l and the presence of drug interactions. This association prolongs the length of hospital stay, diagnostic and therapeutic delays and increases mortality. The association between tuberculosis and bronchopulmonary cancer poses a problem of diagnosis and drug tolerance. The risk factors are multiple, and the prognosis is marked by an increase in the mortality rate.

Keywords: Bronchopulmonary cancer, pulmonary tuberculosis, association.

INTRODUCTION

The coexistence of pulmonary tuberculosis (TB) and primary bronchopulmonary cancer presents a significant diagnostic and therapeutic challenge, particularly in countries where tuberculosis remains endemic. Both diseases share overlapping clinical and radiological features, often leading to diagnostic confusion and delayed treatment. Furthermore, the interaction between TB and lung cancer is complex, with evidence suggesting a possible bidirectional relationship. Tuberculosis can induce chronic inflammatory changes in the lungs that may contribute to oncogenesis, while cancer-related immunosuppression may facilitate the reactivation of latent TB.

This retrospective study, conducted at the Department of Pneumology, Mohamed V Military Training Hospital in Rabat, sought to evaluate the clinical, radiological, and prognostic characteristics of patients with concomitant or sequential pulmonary tuberculosis and bronchopulmonary cancer. By comparing this cohort to patients with lung cancer without tuberculosis, the study aimed to identify risk factors and assess the impact of this dual pathology on outcomes.

METHODS

A retrospective analysis was performed over a four-year period, from 2016 to 2019, including all patients diagnosed with both pulmonary tuberculosis and primary bronchopulmonary cancer. Cases were defined as patients with either a sequential (TB diagnosed before or after cancer) or simultaneous (both diagnosed around the same time) association of the two diseases.

A control group was selected, comprising patients diagnosed with bronchopulmonary cancer but without any history or evidence of pulmonary tuberculosis. The case group included 14 patients, while

the control group consisted of 28 matched individuals based on age and gender.

Data were collected from patient medical records and included demographic characteristics, clinical presentation, radiological findings, laboratory results, histopathological data, treatment regimens, hospital stay duration, and outcomes. Particular attention was given to identifying clinical and paraclinical factors that could influence prognosis in patients with the dual pathology.

RESULTS

Over the four-year study period, 14 cases of pulmonary tuberculosis associated with bronchopulmonary cancer were identified, yielding an average incidence of 3.5 cases per year. The most frequently reported symptoms were chest pain, dyspnea, and chronic cough. Systemic or constitutional symptoms were also prominent, with patients frequently presenting with weight loss, anorexia, night sweats, and fever features common to both TB and cancer.

Table 1 : Functional and general signs and clinical examination data of the study group and controls

Variables	Association TP et CP (n=14)	Témoins (n=28)	P
Functional signs : §			
Chest pain	10 (71.4%)	10 (35.7%)	0.029
Dyspnea	10 (71/4%)	3 (10.7%)	<0.001
cough	12 (85.7%)	0 (0%)	<0.001
Expectoration	9 (64.3%)	0 (0%)	<0.001
Hémoptysia	4 (28.6%)	3 (10.7%)	0.197
General signs §			
Night sweat	-10 (71.4%)	7 (25%)	0.004
Fever	-9 (64.3%)	-3 (10.7%)	0.001
Weight loss	-12 (85.7%)	-16 (57.1%)	0.089
Anorexia	-12 (85.7%)	-13 (46.4%)	0.014
Clinical examination§			
Tiredness	12 (85.7%)	16 (57.1%)	0.089

Chest imaging revealed unilateral pulmonary lesions in 88.1% of the cases, and bilateral involvement in 11.9%. In the majority of cases (**85.7%**), the tumor was located on the same side (homolateral) as the tuberculous lesion, while 14.3% had contralateral involvement. Radiological overlap contributed to diagnostic delays in several cases.

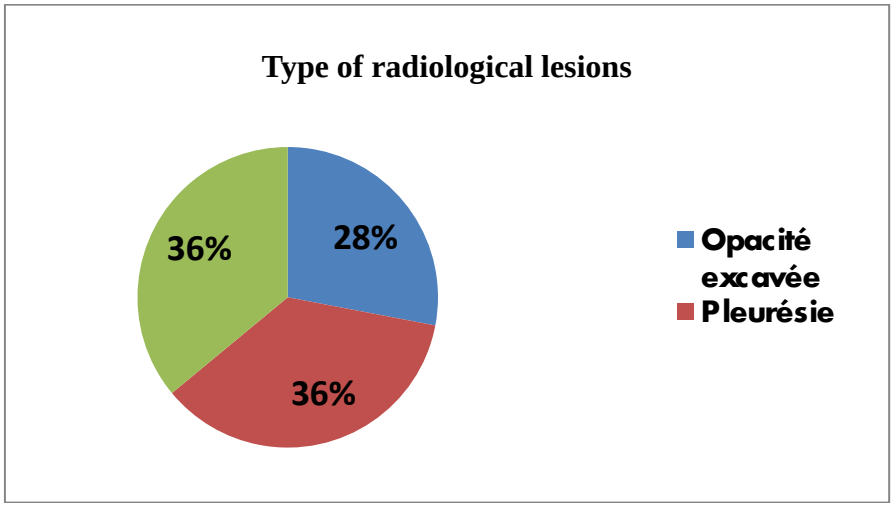

Figure 1 : Distribution of cases according to the type of radiological lesions

Risk Factors and Prognostic Indicators

Several risk factors were found to be more prevalent in the dual pathology group :

- The presence of underlying comorbidities or anatomical defects (e.g., old TB scars, structural lung damage)
- Clinical symptoms such as chest pain and dyspnea
- General symptoms including fever, night sweats, and anorexia
- Bilateral radiological findings, which were associated with worse prognosis

From a statistical standpoint, the following factors were significantly associated with poor outcomes:

- Poor performance status (PS > 2)
- Elevated C-reactive protein (CRP > 100 mg/L)
- Presence of drug interactions, particularly between anti-tubercular drugs and chemotherapy or immunotherapy

These factors were linked to longer hospital stays, delays in diagnosis and initiation of therapy, and a higher mortality rate compared to the control group.

DISCUSSION

The coexistence of pulmonary tuberculosis (TB) and bronchopulmonary cancer remains a rare but clinically significant entity that complicates diagnostic clarity and worsens prognosis. Several epidemiological studies have shown a strong association between prior TB and the development of lung cancer, with meta-analyses indicating that individuals with a history of TB are over twice as likely to develop lung cancer compared to the general population [1]. This association is believed to stem from chronic inflammation, immune dysregulation, and fibrotic scarring within the pulmonary parenchyma, creating a pro-oncogenic environment that supports genetic mutations, cellular proliferation, and tumor development [2,3]. In our cohort, patients often presented with nonspecific respiratory and constitutional symptoms such as cough, weight loss, dyspnea, fever, and anorexia, which are common to both TB and lung cancer and thus contribute to significant diagnostic delays. Radiologically, the diseases also share overlapping features—particularly mass-like lesions, infiltrates, or cavitary changes—complicating early differentiation, especially when both lesions were homolateral or when bilateral involvement was present. This diagnostic ambiguity has been previously reported, with studies highlighting the challenges in distinguishing TB-related lesions from neoplastic processes in patients with atypical clinical courses or in regions where TB is endemic [4,5]. Furthermore, performance status (PS > 2) and elevated inflammatory markers, particularly CRP levels above 100 mg/L, were associated with poorer prognosis in our study, consistent with prior research identifying these as independent predictors of mortality and treatment intolerance in lung cancer patients [6,7]. The inflammatory milieu induced by active TB may not only worsen general condition but also alter the tumor microenvironment, further influencing tumor progression and treatment resistance. In addition, one of the most complex aspects of managing patients with this dual pathology lies in the pharmacological interactions between anti-tubercular therapy (ATT) and oncologic treatments. Rifampicin, a first-line agent in TB treatment, is a potent inducer of cytochrome P450 enzymes, especially CYP3A4, which significantly reduces serum concentrations of several chemotherapeutic agents, tyrosine kinase inhibitors, corticosteroids, and immune checkpoint inhibitors, potentially leading to reduced efficacy and treatment failure [8,9]. Moreover, isoniazid can inhibit certain hepatic enzymes, resulting in variable pharmacokinetics when administered with other agents, further complicating treatment regimens [10]. These interactions can delay treatment initiation, prolong hospital stays, and necessitate dose adjustments or regimen changes that are not always supported by evidence-based guidelines. Mortality in our cohort was higher among patients with the TB–cancer association, reflecting the cumulative burden of disease, immune exhaustion, nutritional depletion, and reduced functional reserve. Similar findings have been reported in other studies where patients with dual pathology had poorer overall survival, increased postoperative complications, and reduced tolerance to systemic therapy [11,12]. From a clinical standpoint, these findings underline the importance of maintaining a high index of suspicion for lung cancer in TB patients with persistent or atypical radiological lesions, particularly when constitutional symptoms fail to resolve despite appropriate ATT. Advanced imaging, early biopsy, and molecular profiling should be considered in ambiguous cases to reduce diagnostic delays. A multidisciplinary approach involving pulmonologists, oncologists, infectious disease specialists, radiologists, and clinical pharmacists is essential for optimal care planning and minimizing drug-related toxicity. In TB-endemic areas, long-term follow-up of TB survivors may be warranted, especially among high-risk populations such as smokers, the elderly, or those with fibrotic sequelae, to enable early detection of malignancy. Ultimately, the coexistence of these two conditions calls for heightened clinical vigilance, robust diagnostic pathways, and tailored therapeutic strategies to improve outcomes in this vulnerable patient population.

CONCLUSION

The association of pulmonary tuberculosis with bronchopulmonary cancer is uncommon but clinically significant. It complicates diagnosis, prolongs treatment timelines, increases the risk of adverse drug interactions, and worsens prognosis. Identifying risk factors such as altered general condition, elevated inflammatory markers, and bilateral radiologic lesions can help stratify patients at higher risk for poor outcomes. Early diagnosis, careful therapeutic planning, and close monitoring are essential to improve survival and quality of care in this vulnerable population.

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