Influence of Age on the Repartition and the Evolution of Extrapulmonary Tuberculosis in the Provinces of Laayoune and Tarfaya, Morocco

N. Ait Ouaaziz[1], A. Arfaoui[2], M. El Bakkali[3], A. Sbayi[4], H. Elkhabbazi[5], J. Amal[6], F. Hamdani[7], A. Soulaymani[8], A.Quyou[9]

[1, 3- 5, 8,-9] Laboratory of Genetics and Biometrics, Kenitra Faculty of sciences, [2] Royal Institute of Management Training, Sale, [6] Department of Infrastructure for Provincial Ambulatory Action, Health ministery delegation, [7] Centre of Diagnosis and Treatment of Respiratory Diseases, Health ministery Delegation, MOROCCO.

[1] aitouaaziz_nabil@hotmail.com

ABSTRACT

This work aims to bring out the epidemiological profile of Extrapulmonary tuberculosis (ETB) in the provinces of Laayoune and Tarfaya (Morocco), and to investigate the influence of age on the repartition and the evolution of the ETB types. It consists in a retrospective study based on 721 cases of ETB reported to the Centre of Diagnosis and Treatment of Respiratory Diseases of Laayoune during the period 2006-2012.

The mean age in our sample is 35.04 ± 16.63 years old, and the median age is 32 years old. The ETB affects particularly the active population whose age is between 20 and 50 years. The male to female sex-ratio is 1.27. The repartition of patients according to the localization of ETB shows a predominance of pleural and ganglionar localizations with 41% and 32% respectively. The analysis of variance reveals that the Extrapulmonary localization is significantly influenced by age. Moreover, the comparison of means leads to three groups according to the age. Indeed, the oldest patients are preferentially affected by intestinal, urogenital or bone ETB. The repartition of ETB patients according to the evolution show that 63% of them finished their treatment and that 21% were transferred to other health structures. Furthermore, we reported that the age is significantly associated with the evolution type. Also, the comparison of means revealed three groups of age; this implies that deaths in our sample occur preferentially in the oldest patients.

In conclusion, more efforts should be showed off to fight more efficiently against this disease that still constitutes a real problem of health in Morocco.

Keywords: tuberculosis, Extrapulmonary, age, repartition, evolution, death

INTRODUCTION

Tuberculosis (TB) is a contagious infectious disease, with 8.6 million new cases per year worldwide in 2012 [1], [2], and an incidence rate varying from less than 10 new cases per 100 000 inhabitant, in some parts of the Americas, in several countries of Western Europe and Japan, Australia and New Zealand to more than 1000 cases per 100 000 inhabitant in South Africa and Swaziland. [2] 1.3 million people have died as a result of tuberculosis, it is the fifth disease related cause of death in the world and the second cause of death from infectious disease among adults [2], [3]. Although the pulmonary form of TB is by far the most common and most dangerous, Extrapulmonary tuberculosis (ETB) begins to interest the authors due to a gradual increase in its incidence.

ETB represents 20% of TB cases worldwide [2]. In Morocco, it accounts for 49% of TB cases with 13,522 cases. [4] In the provinces that this study is concerned with and during the same period, ETB represented 45% with 721 cases [5].

Extrapulmonary TB diseases result from the spread of bacilli from regional lymph lung nodes via the lymphatic and sanguine system, to other ganglia or organs such as the kidneys, the epiphyses of long bones, vertebral bodies, meninges [6]. Extrapulmonary localizations are more common among the young and the elderly; their multiple clinical aspects represent a diagnostic problem for practitioners which require histological examinations (anatomical and pathological) to make compelling arguments for the diagnosis of these forms [6]. The work at hand aims at highlighting the epidemiological profile of ETB in the provinces of Laayoune and Tarfaya (Morocco) on the one hand, and on the other hand studying the influence of age on the distribution and the development of different ETB types.

MATERIAL AND METHODS

This work focused on two provinces in the region of Laayoune-Boujdour-Sakia El Hamra, in particular Laayoune and Tarfaya located on the Atlantic coast. Both provinces had 260,000 inhabitants in 2012 regarding the geographic coordinates, latitude / longitude of Laayoune is 27 ° 09'44 "North / 13 ° 12'11" West, and the Tarfaya is 27 ° 56 '22 "North / 12 ° 55 '34" West.

This work is based on a retrospective study of 721 cases of Extrapulmonary tuberculosis, all types combined, reported to the Centre of Diagnosis and Treatment of Respiratory Diseases (CDTRD) Laayoune for a period of 7 years from January 2006 to December 2012. These cases emanate from the military hospital and various health centers, public pulmonologists, and general practitioners in both provinces.

All criteria of reported cases (age, gender, organ involved, biological and radiological examination and treatment, case status ...) are registered in individual treatment records of patients and in a register in the CDTRD. The source of our study was mainly individual records of patients that are maintained up-to-date. During the study period (2006-2012), we recorded 721 cases of Extrapulmonary TB that were supported and treated at the CDTMR Laayoune.

Regarding the statistical analysis, we used the chi-square test (χ^2) to compare the observed counts when it comes to qualitative variables, and analysis of variance (ANOVA) to compare means between different groups when it comes to quantitative variables. When the ANOVA test is significant, the Duncan test is performed to divide the sample into groups of equal means.

RESULTS

The average age of patients is 35.04 ± 16.63 years, with a median age of 32 years. The sex-ratio male to female, which is 1.27, is highly significant ($F = 10.02$, $p = 0.002$).

At first, we distributed our sample into age groups of 10 years and we have calculated the specific lethality for each age group (Figure 1). The results show that the 20-29 age group is the most affected by Extrapulmonary tuberculosis with a number of 187 cases, followed by that of 30-39 years with 171 cases and that of 40-49 years with 109 cases. This implies that the most active population is the most affected by this disease. Regarding the specific lethality (Figure 1), the maximum is recorded among patients aged 60 years and more.

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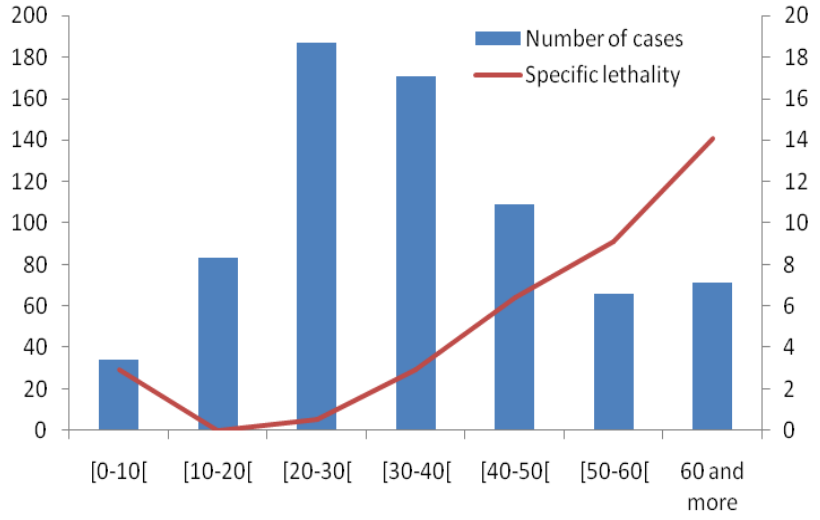

Figure 1. Distribution of patients according to age group and specific lethality

Relationship between the Age of Patients and Localization of Extrapulmonary Tuberculosis

The repartition of patients according to the localization of Extrapulmonary tuberculosis shows a predominance of pleural and ganglionar tuberculosis with 41% and 32% respectively (Figure 2). Extrapulmonary localizations differ significantly in terms of number ($\chi^2 = 789.6$; $p < 0.001$).

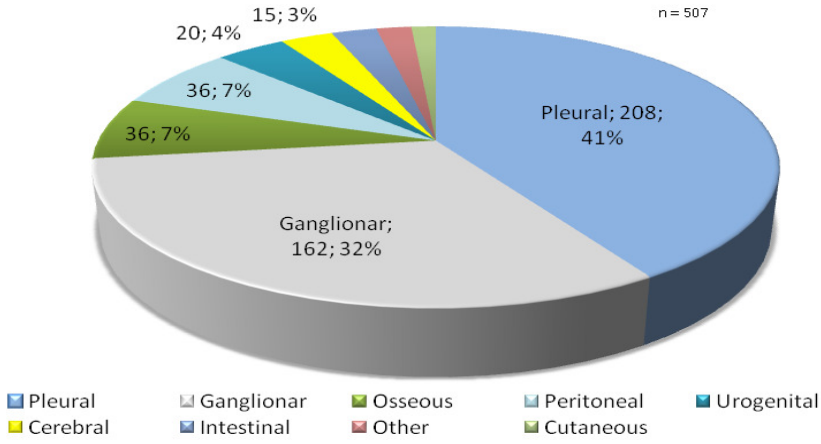

Figure 2. Repartition of patients according to the localization of tuberculosis

In order to investigate the link between age and Extrapulmonary localization, we performed an analysis of variance that showed a highly significant F ratio ($F = 5.67$; $p < 0.001$), implying that the Extrapulmonary localization is strongly influenced by age.

The comparison of means showed the existence of three mean age groups (Figure 3) with averages of 33.2 ± 16, 35 ± 16.5 years and 40.3 ± 14 years respectively. In fact, older patients are preferentially affected by intestinal, urogenital and osseous tuberculosis.

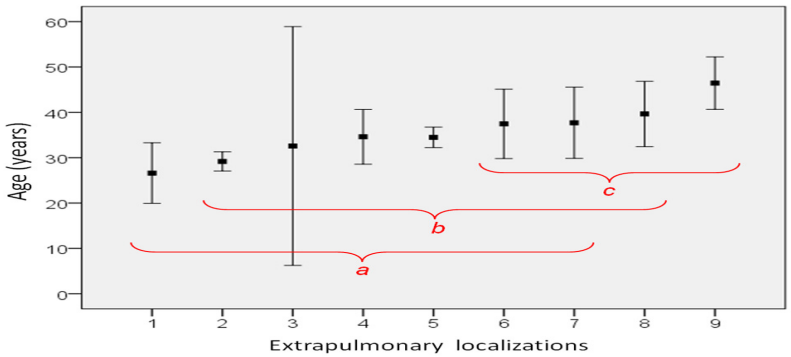

Figure 3. Repartition of Patiens according to the age and the Extrapulmonary localization

(1. Cerebral; 2. Ganglionic; 3. Cutanous; 4. Peritoneal; 5. Pleural; 6. Intestinal; 7. Other; 8. Urogenital; 9. Osseous)

Relationship between the Age and the Evolution of Patients

The repartition of Extrapulmonary tuberculosis according to the evolution shows that the majority of them completed treatment with 454 cases, or 63%. Second, come the transferred cases with 21% (Figure 4). The difference was statistically significant ($\chi^2 = 596.9$; $p < 0.001$).

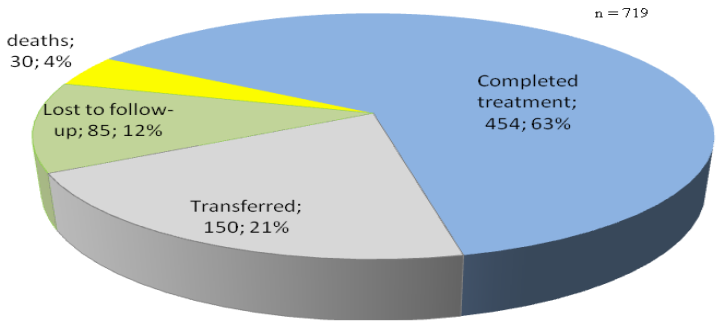

Figure 4. Repartition of patients according to their evolution

The study of the link between the age and the type of evolution by the analysis of variance showed that these two variables are closely related ($F = 10.49$; $p < 0.001$). The comparison of means shows the existence of three groups, the first contains the transferred patients and patients who completed treatment with an average of 33.23 ± 15.92 years, the second group contains these latter in addition to those lost to follow-up with an average of 36.66 ± 16.58 years and the third group includes only dead patients with an average of 48.66 ± 16.08 years. This result implies that the deaths in our sample preferentially affect older people.

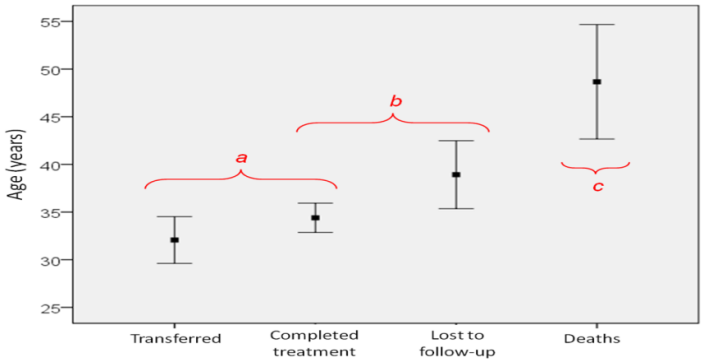

Figure 5. Repartition of patients according to the age and the evolution

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DISCUSSION

This study showed that the average age of ETB patients was 35.04 ± 16.63 years, with a median age of 32 years. These results are comparable to those of Robert [7] Cabié [8] and Menard [9] that reported average ages of 38, 33 and 35 years respectively.

Males are more affected by this disease with a sex-ratio male to female of 1.27, which is consistent with similar studies, particularly the study of Ménard in Madagascar who reported sex-ratio of 1.3 [9].

The patients whose age is between 20 and 50 years are the most affected by ETB and the specific lethality increases proportionally with age. Several studies have reached the same conclusion stating that the age of the majority of patients is between 20 and 40 years [7], [8], [9]. The immunosuppression that precedes HIV infection or other immunosuppressive factors such as alcoholism and chronic disease, such as diabetes and kidney failure, which are, in most cases, expressed in old age, may be the main cause ETB among the elderly patients.

Moreover, the results revealed a high prevalence of pleural and ganglionar tuberculosis with 41% and 32% respectively and the peritoneal and osseous tuberculosis with 7% each, which is consistent with Malagasy three studies [9], [10], [11] and differs from the Anglo-Saxon literature that places the gonglinar and urogenital tuberculosis at the forefront followed by digestive and pleural tuberculosis which could be caused and explained by ethnic differences and also the level of endemicity of tuberculosis [9], and this could also be explained by the difficulties in practicing biopsy in some localizations especially the urogenital one [12].

Furthermore, the results show that older patients suffer preferentially from intestinal, urogenital and osseous tuberculosis. This was confirmed by the few studies that have investigated the link between age and localization of ETB, including Gassama study in Senegal [12] which showed a mean age of osseous tuberculosis coming close to 47 years. The link between age and the urogenital and intestinal localization was not clearly reported in the literature.

Regarding the distribution of patients according to the evolution, and that was in favor of cases that completed their treatments; several studies have reported a similar proportion for this category (68.6%) [10], for the lost to follow-up category (20.2%) [12] and for deaths (5%) [8], [13].

The investigation of relationship between the age and the type of evolution shows that the deaths in our sample preferentially affect older people, which could be explained by immune depression, which increases with age due to the association with chronic diseases and weakens the general health and favors the contraction of ETB [12].

CONCLUSION

In conclusion, it should be pointed out that Extrapulmonary tuberculosis in Laayoune and Tarfaya provinces remains a serious problem public health because of its incidence and mortality rates, especially among the elderly population. Despite improvements in the management of the disease by creating a new health center in Laayoune, the regional health authorities should make more effort in creating a new center in Tarfaya in order to effectively implement the national anti-TB strategy in the region and achieve better success rates.

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