Epidemiological Profile of TB in the Population of the City of Belém-Pará, Brazil: Study on the Municipal Health Unit of Fatima

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SUMMARY

Notifications of cases of tuberculosis (TB) are very important in epidemiological level, because the disease plaguing humanity comes from antiquity. TB was the leading cause of death of humans in the late 19th and early 20th century, and even today has been causing many deaths in Brazil and in the world. The research had investigative nature/regarding the quantitative endemic TB in the municipality of Bethlehem, through the analysis of statistical data from the competent bodies, as well as by means of bibliographical research. Emphasizing global data in the control of TB, explored the transmitter agent, diagnosis, treatment and cultural vision of the TB epidemic in the city. In Bethlehem, there is a high rate of TB epidemiology, verified in samples by neighborhoods and in the focus of UMS-Fatima, that due mainly to socio-cultural and economic issues in the region. This study also proposes the definition of indicators to assess and monitor TB control actions, such as determining factors for the spread of the disease, among other important scientific development.


INTRODUCTION

Health can be characterize by good physical, psychological and social functioning of the human being, according to advocates the World Health Organization (WHO)-also issues explored by the United Nations (UN) (Smith, 1994).

Addressing the issue of public health, the survey was drawn up giving relevance to the high rate of tuberculosis (TB) in the city of Belém do Pará, in the broadest sense, specifying the characteristics of the Bacillus, the contagion, the diagnosis, the treatment and the social question of the population addressed. The on-the-spot review signaled the precariousness of facts, facilitators for the epidemic in the city, where it contributes to a critical eye to improvement in the treatment and prevention of the disease.
TB is known since antiquity, where in recent years with the advancement of microscopy and the collaboration of scientists, in research of microorganisms was achieved the total morphological and physiological knowledge of the Etiologic Agent. Advance enabled the isolation of pathogen and clinical manifestations of the disease (VERONESI, 1991).

Even with the advancement of technology and science in pathological researches, TB still is causing alarming epidemic in some populations around the world. TB still requires better attention of health professionals, researchers, and public policies on prevention and treatment (VERONESI, 1991).

Another aggravating for the diagnosis of TB is the type that still confusing extrapulmonary healthcare professionals, this happens due to various forms of manifestation of the disease, which can be misdiagnosed, confused with other pathologies such as: ocular TB that affects the cornea of the individual (ORÉFICE, 2003).

The serious situation of TB in the State capital of Belem and the world is closely linked to the economic situation that has as main agent the accelerated urban growth which in turn has collaborated with the increase in poverty, poor income distribution, among others (SANTOS, 2008).

In the economic context where supported the maintenance of poverty, there is an alarming picture of acquired immunodeficiency syndrome (AIDS), this has contributed to the epidemic of TB, which affects mainly individuals who could be economically active. The increasing epidemic of human immunodeficiency virus (HIV), coupled with insufficient control of TB, directs our attention to the need for vigorous and effective measures relating to public health (FERREIRA; PORTELA; VAISHNAV, 2000).

The municipality of Bethlehem is the capital of the State of Pará, North Brazil, the country in the category of emerging country, but Stop still has the lowest human development index (HDI). Within the locational contest, it is important to match the recommendation of who that points out that diseases/contagious have significant
increase in developing countries, this framework affects the lives of people with lower socioeconomic condition (BRAZIL, 2000).

To better analyze the fragility of those infected, it was necessary to raise the following issues: what is the number of people infected by *Mycobacterium tuberculosis*, delimit a period, and, mainly, relate the main factors that contributed to the worsening epidemic of cases registered in the municipality of Bethlehem.

The research explored: the Etiologic Agent, treatment, cultural and social issue and public policies directed to the treatment and/or prevention of disease; factors that have direct or indirect connection with the epidemic, these made it possible to identify the reasons for the outbreak, between the behavior of the patient, the family and the assistance in health, guiding the TB (MEDRONHO, 2009).

The comments about the TB had the importance: collaborate with the knowledge of the notifications, trade-offs and viewing the statistics of cases of TB occurring in the population of the municipality of Bethlehem.

*The locus* was chosen by constancy in numbers of TB cases, where access to information case numbers in city level (Bethlehem) was given by the Information System of reportable diseases (SINAN), but also taking into consideration the records of the Ministry of health, Brazil level for comparative data.

The observations carried out in the Municipal Health Unit of Fatima (UMS-Fatima) were of paramount importance to the research and the information obtained allowed the bottleneck of data for statistical purposes, strengthening the search result. The epidemiological study was delimited with the interest in obtaining response to the problem concerning the TB, because there needs to be a search targeting, to achieve the objective of the final results.

**METHODOLOGY**

The research methodology is based on the general understanding about TB in the city of Bethlehem, where the data were collected from governmental and non-
governmental bibliographic references from sites on the internet, books, scientific articles and books related to the subject. Also expanded studies in analysis of cases of people affected by TB and on the observation of the work of the professionals involved in fighting the disease.

For better understanding of comparative data were used information from the Census of 2000 and 2010, identifying how the population growth in the city.

The delimitation of the research had as statistical data evaluation interval the period of time from January 2004 to December 2010. Monitoring the spot, stratified sample of the survey, were taken as requirements: interviews and observations of health professionals, interviews and follow-ups of affected by TB, the UMS-Fatima, having as base the year date of 2010.

For a greater amount of information has been used comparative data on a short caught the situation of TB in other parts of the Globe.

This work was carried out field research through a technical visit to the Central Laboratory of the State of Pará (LACEN-PA), State reference laboratory, linked to the State Secretariat of health, having as its geographical area the State of Pará in the northern region as a whole. The experience in the primary aim had LACEN knowledge of diagnosticas TB laboratory techniques.

In the Municipal Health Secretariat (SESMA), were collected statistics information system SINAN 2004 data to 2010. These were key results, knowledge of the numbers of cases, with the observation that this data is reported to the National Health Foundation (FUNASA).

For better use of the data collected in the city of Bethlehem, was used as a criterion the methodological design of the evaluation and quantitative types; Mathematics and statistical resources, i.e., the absolute data sample giving relevance to simple and stratified sampling according to mathematical rules of Giovanni (2002).
In the sample were surveyed four major neighborhoods of Bethlehem: Guamá, Yudjá, Marambaia and Quarry. These neighborhoods are considered great both the demographic point of view as in territorial extension. Specified amount of patients in these neighbourhoods, in order to have the approximate percentage of TB in the municipality.

Stratified sampling was carried out in the Municipal Health Unit of Fatima, in Bethlehem and this had the observational experience the program Directly Observed Therapy Short-Course (DOTS), the acronym DOTS originates from English, where in its translation to the Portuguese language means Treatment Directly accompanied by short-lived.

The investigation was based on the observation in General: the work of thirteen professionals involved in the treatment of patients, monitoring of 47 patients, observation of family members of these patients, the Observatory's vision a UMS program, visits of ten homes of people afflicted by the BK, the survey of the number of cases in four neighborhoods in the municipality and cultural observation.

The survey was developed in a bottleneck process in gathering data, which directed the macro to the micro (information and notices). The data collected were respectively: from government agencies globally and nationally. The loci focused, using four neighborhoods of SINAN in simple sampling notifications and notifications of the UMS – Fatima as stratified sampling. This process ensures the data reduction, improving the use of data in small loci, ensuring to evaluate the epidemiological profile of tuberculosis, terminated with the critical text of the search.

RESULTS AND DISCUSSION

In the world, a third of the population gets infected with Bacillus of Koch. In this scenario are observed annually approximately 8,900,000 new cases of tuberculosis and these are aggravating the death of 1,700,000 people per year, and pathology curable when treated properly (BRAZIL, 2006).
The Brazilian population corresponds to the results of estimation obtained by sample of 5,304,711 households and 20,274,412 of people all over the country (IBGE, 2000). The Brazil occupies the 14th place, for a total of 22 countries responsible for 80% of TB infections in the world (BRAZIL, 2006).

Due to TB have epidemiological aspect ratio, is cause for concern in scientific circles and governmental institutions related to health. In Brazil, approximately 35% of the population is afflicted with the disease annually, i.e. 50,000,000 of TB cases, and 6000 deaths are reported each year (BRAZIL, 2006).

**ADMINISTRATIVE HEALTH PROFILE IN THE MUNICIPALITY OF BETHLEHEM**

The city of Bethlehem has 29 (twenty-nine), municipal health Units, which are coordinated by the Municipal Health Secretariat of Belém do Pará, which cannot meet the entire population. The last expansion the number of municipal health Units was held in 1994 (SESMA .1994).

The problem on public health in the city of Bethlehem has been aggravating, because the population is growing and the number of health units and skilled professionals is not included in the swelling population.

Table 1: Bethlehem 2000 and 2010 Census of population (Brazilian Institute of geography and statistics)

<table>
<thead>
<tr>
<th></th>
<th>Censo 2000</th>
<th>Censo 2010</th>
<th>Crescimento Demográfico</th>
</tr>
</thead>
<tbody>
<tr>
<td>População</td>
<td>1.279.000</td>
<td>1.392.000</td>
<td>113.000</td>
</tr>
</tbody>
</table>

Crescimento demográfico em percentagem 8,12%

In table 1 were highlighted data from the 2000 and 2010 Censuses, evidencing the increase in number of inhabitants of the municipality of Bethlehem. Where the population growth is about 113,000 (113,000) people, corresponding to a percentage growth of 8.12% of the number of resident in the municipality during the period considered.

The IBGE census 2010, quantified the municipality of Bethlehem contains a number of people 654,240 male, i.e. 47% of the population and females 737,760, accounting for 53% of the total population.

CASES OF TUBERCULOSIS IN BETHLEHEM

Figure 1: epidemiological profile/total tuberculosis cases/Bethlehem from 2004 to 2009

Source: SINAN 2010

Figure 1 shows the epidemiological growth with the total cases of TB notified by SINAN in the years 2004 to 2009. It is observed that in 2004 to 2007 there was a decrease in the number of cases and the 2009 2007 there was an increase.

The decrease does not mean a good statistic, in reality this variation confirms that TB in the municipality have an epidemiological cycle that swings over the years.

It was observed that the statistical number of SINAN not TB patients accounts for repeat offenders, the epidemiological failure notification, since all cases, whether offenders or not, are recorded as new cases of the disease.
CASES OF TUBERCULOSIS BY GENDER IN THE MUNICIPALITY OF BETHLEHEM

Figure 2: graph corresponding to the years 2004-2007 TB/genre in Bethlehem.

Source: SINAN 2004 and 2007

In Figure 2, the statistical data from SINAN the years of 2004 to 2007, by gender, shows that the number of TB cases by gender in the municipality of Bethlehem does not suffer much fluctuation over the years. The numbers of cases are very close in both the male and the female gender, but it is evidenced that the male gender is the most affected by the disease.

Basic health units (UBS) have few actions aimed at men's health. The majority of health services are offered exclusively for women, children and the elderly, which contribute a larger index number of cases of infectious contagious in the masculine gender, issues also confirmed by Forbes (2005).
Table 8: tuberculosis epidemic Bethlehem 2007

<table>
<thead>
<tr>
<th></th>
<th>PULMONAR</th>
<th></th>
<th>EXTR. PULM.</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td>&lt;1</td>
<td>5</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>1-4</td>
<td>2</td>
<td>3</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>5-9</td>
<td>2</td>
<td>2</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>10-14</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>15-19</td>
<td>49</td>
<td>46</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>20-34</td>
<td>213</td>
<td>164</td>
<td>39</td>
<td>20</td>
</tr>
<tr>
<td>35-49</td>
<td>167</td>
<td>88</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>50-64</td>
<td>102</td>
<td>59</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>65-79</td>
<td>44</td>
<td>25</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>80e+</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Sub-total</td>
<td>598</td>
<td>398</td>
<td>77</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>996</td>
<td>127</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: SINAN 2007

The age range of Figure 2 is 1 to 80 years or more, where the most affected are adults, the age group in which individuals are in extreme economic activity (active living at work). It is also known that stress, poor eating habits, low income, bad housing conditions, among other aggravating, are directly linked to TB endemic confirmed by research, with equal note by Costa et al. (1998) and Gazeta et al. (2007).

This research confirms that the low level of schooling is allied to the TB epidemic. The literature review found that some American authors also confirm these observations,
as: Curry (1964) and Sbarbaro (1980) where highlighted that patients with the lowest level of education have greater adhesion to the prophylaxis of tuberculosis.

**TUBERCULOSIS EPIDEMIC IN THE NEIGHBORHOOD OF FATIMA IN BETHLEHEM**

Table 3: cases of tuberculosis in municipal health units of Fatima-2010

<table>
<thead>
<tr>
<th></th>
<th>Nº de casos</th>
<th>Percentagem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alta pela Cura</td>
<td>26</td>
<td>92,86 %</td>
</tr>
<tr>
<td>Abandono</td>
<td>02</td>
<td>7,14 %</td>
</tr>
<tr>
<td>S/ acompanhar o término</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>Transferência</td>
<td>03</td>
<td></td>
</tr>
<tr>
<td>Mudança de diagnóstico e Reação medicamentosa</td>
<td>02</td>
<td></td>
</tr>
<tr>
<td>Total dos casos com resultados</td>
<td>28</td>
<td>100 %</td>
</tr>
<tr>
<td>Total dos casos em análise</td>
<td>47</td>
<td></td>
</tr>
</tbody>
</table>

Source: SESMA 2011.

In table 3 were described patients affected by TB on the UMS-Fatima, in treatment, for the year 2010. The analysis had a total of 47 patients, where only 28 left patients, because the 19 remaining patients there was no access to the end of treatment.

Of the 19 patients describes himself as transfers, 01 03 change of diagnosis, drug reaction 01 and 14 people still did not complete the treatment, since the research ended in December 2010, while patients were still in follow-up.

Of the 28 described in recital 100% percentage, where he had the proper emphasis on research, of the cases observed, there was high for the cure of 26 people, which
corresponds to 92.86% of cases reviewed and were observed departures from 02 treatment corresponding to 7.14% of the cases.

UMS notifications-Fatima, 10 homes were visited, noting: the bad condition of hygiene, lack of sanitation, with an average of 10 people per residence were still in poor ventilation which contributes to the development of the TB epidemic and other diseases. In families observed, only one of the patients was employed at the time of the visit, residents had little schooling, elementary school complete and incomplete and low family income of minimum wage per family.

There was no notification of HIV coinfection in the cases studied. In an interview with the nurses Board of Health Research Unit, it has been reported that patients refuse to get tested for HIV and/or did not reveal the test results. The denial takes place by fear to discrimination by society and/or hospital environment. However, it is known that individual positive serum without treatment has the immune system compromised, susceptible to opportunistic infections, data also confirmed by Netto (1995) and Campos (2001).

**EXPERIENCE IN THE CENTRAL LABORATORY OF THE STATE OF PARÁ**

In the clinical examination was experienced LACEN, during a week, from six to 10 December 2010, at 7:00 hours at 9:00 in the morning. Were observed each day, two sputum exams (smear), being in total 10 spittle; in comments one material negative for BAAR, noting the high rate of TB in the State of Pará.

The growing number of cases of tuberculosis in the State is in accordance with the presented in Rio Grande do Sul, by Campos et al. (2001) demonstrated a high rate of TB in that unit of the Federation. It is also noted that growth in the State of Mato Grosso do Sul, where research was carried out by Marques et al. (2006).

Comparisons with other surveys had the intention to equate the same epidemiological profiles. It has been found in Bethlehem that the high rate of infected by TB are people
less fortunate and economically, statistics also confirmed by Costa et al. (1998), Marques et al. (2006), and also confirmed by statistical data from the Ministry of health and the World Health Organization, among other competent organs.

**FINAL CONSIDERATIONS**

The main cause for the growing increase in TB has intimate connection with the abandonment of the treatment, which ends up creating a chaotic epidemiological scenario for the municipality of Bethlehem since the abandonment makes a new treatment-resistant Bacillus often leading the individual to death.

The research revealed that the scenario of sexually transmitted diseases (STD) in the city, has been aggravating in the form of silent epidemic such as AIDS, both in the form of co-infection and the failure of notification system information of the actual number of HIV cases. The population still ignores the importance of prevention and treatment, since it is already known that the individual without treatment becomes immuno-compromised, thus facilitating the co-infection of TB and other pathogens, where this becomes vector of contamination.

The homes searched was the lack of air circulation, poor lighting, poor hygiene, poor diet, lack of employment and the low level of education; where these are direct allies to maintain TB.

The research found that the male gender is the most affected by TB, confirming the weakness in health care for the genre because historically the man be considered potentially strong physical and psychological erroneously. It was also observed the lack of assistance in public health toward the masculine gender.

Monitoring of DOTS in 2010, it was observed that on average 70% of patients lack the monitoring supervised, which ends up leaving the DOTS weakened the results expected in the aid.

The clinical and therapeutic assistance in UMS-Fatima is guided by the staff of the Health Unit, being executed by professionals ready and committed to work with the
goal of reducing the rate of withdrawal of treatment. The technical team's strategy is the frequent return for better monitoring of the clinical picture and the correct adherence to treatment. However this had a 7.14% treatment abandonment, observed in the year 2010, what proves to be a meaningful index, since each patient infected and untreated develop a resistant Bacillus a new treatment, and this becomes a potential bacilífero spreading the Bacillus to the atmosphere, infecting new individuals.

Sampling in UMS-Fatima had as main observation that the placeholder is not suitable for the realization of the DOTS since does not have adequate ventilation for the infectious. It was observed that the action ends up endangering the staff and other patients who need frequent the site for consultations in other specialties. Amid already known to science imunofragilizadas people are susceptible to Bacillus of Koch, so people looking for the UMS with immunity compromised by other diseases increase the risk of co-infection by TB.

Finalizing the observations, the main result that TB in the municipality of Bethlehem has a chaotic epidemiological scenario, with no reduction in the number of cases or the eradication of the disease, which ironically is an ancient disease and against which the scientific and/or medical means, in the present day, has extensive knowledge clinical and prophylactic. These findings only confirm the who statistics that developing countries still are being ravaged by diseases such as TB, as the disease is intimately and directly linked to questions of public policy, social and economic issues widely explored and found during the search.

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