TUBERCULOSIS, A NON-REEMERGING DISEASE IN CHIAPAS:

An analysis from the academy and social organizations

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ABSTRAC

TB represents one of the principal problems of world health. It is a reason of disease in million persons every year, and simultaneously it represents the second reason of death for an infectious disease in the whole orb, 22 countries concentrate 81 % of all the incidental cases in the world. In Mexico of a constant way about 18,000 cases of tuberculosis are brought in all his forms anually, Chiapas according to official numbers thinks inside the first ten conditions of the country that it contributes the major number of cases, nevertheless, studies realized by the academic sector and of organizations of the civil society, demonstrate in his results that the problem can be of major dimensions, since high index of cases is brought in different regions of multidrug resistance, of mortality and of low time of survival of the persons diagnosed with tuberculosis, as well as the subdiagnosis of cases, being represented as an important problem of public health in the region, with big implications of economic and social type for the affected population.

Keywords: *Chiapas, Tuberculosis, Poverty, Public health.*

Tuberculosis (TB) is an infectious-contagious disease caused by the bacterium *Mycobacterium tuberculosis (M. tuberculosis*), and can affect different parts of the human body however it is most common in its pulmonary form (TBP) which has a higher importance for public health (Quercia, 2008), and which is the main form of transmission.

The TBP is transmitted from person to person by air by people with TBP through coughing, sneezing, talking or spitting , with a million droplets expelled into the air where the tubercle bacilli may remain for hours in the environment. It is considering that three rods may be sufficient for a healthy person to become infected. An untreated person with active TB can infect between 10-15 people a year (Ticona, 2009). However, not all people infected with *M.* necessarily develop active *tuberculosis* disease, since the immune system, under normal conditions, is able to contain the infection and "encapsulate" germs, isolated by a thick waxy coat that can lie dormant for years.

The risk of disease increases as a person's immune system is weakened for different reasons. Hence TB appears much more frequently in those characterized as having precarious living and working conditions, hence it is also common among particularly vulnerable population groups such as patients with malnutrition, HIV and diabetes mellitus type II, among other diseases.

Chiapas demonstrates a great lag in the social condition and health- mainly in its indigenous communities. In this respect, there is insufficient quality and coverage of health services, as well as the presence of a highly vulnerable populations regarding health and social condition.

Thus, after doing a literature review of papers published by academics and members of social organizations done in the highlands region of Chiapas with the theme of pulmonary tuberculosis, the objective of this paper is to describe and analyze the principal results. Within these results , there is highlighted the high levels of under-diagnosis, significant levels of abandonment

of treatment and high rates of multidrug resistance and high mortality by tuberculosis (Sanchez et al, 2002; Nájera et al 2008; Reyes et al, 2008, Sanchez et al 2010; Nájera et al, 2012).

THE EPIDEMIOLOGY OF TUBERCULOSIS (TB) IN THE WORLD, MEXICO AND CHIAPAS

TB represents a major global health problem. It causes disease in millions of people each year and is also the second leading cause of death from infectious disease around the world, only after HIV-AIDS (Glaziou et al, 2011).

In 2012 it was estimated that about 8.6 million new TB cases (range, 8.3 to 9.0 million) occurred worldwide, equivalent to 122 cases per 100,000 inhabitants. The largest proportion of estimated 2011 cases were in Asia (58%) and Africa (27%), followed by the Eastern Mediterranean region (8.0%), the European Region (4.0%) and the Americas region (3%) (WHO, 2013).

In the 22 countries with high prevalence of TB[1] that have been given high priority globally since 2000 there appear around 81% of all incident cases in the world. Of the 8.7 million incident cases that occurred ,approximately 0.5 million were children and 2.9 million women (WHO, 2013).

The five countries with the highest number of incident cases in 2012 were (WHO, 2013): India (2.0-2.4 million cases), China (0.9-1.1 million), South Africa (0.4-0.6 million), Indonesia (0.4-0.5 million) and Pakistan (0.3-0.5 million). Only in India and China there were concentrated, respectively, 26% and 12% of

[1] Countries with a high level of TB in the world according to the WHO, 2011: Afghanistan, Bangladesh, Brazil, Cambodia, China, Democratic Republic of the Congo, Ethiopia, India, Indonesia, Kenia, Mozambique, Myanmar, Nigeria, Pakistan, Filipinas, Russia; South Africa, Thailand, Uganda, Tanzania, Vietnam and Zimbabwe.

global cases. Of the 8.7 million new cases in 2011, between 1.0 and 1.2 million (12-14%) were people with HIV-AIDS.

The highest proportion of TB cases co infected with HIV was in countries of Africa, a region in which 37% of TB cases were co infected with HIV, who in turn represent 75% of TB cases living with HIV worldwide (WHO, 2013).

With regard to cases of resistance to anti tuberculosis drugs (WHO, 2013), it is estimated that by 2012 worldwide there were 450 000 (range: 300 000-600 000) new cases of Multi drug resistant (MDR) TB. This total includes cases of primary and acquired MDR TB.

In the case of Mexico, according to the epidemiological history of TB, have recognized population groups that are most at risk whose characteristics have historically presented morbidity and mortality rates higher than other groups; including young adults, older than 20 years old(SSA, 2012). Other groups that have been identified as vulnerable include indigenous people, migrants, persons deprived of their liberty, people in rural areas, children under 5, among others. It has also been recognized that males are more affected than females (Arana, 2010).

According to the registry and reporting system of Epidemiological Surveillance of Tuberculosis, in 2010 there was a total of 18.848 new cases of TB reported in all forms across the country, corresponding to an incidence rate of 16.8 cases per 100 thousand inhabitants . The highest rate was in Baja California with 54.1 cases per 100,000, while the lowest (4.0 cases per 100,000 population) was recorded in Tlaxcala. In the case of Chiapas, the rate was 26.5 reported in the same denominator, being the eighth state in the country with the highest rate (SSA, 2012).

The situation of the disease in the country shows well-defined areas of concentration. Thus, the National Epidemiological Surveillance System (MOH) divides the country by groups of states in three different regions: the north, the center and the south-southeast (SSA, 2008). In the states of the north of the country

(Baja California, Sonora, Chihuahua, Coahuila, Nuevo Leon and Tamaulipas),which is considered the most developed area, there were almost 4,627 recorded cases of TBP per year (32% of the country); in fact, this is the region with the highest incidence in the country. Baja California has high morbidity and mortality, mainly due to the high presence of migratory flows, "floating" populations and laborers, large numbers of people who are illicit drug users, the presence of high incidence of HIV and diabetes mellitus, an incidence in prisons, a lack of opportunities for diagnosis and difficulties in a directly observed treatment of short course (or DOTS) (SSA, 2008).

The central region (Aguascalientes, Colima, Mexico City, Queretaro, Guanajuato, Michoacan, Tlaxcala and Mexico State) recorded almost 1,750 new cases per year (11.6% of total cases). This region is the one with the lowest incidence, but also has the highest number of people migrating to the United States, plus it has boundary with high incidence states.

In the case of South-East region (Chiapas, Guerrero, Veracruz, Oaxaca, Puebla and Tabasco) they account each year about 5,400 new cases of TBP (36% of the national total), due to the following factors : i) internal and external migration; ii) problems of access to health services, iii) low levels of development in more than 90% of the municipalities, mainly in rural areas and indigenous communities (UNDP-CDI, 2010), iv) difficulties in implementing the DOTS (heterogeneous and fragmented by the various health institutions) and presence of "silent municipalities" (municipalities where no cases have been reported, but not diagnosed, i.e. municipalities with little or no opportunity to detect and therefore diagnose cases) (b SSA, 2012).

Of the cases of TB in all its forms, recorded by the health sector in Mexico (SSA, 2012) in 2010 (18.848 cases), 81.6% (15,384 cases) corresponds to the TBP, 1.6% meningeal, 5.7% ganglionic and 11.1% for other forms of the disease. The re-emergence of TB has been associated with other diseases and / or health conditions

(comorbidities), the most common are: diabetes (21%), malnutrition (14%) and HIV / AIDS (6%). 4.9% of new cases are reported in the group of pediatric patients (<15 years).

With respect to mortality from TB for 2009 they showed 2,222 deaths in all of its forms. The mortality rate for the pulmonary form (TBP) was 1.8 per 100,000 inhabitants, representing 84% of all deaths from TB in all its forms. The states with the highest number of deaths are: Veracruz, Chiapas, Baja California, Jalisco and Nuevo Leon, who together accumulate 45% of deaths nationally (SSA b, 2012).

For the state of Chiapas, according to official figures, for 2010 an incidence rate of 26.5 cases per TBP 100,00 inhabitants (SSA, 2012) was reported. This figure indicates that Chiapas has twice the reported cases exceeding the national average (13.7 per 100,000) and ranking eighth in the states of Mexico with high prevalence of TB. Regarding mortality from TBP, it is important to note that Chiapas has occupied the top places only after Baja California (5.4 and 3.79 deaths per 100, 000, respectively).

THE SITUATION OF THE TBP IN THE HIGHLANDS OF CHIAPAS FROM A DIFFERENT PERSPECTIVE TO THE HEALTH SECTOR. ANALYSIS FROM THE ACADEMIA AND SOCIAL ORGANIZATIONS

According to official epidemiological reports, the state of Chiapas is frequently among the first eight states that have the largest number of cases of pulmonary tuberculosis (PTB) annually, just behind Baja California, Veracruz, Nayarit, Sinaloa, Sonora, Guerrero and Tamaulipas. Also in recent years, it has held second place in the number of deaths from this cause, just behind Baja California (Castellanos, 2012).

Chiapas has two regions where the TBP acquires a special significance and magnitude. One is the Soconusco region , where

there is consistently reported a higher number of cases in the state. This region is characterized by the constant flow of the cross-border migration of people from Central American countries, particularly Guatemala, and South Americans trying to reach the United States.

The increase in cases of TBP in this region has been a focus of attention by both the Mexican and Guatemalan health authorities and international organizations such as the Pan American Health Organization (PAHO) (Arana, 2010).

The highlands region normally occupies second place in the state in the number of registered cases. In this region, like what happens in the rest of the state of Chiapas, the recorded cases are generally those that are diagnosed in people who have access to health services and are detected passively. In the highlands, it might be thought that according to the conditions (poverty, marginalization, social exclusion, malnutrition and poor access to quality health care) that a better system of detection of TB cases in the region are most likely due to the prevalence of tuberculosis in this region that match or exceed that which is presented in the Soconusco (Arana, personal communication 2011).

The Program for Prevention and Control of TB in the Highlands, which is mostly inhabited by an indigenous population, presents alarming deficiencies. Consequently, the problems regarding the TBP are much greater than that which is recognized by the official sector. Thus, the problems surrounding this disease area have been an area for investigations and actions carried out by academic institutions and civil society. Several epidemiological studies have provided information on adherence to anti-tuberculosis treatment, drug resistance, mortality and survival in people affected by TBP, and the situation of TB in the rural areas of the conflict zone.

The issue of adherence to treatment in the region was addressed in a study conducted by Guillen Reyes et al (2008). This study, conducted from November 2002 to August 2003, consisted

of in-depth interviews with TB patients, family members, institutional physicians, community health coordinators, and traditional medicine practicioners. The results of this study were: i) different perceptions among patients and their families regarding health personnel; ii) communication barriers between the various actors involved in the issue of TB, either as patients, families and health workers; iii) adverse effects of the anti-tuberculosis treatment, considered as one of the main causes of treatment abandonment. The latter situation becomes relevant in the fact that the abandonment of treatment and consequently the multiple treatments turn out to be one of the main factors for the occurrence of MDR-TB , which due to lack of infrastructure to perform routine cultures in different regions of Chiapas is at an unknown magnitude.

Sanchez Perez and colleagues published a study in 2010, aimed at analyzing the proportion of MDR-TB during 2000-2002 in inhabitants of the regions of the Highlands, Selva and Northern Chiapas. Of a total of 88 cultures analyzed, 57 (64.8%) were sensitive to primary drugs, 19 (21.6%) were resistant to one drug and 12 (13.6%) were MDR-TB. Importantly, of these 88 samples that were studied, 60 belonged to residents of the highlands region of Chiapas, of which 41 (68.3%) were sensitive to anti-tuberculosis drugs , 12 (20.0%) showed resistance to one drug and 7 (11.7%) were MDR-TB. These figures become relevant and demonstrate that the situation of the MFR can be considered as a serious health problem in the highlands region of Chiapas. However, according to official figures, in the period from 2000 to 2010 there were only 13 cases of MDR-TB reported Castellanos-Joya, 2012), reflecting a discrepancy of official data and those provided by the study (Sanchez et al, 2010).

Another study, conducted during the years 2005-2006, follow-up home visits were made to 431 people during the period 1998-2002 who were diagnosed with TBP in the highlands region of Chiapas (Najera et al, 2008). In this study, 208 people were found alive, 145 were not located and 78 had died. Of the 78

deaths, 55 occurred most likely as a result of TBP or its effects. Although TBP is a preventable and curable disease, in many cases this is not fulfilled in the region, consequently resulting in mortality from TBP which has serious economic, social and family formation implications for people who suffer and even more when they die by this disease. In this regard, it is worth noting that many of the deaths by TBP are not registered as such, which results in underreporting of mortality from this cause (Najera et al, 2008).

As a consequence and in response to the results of the monitoring described above, in August 2008 civil society organizations in the region appealed to the Inter-American Human Rights System, in order to: 1. Request precautionary measures to protect the lives of those sick with drug-resistant forms of the disease (MDR-TB), for which it is requested that they administer the secondary anti-tuberculosis treatment to people; and, 2. To request information from 145 people who had not been found in the study, with the aim to locate and, where appropriate, give them the appropriate treatment.

As a result, coupled with the highlighted problems and because of the few resources the program against TB receives, as well as structural and operational failures of the program, in 2009 the Permanent Commission of Congress adopted by consensus a point of agreement to ask for an audit and a technical review of the Tuberculosis Program in Chiapas. In the same year, the Inter-American Commission on Human Rights acknowledged and approved the request for precautionary measures to protect and provide adequate medical care to the indigenous people of Chiapas who had been affected by inadequate treatment, which treatment included a second round of anti-TB treatment for those identified with MDRTB in various studies in the highlands region . Moreover, in 2010, the State Commission for Human Rights issued a recommendation to the State Health Institute of Chiapas (ISECH) that included the review of the program and increased

support for operation and training. Unfortunately it was not possible to obtain from the ISECH information that would allow the 145 people not localized in the study to be found.

As a continuation of this investigation, there was carried out an analysis of survival among patients in follow-up visits (Najera et al, 2012). The study found that among patients who died, the median survival time from date of diagnosis of TBP until his death, was 774 days (median 670, range from 0 to 3.185 days). Of all documented deaths attributable to TBP (n = 78) , 38% occurred during the first year following the date of diagnosis and 53% after two years had passed. The variables of age (45 and over) and time of taking the treatment (less than six months) were associated with decreased survival of the people by TBP (HR, 5.70 - 95% CI, 3.59-9.18).

CONCLUSIONS

According to the WHO, a reemerging disease is one that has previously existed and that presents a rapid increase in their incidence or geographical distribution (PAHO, 1995). In the case of tuberculosis, after the appearance of reliable diagnostic methods and effective therapy in the past century in many countries it was believed that the disease could be controlled and eradicated. However, increasing poverty, migration, association with HIV-AIDS, the resistance of M. tuberculosis to the usual drugs (isoniazid and rifampicin), resulted in the WHO declaring in 1993 that the disease was a "global emergency "and thus classify within reemerging diseases.

In Mexico, while if there had not been a good control of the disease one would think of it was in control and eradicated, today the problem of tuberculosis (that has always existed) has worsened mainly due to poverty, lack of access to health services and

the consequent low vaccination rates, the lack of public policies for prevention and the emergence of AIDS and most recently diabetes.

More than a re-emergence, it can be considered the resurgence of a reality already flagellant for the Mexican population, a situation that is no stranger in Chiapas- quite the contrary. As our state meets all the conditions, both those of the population as well as health services, to further the spread of the disease and have it still constitute a serious challenge in the health sector.

It is therefore necessary to reformulate concretely the public health policies employed in the management and control of the disease, both globally as part of the agenda of the 2015 Millennium Development Goals of the United Nations, and as part of Mexican and Chiapas healthcare system. In this sense, the political (and financial) will of the government of our country to prioritize the deserved control of TB is transcendental, because beyond being only a health problem, it is also a social and economic problem for individuals and families who suffer from it.

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