PREVALENCE OF PULMONARY TUBERCULOSIS AND RESPIRATORY SYMPTOMATIC SUBJECTS IN A REFERRAL PSYCHIATRIC HOSPITAL IN ALAGOAS STATE

Prevalência de tuberculose pulmonar e sintomáticos respiratórios em um hospital psiquiátrico de referência em Alagoas

Prevalencia de tuberculosis pulmonar y sintomáticos respiratorios de un hospital psiquiátrico de referencia de Alagoas

ABSTRACT

Objective: To evaluate the prevalence of bacilliferous pulmonary tuberculosis (PTB) and respiratory symptomatic (RS) subjects in a referral public psychiatric hospital in Alagoas, Brazil. Methods: Quantitative cross-sectional research conducted in the hospital wards of Portugal Ramalho Teaching Hospital by means of questionnaire forms addressing demographic, epidemiological and social data, from March to April 2013. Groups established: RS, which underwent sputum collections for bacilloscopy, and asymptomatic subjects (RA).

Results: The study included 143 participants, with 61.5% (n=88) males, 51.7% (n=74) young adults, 30.8% (n=44) illiterate and 41.3% (n=59) presenting some debilitating comorbid condition. The prevalence of bacilliferous PTB was found at 0.69% (n=1). RS represented 14.7% (n=21) of the sample and were associated with the group of patients hospitalized for over two years and without prospect of discharge (p=0.01), and to smoking (p=0.02).

Conclusion: A high prevalence of bacilliferous PTB was found in this group, compared to that found in the Brazilian population, and RS subjects were associated with longer hospitalization length and smoking.

Descriptors: Pulmonary Tuberculosis; Psychiatric Hospitals; Smoking.

RESUMO

Objetivo: Avaliar a prevalência de tuberculose pulmonar (TBP) bacilífera e sintomáticos respiratórios (SR) em um hospital psiquiátrico público de referência em Alagoas, Brasil.

Métodos: Pesquisa transversal quantitativa conduzida nas alas de internação do Hospital Escola Portugal Ramalho por meio de questionários contendo dados demográficos, epidemiológicos e sociais, de março a abril de 2013. Grupos estabelecidos: SR, submetidos às coletas para bacilloscopia, e assintomáticos (AR).

Resultados: Participaram do estudo 143 pacientes, sendo 61,5% (n=88) homens, 51,7% (n=74) adultos jovens, 30,8% (n=44) analfabetos e 41,3% (n=59) com alguma condição debilitante associada. A prevalência de TBP bacilífera encontrada foi de 0,69% (n=1). Os SR representaram 14,7% (n=21) da amostra e foram associados ao grupo de pacientes internados há mais de dois anos e sem perspectiva de alta (p=0,01), e ao hábito de fumar (p=0,02).

Conclusão: Encontrou-se nesse grupo uma alta prevalência de TBP bacilífera, se comparada à da população brasileira, sendo os SR associados ao maior tempo de internação hospitalar e ao hábito de fumar.

Descritores: Tuberculose Pulmonar; Hospital Psiquiátrico; Hábito de Fumar.
RESUMEN

Objetivo: Evaluar la prevalencia de la tuberculosis pulmonar (TBP) bacilífera y de los sintomáticos respiratorios de un hospital público psiquiátrico de referencia en Alagoas, Brasil. Métodos: Investigación transversal cuantitativa realizada en las alas de internación del Hospital Escuela Portugal Ramalho a través de cuestionarios con datos demográficos, epidemiológicos y sociales entre marzo y abril de 2013. Grupos establecidos: los Sintomáticos Respiratorios (SR), conductos a realizar la baciloscopia y los asintomáticos respiratorios (AR). Resultados: Participaron del estudio 143 pacientes, el 61,5% (n=88) hombres, el 51,7% (n=74) adultos jóvenes, el 30,8% (n=44) analfabetos y el 41,3% (n=59) con alguna debilidad asociada. La prevalencia de TBP bacilífera encontrada fue del 0,69% (n=1). Los SR representaron el 14,7% (n=21) de la muestra y estuvieron asociados al grupo de pacientes ingresados hacia más de dos años y sin perspectiva de alta hospitalaria (p=0,01) y el hábito de fumar (p=0,02).

Conclusión: En este grupo se encontró elevada prevalencia de TBP bacilífera al comparar a la población brasileña y los SR estuvieron asociados al mayor tiempo de ingreso hospitalario y al hábito de fumar.

Descriptores: Tuberculosis Pulmonar; Hospitales Psiquiátricos; Hábito de Fumar.

INTRODUCCIÓN

Tuberculosis (TB) es una enfermedad infecciosa crónica causada por Mycobacterium tuberculosis (Mt). La transmisión aerosólica es el modo predominante de dispersión, lo que representa un 80% de los pacientes que sufren de tuberculosis pulmonar (PTB), un problema de salud de gran relevancia clínica-epidemiológica (1-3). A mayor problema de salud del mundo es la tuberculosis, que es el segundo más fatal después de la malaria, con más de un millón de personas que mueren cada año. En 2012, 8.6 millones de personas enfermaron con TB, lo que representa un 16% del total mundial. En 2013, 8.7 millones de personas se beneficiaron de la terapia basada en rifampicina de primera línea. La situación es más crítica en los países en vías de desarrollo, donde la prevalencia es 5 veces más alta. A nivel global, de cada 100000 habitantes, 11.3 tienen TB, 1.6 tienen TB multirresistente y 2.7 tienen TB avanzada o inmunodeficiencia adquirida (HIV) (4-10).

Metodología: estudio transversal con enfoque cuantitativo, en el Hospital Escola Portugal Ramalho Teaching Hospital (Hospital Escola Portugal Ramalho - HEPR), en Alagoas State, a lo largo del periodo de estudio de marzo a abril de 2013. El trabajo se realizó en la Unidad de Hospitalización del Hospital Escola Portugal Ramalho - HEPR, con un total de 143 pacientes, el 61,5% (n=88) hombres, el 51,7% (n=74) adultos jóvenes, el 30,8% (n=44) analfabetos y el 41,3% (n=59) con alguna debilidad asociada. La prevalencia de TBP bacilífera encontrada fue del 0,69% (n=1). Los SR representaron el 14,7% (n=21) de la muestra y estuvieron asociados al grupo de pacientes ingresados hacia más de dos años y sin perspectiva de alta hospitalaria (p=0,01) y el hábito de fumar (p=0,02).

Conclusiones: En este grupo se encontró elevada prevalencia de TBP bacilífera al comparar a la población brasileña y los SR estuvieron asociados al mayor tiempo de ingreso hospitalario y al hábito de fumar.

Descriptores: Tuberculosis Pulmonar; Hospitales Psiquiátricos; Hábito de Fumar.
expectoration, hemoptysis and/or wheezing) – were based on the Practical Approach to Lung Health (PAL), promoted by the World Health Organization – and on the Brazilian Thoracic Association (BTA) guidelines on Tuberculosis(8,14). SR patients underwent sputum collection. Two independent specimens per patient (the second one mandatorily after fasting) were collected within a 24- to 48-hour interval, in a wide open space, and stored in portable refrigerators which kept them at +4°C until processing was performed at the Central Laboratory of Public Health of Alagoas (Laboratório Central de Saúde Pública de Alagoas - LACEN/AL). There, sputum-smear tests (bacilloscopies) searched for acid-alcohol resistant bacilli (AARB) using Ziehl-Neelsen staining(8,18). In this research, PTB cases were confirmed by two AARB-positive bacilloscopies, according to guidelines from the Pan American Health Organization (PAHO) and the BTA, which include recommendations for early detection of bacilliferous subjects(8,13).

The softwares SPSS Statistics 18 and Epi Info 3.4.2™ were used for statistical analyses. Pearson’s chi-square, Yates’s correction and Prevalence ratio (PR) tests were used for group comparison in terms of risk factors presented. A “p<0.05” value was taken as statistical level of significance.

The project complies with all the guidelines of the Declaration of Helsinki and Resolution no. 466, of 12 December 2012, of the National Health Council(19).

The study was submitted to the Local Research Ethics Committee, and approved under opinion no. 1543/12, issued in January 2013(20,21).

RESULTS

Most of the 143 participants were male (61.5%, n=88), 51.7% (n=74) of which were young adults (20-39 years old) and 79.7% (n=114), brown-skinned. The average age was 36.4 (SD= ±14.2) years.

With regard to previous housing conditions, 70.6% (n=101) of the inpatients had lived in brick houses prior to hospitalization; 12.6% (n=18) were resident patients, 9.1% (n=13) lived in precarious dwellings or did not own one (7 lived on the streets, 5 in wattle houses and 1, in a canvas hut); in 7% (n=10) of the patients records analysed, such information was not found.

As for the education level, the low level was found predominant, since 46.8% (n=67) of the assessed patients had not completed the elementary school and 30.8% (n=44) were illiterate. Only 7.7% (n=11) concluded either the whole or part of their high school education (Table 1).

With respect to debilitating conditions and comorbidities, a high number of smokers (23.8%; n=34) was identified in the sample. Also, alcoholism (20.3%; n=29), illicit drug addiction (14.7%; n=21), HIV seropositivity (0.7%; n=2) and Syphilis (0.7%; n=1) cases were reported. Yet, the simultaneous occurrence of two or three comorbidities was confirmed, respectively, in 9.8% (n=14) and 4.9% (n=7) of the participants (Table II).

Twenty-one patients (14.7%) – 9 women and 12 men – composed group SR, whose average age and length of stay were, respectively, 41.8 years and 1,456 days.

Table I - Sociodemographic profile of patients hospitalized in the Portugal Ramalho Teaching Hospital (Hospital Escola Portugal Ramalho - HEPR). Alagoas, 2013.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Total – n (%)</th>
<th>SR – n (%)</th>
<th>AR – n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>55 (38.5)</td>
<td>9 (16.4)</td>
<td>46 (83.6)</td>
</tr>
<tr>
<td>Male</td>
<td>88 (61.5)</td>
<td>12 (13.6)</td>
<td>76 (86.4)</td>
</tr>
<tr>
<td>Skin color</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>16 (11.2)</td>
<td>4 (25)</td>
<td>12 (75)</td>
</tr>
<tr>
<td>Black</td>
<td>13 (9.1)</td>
<td>2 (15.38)</td>
<td>11 (84.62)</td>
</tr>
<tr>
<td>Brown</td>
<td>114 (79.7)</td>
<td>15 (13.15)</td>
<td>99 (86.85)</td>
</tr>
<tr>
<td>Age range</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10-19 years</td>
<td>15 (10.5)</td>
<td>2 (13.33)</td>
<td>13 (86.67)</td>
</tr>
<tr>
<td>20-39 years</td>
<td>74 (51.7)</td>
<td>7 (9.46)</td>
<td>67 (90.54)</td>
</tr>
<tr>
<td>40-59 years</td>
<td>40 (28.0)</td>
<td>10 (25)</td>
<td>30 (75)</td>
</tr>
<tr>
<td>≥60 years</td>
<td>13 (9.1)</td>
<td>2 (15.38)</td>
<td>11 (84.62)</td>
</tr>
<tr>
<td>Unknown</td>
<td>1 (0.7)</td>
<td>-</td>
<td>1 (100)</td>
</tr>
</tbody>
</table>

SR=with respiratory symptoms; AR=assymptomatic.
48.5 months). Individuals from AR had been hospitalized for, on average, 357.5 days (approximately 12 months). The average hospital stay of resident patients was 4475 days (about 12 years and 3 months).

Comparison between groups SR and AR evidenced association between smoking and group SR (PR=2.91; p=0.026) (Table II). Statistically significant association was also detected between good housing condition (brick house) and AR (PR=3.719; p=0.013) (Table III). Furthermore, it was observed that residents were significantly more symptomatic than non-resident patients (PR=4.59; p=0.01) (Table IV).

The prevalence of bacilliferous PTB found in the studied group was 0.69% (n=1). The sick individual, hospitalized for the third time in the institution due to the exacerbation of his mental disorder (paranoid schizophrenia), was diagnosed by positive sputum smear obtained 53 days after the last admission. The patient was in the fourth month of treatment (maintenance phase) at the time of this study and was discharged on April 9, 2013, after improvement of psychotic symptoms and by request of his sister, what happened, however, before the end of treatment for TBP.

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**Table II - Distribution of debilitating conditions found in patients in the groups “with respiratory symptoms” (SR) and “asymptomatic” (AR), assisted in the Portugal Ramalho Teaching Hospital (Hospital Escola Portugal Ramalho - HEPR). Alagoas, 2013.**

<table>
<thead>
<tr>
<th>Conditions</th>
<th>SR Cases</th>
<th>AR Cases</th>
<th>PR</th>
<th>χ² Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholism</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2</td>
<td>27</td>
<td>0.37</td>
<td>1.76 (p=0.18)</td>
</tr>
<tr>
<td>No</td>
<td>19</td>
<td>95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking habit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9</td>
<td>25</td>
<td>2.91</td>
<td>4.945 (p=0.02)</td>
</tr>
<tr>
<td>No</td>
<td>12</td>
<td>97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of illicit drugs ilícitas</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4</td>
<td>17</td>
<td>1.62</td>
<td>0.37 (p=0.54)</td>
</tr>
<tr>
<td>No</td>
<td>17</td>
<td>105</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>1</td>
<td>6.05</td>
<td>2.02 (p=0.15)</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>121</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Syphilis**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1</td>
<td>0</td>
<td>not valid</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>122</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SR: with respiratory symptoms; AR: assymptomatic. *RP: prevalence ratio. ** Pearson’s chi-square test: 5.85 (p<0.05), but it is not valid because two cells (50%) present expected value below 5.

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**Table III - Comparative chart of living conditions prior to hospitalization of patients in the groups “with respiratory symptoms” (SR) and “asymptomatic” (AR), assisted in the Portugal Ramalho Teaching Hospital (Hospital Escola Portugal Ramalho - HEPR). Alagoas, 2013.**

<table>
<thead>
<tr>
<th>Used to live in brick house</th>
<th>AR</th>
<th>SR</th>
<th>PR</th>
<th>χ² Test (Yates)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>90</td>
<td>11</td>
<td></td>
<td>6.121 (p=0.013)</td>
</tr>
<tr>
<td>No</td>
<td>22</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total*</td>
<td>112</td>
<td>21</td>
<td></td>
<td>3.719</td>
</tr>
</tbody>
</table>


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DISCUSSION

The prevalence of bacilliferous PTB in the referral psychiatric hospital of Alagoas, is more than 12 times greater than the prevalence of TB – in all its forms – estimated in the country. This finding corroborates the results of other studies, which point out higher prevalence of the disease in scenarios of freedom deprivation compared to that in the general population\(^{(16)}\). The value found is almost 33 times higher than average incidence rates of bacilliferous PTB in Brazil (21.37/100,000) and in the Northeast (21.27/100,000), from 2009 to 2012, according to data tabulated from the Notifiable Diseases Information System (\textit{Sistema de Informação de Agravos de Notificação - SINAN}). In Alagoas, in the same period, 2,420 new cases of bacilliferous PTB were recorded – 63.2% in men, most in the age range of 20-39 years – with decreasing rates during the period (19.61; 19.52 ; 18.96; 18.83/100,000, from 2009 to 2012, respectively\(^{(13,22)}\)). The occurrence described in this paper is slightly higher (36.3 times) than the average incidence of bacilliferous PTB in Alagoas (19.23/100,000). Nevertheless, it can be overestimated as a result of possible underreporting in the state\(^{(22)}\). That is a very worrying result, especially considering that the hospital population was monitored for a short period. Attention is drawn to the epidemiological value of such high-risk environment, which can be a source of perpetuation of tuberculosis in the community\(^{(17,23)}\).

As regards the PTB case identified in the sample, this study agrees with the national trend with respect to gender and age\(^{(49)}\). On the education level, however, the patient diverged from the national profile, as he graduated from high school, whereas the great majority of these cases are either illiterate or have an incomplete primary education.

Although already in the 4\(^{th}\) month of the therapeutic scheme, the patient was still occasionally coughing. Therefore, in order to detect possible treatment failure, he was included in the SR group. Even though his sputum specimen was negative at the bacilloscopy, many risk factors, such as alcoholism, loneliness at home (lack of supervision), compromised cognition and previous reports of medication rejection, malnutrition, limitation of preventive/therapeutic measures and poor hygiene, are strongly favorable to treatment withdrawal and relapse\(^{(24,25)}\).

The lengthy deprivation of liberty taking place in the psychiatric hospital may represent higher risk of transmission, as confirmed cases may eventually suffer treatment failure, and cases may result from reactivation of a latent infection, after exposure to debilitating factors related to the environment, e.g., overcrowding, precarious hygiene conditions and unsuitable ventilation\(^{(16,18,26)}\). The association described between residents – hospitalized for 12 years and 3 months, on average – and group SR reinforces the existence of risk attributed to collective confinement environment and the fact that this is increased by long stays\(^{(16,18,26)}\).

In 2002, Brazilian researchers conducted a cross-sectional study in a psychiatric hospital of Goiás, which revealed higher rates of tuberculin skin test positivity among health professionals who worked for a longer period (30 months and 18 months, respectively, for tuberculin-positive and tuberculin-negative groups)\(^{(16)}\).

The high occurrence of debilitating conditions – smoking (23.8%), alcoholism (20.3%), illicit drug addiction (14.7%) and AIDS (1.4%) – would increase susceptibility among these subjects, which appears to be due to an immunosuppressant effect, directly caused by chronic exposure to these substances and conditions, or due to malnutrition related to an odd behavior, resulting from mental disorders or drug craving\(^{(17)}\).

Among the described conditions, this study evidenced statistically significant association only between smoking and SR. Indeed, smoking is a well-known risk factor for...
PTB, related to higher infectivity, morbidity, mortality and relapsing rates in both active and passive smokers and, therefore, it is targeted by anti-TB therapeutic strategies\(^{(8,27)}\).

This research has also shown statistically significant association between proper housing condition (brick houses) and SR. From that, one can infer that unfavorable socioeconomic backgrounds increases the risk for developing respiratory symptoms, as stated by many studies\(^{(4,5,11,27)}\). Such association suggests vulnerability to respiratory infections, including PTB.

Sputum smear test was the diagnostic choice of this work because it is non-invasive, safe, fast and inexpensive. Besides, the authors’ main objective was to identify bacilliferous patients, who account for 60-80% of PTB cases and are diagnosed by the test\(^{(27)}\). Nonbacilliferous cases represent very low risk of transmission, therefore, are unlikely to start an outbreak. Both PAHO and BTA recommend conduction of active TB case-finding studies in health services or communities of regions with high TB prevalence, thus contributing to early detection of bacilliferous cases, which diminishes community exposure time. Such strategy consists in performing sputum smear tests following the identification of symptomatic individuals\(^{(8,25,28,29)}\).

It is essential to register the limitations in the conduction of this quantitative study. The researchers have dealt with patients whose judgment capacity and cognition are frequently compromised, thus delaying some sputum collections. Furthermore, only half of PTB patients are positive at smear test and up to 30% do not even present spontaneous expectoration during the initial phase of the disease, which may have contributed to some false-negative results\(^{(17)}\).

Active search for contacts of TB patients, through PPD test, radiography and bacilloscopies, are formally recommended by the Brazilian Ministry of Health and the BTA, in order to evaluate whether or not to treat latent TB among contacts\(^{(9)}\). Such conduct was not necessary in this research, as the only identified case lived alone prior to hospital admission and was kept in isolation during the first 30 days of treatment.

CONCLUSION

The prevalence of bacilliferous PTB found in HEPR was 33 times higher than that in the Brazilian population and 12 times higher than the prevalence of all forms of TB in the country. Thus, risk environments such as the one addressed by this work are of extreme epidemiological importance and should constitute strategic targets in controlling the disease in the community. The survey also points out that the burden of TB continues to be significant in Alagoas and in the country. Additional research is needed not only to better understand the disease’s behavior in similar scenarios, but also to point solutions that support public health strategies to address this serious problem.

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CONFLICTS OF INTEREST

The authors of this study have no conflicts of interest of any kind to declare.

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