

## Nursing Care to a Patient Having Pulmonary Tuberculosis Disease and Comorbidities: Case Report

Cuidados de Enfermagem a um Paciente Portador de Tuberculose Pulmonar e Comorbidades: Relato de Caso

Cuidados de Enfermería a Paciente de la Tuberculosis Pulmonar y Comorbilidades: Presentación de um Caso

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### ABSTRACT

**Objective:** Performing a case study of a young patient having pulmonary tuberculosis disease (TB) and design a nursing care plan aiming to improve the patient life quality. **Methods:** Case study with a qualitative approach of a patient having TB, pulmonary arterial hypertension, malnutrition state and also alcoholism. The study was done at the Oswaldo Cruz University Hospital (HUOC) in Recife, Brazil, from March to June 2016. Data collection was performed through anamnesis, physical examination, medical records analysis, literary research and nursing history. **Results:** We were able to identify 13 nursing diagnoses, as follows: ineffective respiratory pattern, nutrition/fatigue, ineffective maintenance of health and home, identity/self-esteem disorders, solitude/suicide risk and spiritual distress. **Conclusion:** The nursing professionals have especial importance regarding the actions of TB control, supervising the treatment, avoiding abandonment and resistant tuberculosis, as well as, guaranteeing adherence and a successful treatment.

**Descriptors:** Nursing care, Family relationships, Pulmonary tuberculosis disease.

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## RESUMO

**Objetivo:** Realizar um estudo de caso de um jovem portador de tuberculose pulmonar (TP) e construir um plano de assistência de enfermagem, visando a melhoria da qualidade de vida do paciente. **Métodos:** Estudo de caso com abordagem qualitativa de um paciente portador de TP, hipertensão arterial pulmonar, desnutrição e alcoolismo, no Hospital Universitário Oswaldo Cruz (HUOC) em Recife-PE, no período de março a junho de 2016. A coleta de dados foi realizada mediante anamnese, exame físico, análise do prontuário, pesquisa literária e histórico de enfermagem. **Resultados:** Identificamos 13 diagnósticos de enfermagem: padrão respiratório ineficaz, nutrição/fadiga, manutenção ineficaz da saúde e do lar, distúrbios da identidade/autoestima, risco de solidão/suicídio e angústia espiritual. **Conclusão:** A enfermagem tem especial importância nas ações de controle da TP realizando a supervisão do tratamento, evitando o abandono e a tuberculose resistente, garantindo a adesão e um tratamento bem-sucedido.

**Descritores:** Cuidados de enfermagem, Relações familiares, Tuberculose pulmonar.

## RESUMEN

**Objetivo:** Realizar un estudio de caso de un paciente joven con tuberculosis pulmonar (TP) y construir un plan de atención de enfermería con el fin de mejorar la calidad de vida del paciente. **Métodos:** Un estudio de caso con enfoque cualitativo de un paciente con enfermedad de Parkinson, la hipertensión arterial pulmonar, la desnutrición y el alcoholismo, el Hospital Universitario Oswaldo Cruz (HUOC) en Recife, de marzo a junio de 2016. La recolección de datos fue realizado por la historia clínica, examen físico, análisis de la historia clínica, la investigación literaria y la historia de enfermería. **Resultados:** Se identificaron 13 diagnósticos de enfermería: Modelo ineficaz la respiración, la nutrición/fatiga, mantenimiento ineficaz de la salud y el hogar, trastornos de identidad/autoestima, la soledad de riesgo/suicidio y la angustia espiritual. **Conclusión:** La enfermería tiene especial importancia en las acciones de control TP mediante la supervisión del tratamiento, evitar el abandono y la tuberculosis resistente, asegurando la adherencia y un tratamiento exitoso.

**Descriptores:** Cuidados de enfermería, Las relaciones familiares, Tuberculose pulmonar.

## INTRODUCTION

Tuberculosis is an infectious disease caused by the *Mycobacterium tuberculosis* or the Koch's *Bacillus* organism (KB). It is one of the oldest diseases that afflicts humankind, and has becoming established as one of the main causes of morbidity-mortality in Brazil, affecting indistinctly people of various ages and social classes. It is considered a neglected disease, which affects significant population contingents, especially the underdeveloped countries, showing considerable magnitude and social transcendence.<sup>1</sup>

The disease development is related to the population living conditions, and some of the main risk factors are addressed as follows: having contact with sick people, population agglomerations, precarious socioeconomic conditions, occupational exposure, malnutrition, alcoholism or chemical dependence, diseases or conditions Immuno-

suppressing drugs (such as AIDS, diabetes, chronic renal failure, lymphomas and corticosteroids use).<sup>2</sup>

Brazil is one of the 22 countries prioritized by the World Health Organization (WHO) that concentrate 80% of the world burden of tuberculosis. In 2009, 72 thousand new cases were reported showing an incidence rate of 38/100 thousand inhabitants. From those cases, 41 thousand were bacilliferous (cases with positive sputum smear microscopy analysis), and the deaths number exceeds 4,5 thousand each year. These indicators have been placing Brazil in the 19th position in the world regarding the number of cases, where the disease reaches all age profiles with predominance of individuals considered to be economically active, between 15 and 54 years old.<sup>3</sup>

Tuberculosis is transmitted by air in almost all cases. The infection occurs from the inhalation of dry nuclei of particles containing bacilli expelled by either coughing, talking or sneezing of the patient with active respiratory (pulmonary or laryngeal) tuberculosis. Smear-positive patients are the main source of infection. However, the disease may still manifest in the bones, meninges, brain, lymph nodes, kidneys, and other sites. The exclusively extrapulmonary form does not transmit the disease.<sup>4</sup>

Pulmonary tuberculosis disease (TB) can occur in the primary, post-primary (or secondary) or miliar form. The primary form is more common in children. Usually, it comes clinically in insidious forms showing: low fever, night sweats, inappetence, and the physical examination can be inexpressive. The post-primary form is more common in the young adult, and the symptomatology includes: either dry or productive coughing (purulent or mucoid, with or without blood); late afternoon fever, no chills; night sweats; anorexia; chronic disease faces; weight loss; pulmonary auscultation with decreased vesicular murmur, amphoric or normal murmur. Chest X-ray may show single or multiple cavitations, with an average diameter of 2-5 cm. Bronchogenic dissemination may also occur, causing pneumonic consolidation indistinguishable from common bacterial pneumonia.<sup>5-6</sup>

In this scenario, the nursing role, a fundamental category for conducting public health activities in the country, is especially important in the implementation of tuberculosis control actions. The nursing professionals play a central role in ensuring the whole treatment supervision and also work towards avoiding the favoring abandonment, relapse, bankruptcy and resistant tuberculosis, certifying patients' adherence and a successful treatment.<sup>5</sup>

Considering tuberculosis as a socially relevant disease, the present study aimed to perform a case study of a patient having TB and to establish nursing diagnoses and care, offering subsidies for the elaboration of interventionist actions intending the integral care and the improvement of the patients' life quality.

## METHODS

This is a descriptive case study with a qualitative approach carried out at the Oswaldo Cruz University Hospital (HUOC) in Recife, Brazil, from March to June 2016, during practical classes of Adult Health from the 6th module of the *Faculdade de Enfermagem Nossa Senhora das Graças (FENSG-UPE)*. The subject was chosen according to criteria of interest from the clinical case discussion. Thus, a hospitalized patient with the diagnosis of TB associated with malnutrition and alcoholism was selected.

Data collection was performed through anamnesis examination, physical examination, medical records analysis and literary research on the theme. The Horta nursing history was used as the guiding instrument.<sup>7</sup> Subsequently, the patient problems were identified, and a bibliographic research was undertaken for findings correlation with the literature. During articles selection the following keywords were used: pulmonary tuberculosis and nursing care, both in the databases of indexed studies of Lilacs (Latin American and Caribbean Literature in Health Sciences) and electronic journal Scielo (Scientific Electronic Library Online), and also three documentary archives of the Health Ministry. Once the analysis and data interpretation was done, forms of the expected diagnoses, interventions, and nursing outcomes were elaborated guided by the North American Association of Nursing Diagnosis (NANDA)<sup>8</sup> and the Nursing Diagnostics book.<sup>9</sup>

The study was accomplished respecting the Resolution 466/2012 of the National Health Council of the Health Ministry, and approved by the Ethics Committee in Research HUOC, Legal opinion n° 1,790,259 under CAAE: 59293816.6.0000.5192. The interviewee was aware of the research objective, consented the study and signed the Informed Consent Term. The study presented the patient embarrassment risk and physical examination during the interview, being guaranteed its privacy. The patient identity was kept confidential, and the information anonymity was guaranteed through the researchers signature of the confidentiality term.

## RESULTS

### Case Presentation

V.M.S. a 20-year-old male, brown skin color, single, having incomplete elementary school, a native Tupanatinga citizen, Boqueirão neighborhood, countryside of the Pernambuco State (PE), Brazil. He was admitted at the Ovídio Montenegro Pavilion in the HUOC on 03/21/2016, with diagnosis of TB, pulmonary arterial hypertension (PAH), cardiomegaly, dyspnea, anorexia and significant weight loss.

He does not have information about his hereditary and family history. He reports asthma and negates surgical past. Regarding his habits, he denies smoking and using illicit drugs. He reports alcohol consumption from the age of 12 (three times a week), while working in his grandmother farm, drinking straight from the can that was shared by coworkers.

He had a hospitalization history in December 2015 at the Vital Vitalino Hospital (HVM) in Caruaru-PE, coughing with yellowish expectoration, dyspnea and weight loss (he did not know how much weight). By that time, he also presented acute febrile syndrome and complaints of arthralgia. During the investigation, a chest computed tomography scan was performed, which revealed irregular cavities in both budding tree-like bones. The Ecotransthoracic-Ecott identified increased cardiac cavity, tricuspid insufficiency, pulmonary insufficiency and major PAH. Aiming to confirm the diagnostic of TB, a bacilloscopy was performed with the positive result, and also using the GeneXpert test, showing a positive result as well, confirming rifampicin sensitivity. Hence, it allowed the treatment initialization with RIP scheme on 01/19/2016 (Coxip: 3 tablets/day). On 02/04/2016, he received hospital discharge due to clinical improvement.

On 02/09/2016, he presented worsening dyspnea and sought care in the emergency of HVM. Thus, he was readmitted and transferred to the Pernambuco Cardiological Emergency Room (PROCAPE), where he presented infection in the respiratory tract, starting with a piperacillin/tazobactam antibiotic regimen over ten days.

On 03/21/2016, V.M.S presented aggravation of his clinical condition showing tachidispnea and complementary oxygen dependency (O2). He was then transferred to the HUOC, staying at the pulmonology ward, and being under treatment with RIP scheme since 01/19/2016 without improvement. In the HUOC were performed the following examinations (Figure 1):

Reference Exams and Values	Results
HIV	Non reactive (02/25/2016)
PCR (≤6mg/L)	86.2 (02/27/2016) 23.8 (05/30/2016)
CD4: 404 - 1612 cel./ul. (33-58%)	CD4 =617 (03/30/2016)
CD8: 220 - 1129 cel./ul. (13-39%)	CD8=255 (03/30/2016)
Hemoglobin (13-16 g/dL)	9.9g/dL (03/24/2016) 11.3g/dL (05/24/2016)

Figure 1: HIV, PCR, Hemoglobin, CD4 and CD8 patient's exams under study.

Physical Exam - Date - 03/31/16: General health status compromised. Conscious. Oriented. Taquidispneic. Nose-wing beats. Symmetrical thorax with intercostal retraction and presence of snoring at the right lung apex. Using nasal catheter with 2 L/min of O2 supplementation. Pulse Oximeter, oxygen saturation (Sat O2) 96%, in air ambient Sat O2 82%. Non fever (T = 36.6 °C). Normotensive (BP = 120 x 65 mmHg). Tachycardic (p = 125 bpm and lower 2s normal capillary perfusion). BNF in 2 T S/S. Pale skin and mucous membranes. Malnourished (BMI: 15.8 kg/m<sup>2</sup>). Integral scalp, symmetrical face without lesions or blemishes. Oral cavity was showing dirty cavities and hypertrophied lingual papillae. Absence of cervical hypertrophy, axillary and inguinal ganglia. Abdomen painless to palpation, with no visceromegaly. Normal intestinal and diuretic patterns. Extremities without edema, with hypertrophy in knee joints.

In June 2016, the patient remained hospitalized in the pulmonology ward without receiving visits, showing worsening of the clinical condition, with multiple cavitations and severe pulmonary destruction, severe PAH and severe scoliosis. He received a medical opinion from orthopedics and was asked to wear a milwaukee vest. He shows worsening dyspnea, pulse oximeter (Sat O<sub>2</sub> 88-92%). Dependent on supplemental O<sub>2</sub> by a nasal catheter (3 L/min). Tachycardic (HF: 121 bpm), Normotensive (BP: 100 x 70mmHg). He has dysphagia, nausea and vomiting. He says he was fed with leftover food of the coworkers of his grandmother's farm, and that is why he repulses food. He remained in nutritional support of an industrialized formula in two schedules (600 Kcal/day and 48 g of protein) to meet nutritional needs, and showed an improvement in BMI (16.7 kg/m<sup>2</sup>). In the last weeks he has exhibited depressive tendency, no hope to live any longer, and that he will always depend on oxygen. He was found cyanotic, and with the oxygen supply system turned off. He has referred suicidal ideas. A psychologist, respiratory physiotherapist and nutritionist have accompanied him. In the figures below, are shown the medical prescription and some consented pictures of the patient (Figures 2 and 3).

1. Hypoproteic and hypercaloric diets
2. Isoniazide 75 mg + Rifampicin 150 mg - 3 tablets under fasting condition
3. Nebulization 4/4 h period - Saline solution 0.9% 3 mL + Fenoterol 6 drops + Ipratropium 20 drops
4. Spitiva<sup>®</sup> 2.5 mg - Aspirate 2 jets 1x/day
5. Foraseq<sup>®</sup> 12/400 mcg - Aspirate 1 capsule of each cartouche 12/12 h period
6. Domperidone 1 mg/mL - 10 mL VO - 30 minutes before each one of the 3 meals a day
7. Diazepam 5 mg - ½ tablet VO at 9 p.m.
8. Prednisone 20 mg - 2 tablets VO under fasting condition
9. Ferrous Sulfate - 1 tablet VO in the morning and another one in the afternoon
10. Dipirone 1 g - 1 amp + 1 amp. distilled water - EV - 6/6 h period if pain and/or fever
11. Metoclopramide - 1 amp. + 1 amp. distilled water - EV 8/8 h period if either nausea or vomiting
12. Continuous oxygen 3 L/min

Figure 2: Description of the medical prescription for the patient.

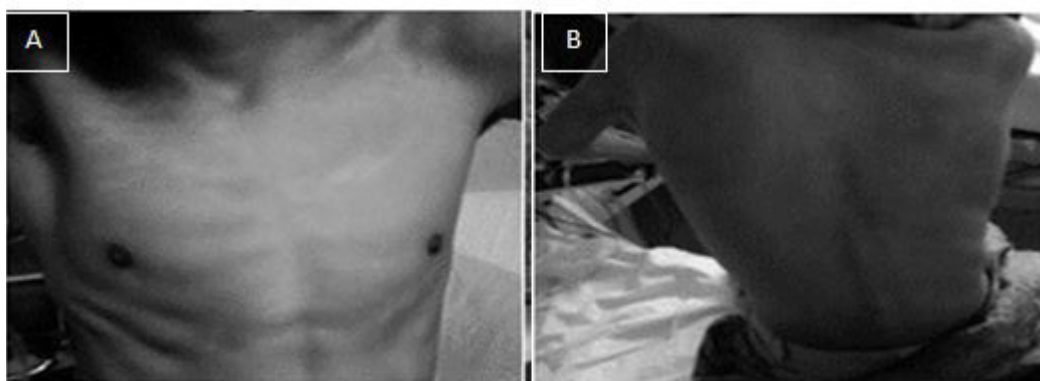


Figure 3: Patient's images. A: Intercostal drawing and malnutrition. B: Severe scoliosis

**Note:** The number of occurrences is inside the parentheses.



The nursing care plan targets to organize and systematize care in order to contribute to the identification of problems and possible interventions according to the client's reality, as well as to promote the health and well-being of them. Based on anamnesis and physical examination, it was possible to elaborate the following nursing diagnoses and their respective interventions and expected results.

#### Nursing Diagnoses:

1. Ineffective respiratory pattern related to thoracic wall deformity and disease states.
2. Impaired spontaneous ventilation related to the disease state.
3. Impaired gas exchange related to an imbalance in ventilation-perfusion ratio. Evidenced by: tachidispnea, nose-wing beats, increased heart rate and Sat O<sub>2</sub> 90%.

#### Nursing Interventions:

- Listening to respiratory sounds and detecting areas of reduction of the vesicular murmur or the presence of adventitious sounds and tremors.
- Monitoring oxygen therapy by nasal catheter 3 L/m.
- Installing pulse oximeter and monitoring/recording patient's ventilatory parameters within 6/6 h period. Reporting any changes.
- Administering prescribed bronchodilator medication each 4/4 h period.

Expected Results – The client: verbalizes understanding the factors causing dyspnea and appropriate interventions; shows improvement of the ventilation and the oxygenation; presents Sat O<sub>2</sub> results within the acceptable range; participates in the therapeutic regimen within their capabilities demonstrating appropriate coping behaviors.

#### Nursing Diagnoses:

1. Fatigue related to anemia and advanced disease. Evidenced by: skin paleness, anemia (Hb 9.9), and physical complaints of tiredness after routine activities.

#### Nursing Interventions:

2. Ensuring that the client has adequate periods of rest.
3. Monitoring sleep pattern.
4. Guiding to avoid physical exertion.
5. Administering prescribed ferrous sulfate tablets.

Expected Results – The client: refers to having more energy; participates of the desired activities according to their physical capacity; performs hygienic care without increasing dyspnea.

#### Nursing Diagnoses:

1. Unbalanced nutrition: less than physical needs related to biological, psychological and social factors. Evidenced by BMI: 15.8 kg/m<sup>2</sup> and cachexia.

#### Nursing Interventions:

- Monitoring daily intake of prescribed diet and observing dietary acceptance.
- Consulting the nutritionist and psychologist of the sector to implement an interdisciplinary therapeutic approach.
- Looking for occurrences of nausea and vomiting after feeding; medicating with prescribed antiemetic.

Expected Results – The client: demonstrates improvement of food acceptance and progressive weight gain; absence of nausea and vomiting.

#### Nursing Diagnoses:

1. Chronic pain related to compromised physical condition. Evidenced by verbal reports of pain in the lumbar spine region and presence of scoliosis.

#### Nursing Interventions:

- Determining the client's pain threshold.
- Administering analgesics according to the prescription.
- Providing milwaukee vest.

Expected Results - The client: progressively decreases the analgesics use; verbalizes and demonstrates pain relief and/or control; properly wearing the milwaukee vest.

#### Nursing Diagnoses:

1. Impaired home maintenance.
2. Ineffective health maintenance related to ineffective family coping and insufficient resources. Evidenced by: Inadequate family planning and insufficient resources. Inadequate support systems. Inability to take responsibility for meeting basic health practices.

#### Nursing Interventions:

- Identifying social and family risks that may negatively affect the health.
- Determining the level of customer dependency.
- Developing a self-care plan for the client/family.
- Stimulating socialization and personal involvement.
- Referring to the social assistance agent for guidance on available financial support options and social support systems.

Expected Results - The client: verbalizes understanding the factors that contribute to its current situation; assumes responsibility for your health needs within your capacity level; gets the appropriate and efficient use of available social support systems.

#### Nursing Diagnoses:

1. Disorders of personal identity related to low self-esteem. Evidenced by feelings of uncertainty about the future.
2. Sadness related to the experience of chronic disease. Evidenced by reporting negative feelings and oxygen dependence.
3. The risk of loneliness related to affective deprivation, social and physical isolation. Evidenced by affective

deprivation due to maternal abandonment in childhood, the death of its genitor.

4. Spiritual distress related to terminal illness, family grief/mourning, and lack of hope. Evidenced by expression of hopelessness feelings.

5. The risk of suicide related to social isolation, living alone, terminal illness, family grieving/mourning. Evidenced by expression and suicidal ideas.

Nursing Interventions:

- Listening to the client about their feelings. Stimulating verbalization of the situation.
- Talking about healthy ways to deal with stressful situations.
- Monitoring patient's attitudes; stimulating social interaction with others, such as watching television/listening to music.
- Requesting follow-up from the psychologist of the sector.
- Requesting follow-up from a religious leader, depending on the patient's religion.

Expected Results - The client: demonstrates progress in dealing with its own feelings; demonstrates reduction of negative emotions; verbalizes hope in the future; does not refer to suicidal ideas.

## DISCUSSION

Tuberculosis is a disease closely related to precarious living conditions and might be better understood in accordance to the Social Determination Theory of the Health-Disease Process. The control of its occurrence, as well as of any disease resulting from social inequalities, requires a change in the people living conditions and the organization of the services and health conditions. Therefore, it is important to know the health needs of individuals with this disease; thus, it is possible to improve the care services in order to have better quality and appropriate responses to such needs.<sup>10</sup>

It was evidenced that the results of this study were essential regarding the nursing diagnoses identified, since they facilitated the process of communicability between nursing professionals to the patient and maximized the quality of care service provided. It should be emphasized that nursing care must be used in an integral and individualized way, as it favors the reduction of the risks associated with the pathology, avoiding the interurrences that favor abandonment, relapse, resistant tuberculosis, and guaranteeing patient compliance.

V.M.S. lived alone in a hovel given by his uncle at his paternal grandmother's farm, where he worked for her and received money for his work (he did not say how much). He refers to a father who died from homicide, does not have contact with his mother, who abandoned him since he was a child while she was going to live in *São Paulo*. He has an unusual relationship with his paternal grandmother, and currently communicates with his sister only through social networks. From this information, it was understood

the hostile environment in which this individual grew up, which caused him physical, psychological and social damages. Thus, the use of Horta's theory<sup>8</sup> was justified for the scientific basis of the nursing care, since this young man's basic human needs were not met.

The patient was always alone and without family support. We here emphasize that the social assistance agent tried to get in touch with his family, and only managed to get his sister to live with him in *São Paulo* after 3 months of attempts. By that time, the pulmonologist and physiotherapist were considering how to transfer him with use of continuous supplementary O<sub>2</sub>. They considered the family presence of extreme importance, once they can share with the patient both the disease confrontation and the difficulties inherent of the drug treatment, which are paramount for a successful treatment. Even when the person with tuberculosis manifests a desire to interrupt treatment, this may not materialize because of the support of the relatives.<sup>11</sup>

Concerning the social issue, the patient feels fragile, incapable and unproductive body with a profound alteration in the self-esteem. Tuberculosis, because it is an infectious-contagious disease, causes negative changes such as detachment and personal isolation.<sup>11</sup>

The disease symptomatology such as, cough with yellowish sputum, dyspnea, and weight loss have been reported since December 2015 during hospitalization in Caruaru. The case confirmation through smear microscopy and rapid test with sensitivity to rifampicin allowed the beginning of RIP treatment in January 2016, but the patient did not present improvement.

In a study conducted in Brazil, weight loss was present in 74% of the patients having TB. Another group of authors reported that malnutrition is related to tuberculosis, both as a risk factor and as a consequence of illness. The consumptive nature of the disease is related to both anorexia and inflammatory cytokines release, which generate a catabolic state.<sup>12</sup>

We believe that V.M.S. already presented a malnutrition condition by the described life conditions, which suggests that it was a risk factor for the worsening of its current situation. The slight increase in BMI (15.82 to 16.71 kg/m<sup>2</sup>) was due to the use of nutritional supplementation, since he was tough to feed properly due to nausea and vomiting, which could also be side effects of tuberculosis treatment.<sup>13</sup>

During the case investigation, thorax-computed tomography was performed evidencing irregular cavitations in both lungs and appearance of budding trees. In studies<sup>12</sup> that analyzed the immunosuppression degree, cavitation was more frequent in those with CD<sup>4</sup> cells higher than 200 cells/mm<sup>3</sup>, which is similar to our result in this study (CD<sup>4</sup> = 617 cells/mm<sup>3</sup>).

The Ecotranstoracic-Ecott examination revealed that the patient presented increased cardiac cavity, tricuspid insufficiency, and major PAH, besides pulmonary insufficiency. It was understood that the aforementioned alterations were due to the TB, since it caused severe pulmonary destruc-

tion, identified in the thorax-computed tomography, which triggered the appearance of other comorbidities.

The HIV infection is one of the biggest risk factors for tuberculosis. In immunocompetent patients, the chance of a tuberculosis infection progressing to the illness condition is 10% throughout life; in HIV-infected individuals, this chance is 8-10% each year.<sup>12</sup> Due to the clinical condition severity presented, the suspicion of HIV infection was raised, but when the serology was performed the result was negative. After a while, the test was repeated and once again the negative result was obtained, then abandoning this infection possibility. Accordingly, the TB was considered as the underlying pathology and not a coinfection, which the main risk factors were poor living conditions, malnutrition, and alcoholism as described in the literature.<sup>2-6</sup>

## CONCLUSIONS

Regarding the nursing care provided to the studied patient, it was observed the importance of maintaining a good relationship with the nursing team. It was also found that trust is a fundamental factor to maintain the bond and achieve patient confidence, especially in the case of V.M.S., who was abandoned by his relatives and lost his genitor in a tragic way.

Therefore, we conclude that the care process is indeed very important for patients having tuberculosis, especially when it comes to be a nurse private action concerning the individual and collective health care, aiming to enable treatment success, prevent relapse and stabilize life for health maintenance.

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