



## Mental disorders in leprosy: An underdiagnosed and untreated population



Clarissa Iris Rocha-Leite <sup>a</sup>, Roberta Borges-Oliveira <sup>a</sup>, Lucas Araújo-de-Freitas <sup>b</sup>,  
Paulo Roberto Lima Machado <sup>c</sup>, Lucas C. Quarantini <sup>a,b,\*</sup>

<sup>a</sup> Postgraduate Medicine and Health (PPgMS), Universidade Federal da Bahia, Salvador, Bahia, Brazil

<sup>b</sup> Psychiatry Service, University Hospital and Department of Neurosciences and Mental Health, Federal University of Bahia, Salvador, Bahia, Brazil

<sup>c</sup> Leprosy Clinic, University Hospital Complex Prof. Edgard Santos (Com-HUPES), Postgraduate Medicine and Health (PPgMS), Federal University of Bahia, Salvador, Bahia, Brazil

### ARTICLE INFO

#### Article history:

Received 15 October 2013

Received in revised form 14 February 2014

Accepted 15 February 2014

#### Keywords:

Mental disorders

Leprosy

Comorbidity

Hansen's disease

### ABSTRACT

**Objective:** To describe the frequency of psychiatric comorbidities in leprosy patients and check if they had been previously diagnosed and were in psychiatric care.

**Method:** The study was conducted with a sample of 120 leprosy patients being treated at two reference hospitals for leprosy in Salvador, Bahia, Brazil. Survey participants were more than 18 years of age, had a confirmed diagnosis of leprosy and was undergoing antimicrobial treatment. Patients were evaluated face-to-face with a socio-demographic questionnaire and the Mini-International Neuropsychiatric Interview (MINI-Plus) in Portuguese. The period of data collection was between October 2009 and June 2012.

**Results:** The assessment using the MINI-Plus showed that 34 (28.3%) patients did not receive any psychiatric diagnosis and 86 (71.7%) met the criteria for at least one. Of these 86 patients, 25 (20.8%) had one diagnosis, 26 (21.7%) had two diagnoses and the rest, 35 (29.2%), had three or more psychiatric diagnoses. All patients with a moderate or high risk of suicide had one or more psychiatric comorbidities.

**Conclusion:** Leprosy patients have a high prevalence of psychiatric comorbidities. Furthermore, most of them had no previous psychiatric diagnosis and the majority was not undergoing treatment.

© 2014 Elsevier Inc. All rights reserved.

### Introduction

Leprosy is an infectious disease which is highly associated with physical disability [1] and the appearance of symptoms depends on individual immune response [2]. Among the main limitations imposed by the disease are peripheral neuropathy, especially neural thickening, and muscular dystrophies [3]. Consequently, leprosy is strongly associated with chronic neuropathic pain and this may occur before, during or even after the disease is cured [4]. The global leprosy situation and the number of new cases detected globally each year have been declining steadily [5]. The number of new cases of leprosy detected worldwide and the prevalence during 2012 were reported by 105 countries. The countries most affected by leprosy are India, Brazil and Indonesia [6]. In addition, there continues to be a stigma attached to leprosy [7–9].

Both developed and developing countries exhibit social stigma toward patients with leprosy in several important life contexts [10]. The stigma attached to leprosy occurs not only because of skin lesions, but also from the involvement of peripheral nerves causing deformities and possibly multiple complications. This problem is not limited to the dermatological aspect, but also a history of segregation, which is socially rooted in our social imagination, and strongly associated with the portrayal of leprosy in the Bible. Historically, being affected by leprosy meant experiencing social exclusion, isolation and discriminatory practices. Up to the present day, stigma leads to the socio-economic effects of leprosy through discriminatory behavior and unemployment [8]. People affected by leprosy experience major problems as regards participation restrictions, perceived stigma, feelings of shame, problems related to marriage and difficulties in employment [11]. Furthermore the stigma of leprosy leads to the process of social estrangement and progressive loosening of social bonds between an individual and their family and society [10]. Subduing the leprosy stigma requires a variety of strenuous efforts [10,12]. The overall strategy 2011–2012 [11] emphasizes the need to promote lessening the stigma and discrimination against persons affected by leprosy and their families.

\* Corresponding author at: Serviço de Psiquiatria, Hospital Universitário Prof. Edgard Santos, 3° Andar, Rua Augusto Viana, S/N Canela 40.110-060, Salvador, Bahia, Brazil. Tel.: +55 71 92767743.

E-mail address: lcq@ufba.br (L.C. Quarantini).

The World Health Organization (WHO) aims to reduce and control the disease in the world [13] and believes that leprosy is a disease that causes, around the world, annually, around 12,000–14,000 new cases of grade-2 disability [6]. Such loss of bodily function is certainly highly relevant to and contributes toward the psychological impact.

Psychological factors may be compounded upon the dermatological conditions of leprosy. Common psychiatric symptoms such as anxiety and depression can modulate the tactile perception of the patient [14], affecting the prognosis and adherence to treatment. On the other hand, comorbid psychiatric disorders may arise secondary to dermatological lesions due to the visibility and social value given to the skin and also in response to stress, social isolation and stigmatization [15].

In this present study we aim to investigate the frequency of mental disorders in leprosy patients from two reference centers in a metropolitan area in Northeastern Brazil.

## Methods

### Study design

The original study was of a descriptive, census and observational nature.

### Participants

A sample of 120 consecutive leprosy outpatients seeking treatment in two reference centers for leprosy, Hospital Dom Rodrigo de Menezes and University Hospital-Com-HUPES, Salvador, Northeast, Brazil, were invited to participate. Eligible patients were more than 18 years of age and had a confirmed leprosy diagnosis, and were undergoing antimicrobial treatment. The local Institutional Review Board approved the study protocol (062.2010 Protocol on August 5, 2010–0042.0.442.000-10 CAAE).

### Procedure

After providing written consent, patients were evaluated in person with a research team member who administered a socio-demographic questionnaire and the Mini-International Neuropsychiatric Interview (MINI-Plus) – a short, structured diagnostic psychiatric interview for Diagnostic and Statistical Manual of Mental Disorders, fourth Edition (DSM-IV) disorders, validated to Portuguese. The interview was conducted by three research psychologists trained on these scales, under the supervision of a psychiatrist regarding the clinical history and mental status exam. MINI-Plus was also used to assess the risk of suicide. All subjects detected with mental disorders were referred for specialized psychiatric or psychological clinical assistance. The period of data collection was from October, 2009 to June, 2010 in Hospital Dom Rodrigo de Menezes and September, 2010 to January, 2012 in Com-HUPES.

Data was registered and analyzed using the Statistical Package for Social Sciences (SPSS for Windows, version 15.0; SPSS, Chicago, IL, USA). Due to the explorative character of the study, sample size was not calculated beforehand. Data describing quantitative measures are expressed as median or mean  $\pm$  SD unless indicated otherwise. Qualitative variables are presented as counts and percentages.

## Results

The study included 120 patients undergoing antimicrobial treatment for leprosy. Those interviewed were mostly male (52.5%), with an average age of 42.6 years (SD 15.8 years) (ranging from 18 to 79). Regarding marital status, 49% were married, 43% were single, 6% widowers and 2% divorced. Concerning religion, 24% didn't belong to any; most participants said they were Catholic (47%), followed by Protestant (26%), Spiritualist (2%) and other religions (2%). [Table 1].

The assessment using the MINI-Plus showed that 34 (28.3%) patients did not have any psychiatric diagnosis and 86 (71.7%) had at least one. Of these 86 patients, 25 (20.8%) met the criteria for one diagnosis, 26 (21.7%) had two diagnoses and the rest, 35 (29.2%), had three or more psychiatric diagnoses. Of the total samples, 73 (60.83%) had multibacillary

**Table 1**

Socio-demographic data for leprosy patients being treated at two hospitals for leprosy in Salvador, Bahia, 2009–2012

Variable	Total (n)	Total (%)
Gender		
Male	63	52.5
Female	57	47.5
Marital status		
Single	52	43.3
Married	52	43.3
Remarried	7	5.8
Divorced	2	1.7
Widowed	7	5.8
Religion		
No religious affiliation	29	24.2
Catholic	56	46.7
Protestant/evangelical	31	25.8
Spiritist	2	1.7
Other religion	2	1.7
Age		
Age < 40	60	50
Age $\geq$ 40	60	50
Schooling		
People who had no schooling	19	15.8

clinical classification compared with 47 (39.17%) who had the paucibacillary type of the disease.

The diagnosis of major depressive disorder was the most common. Of all patients, 37 (30.8%) were diagnosed with current depression and 39 (32.5%) had depression in the past.

From the entire sample of 120, 19 (15.8%) met the diagnostic criteria for panic disorder, 14 (11.7%) for agoraphobia and 18 (15%) for obsessive-compulsive disorder. In addition, 14 (11.7%) had body dysmorphic disorder (BDD), 11 (9.2%) generalized anxiety disorder, 11 (9.2%) social phobia and 7 (5.8%) somatoform pain disorder. Regarding the risk of suicide, it was absent in 99 subjects (71.3%), low in 20 (16.7%), moderate in 5 (4.2%) and high in 9 (7.5%) [Table 2].

All patients with moderate or high risk for suicide had one or more psychiatric comorbidities. Among the patients with moderate risk for suicide the following disorders were present: current depressive disorder (20%), depressive disorder in the past (80%), current hypomanic disorder (20%), manic in the past (20%), agoraphobia (40%), obsessive compulsive disorder (20%) and generalized anxiety disorder (20%). Among the patients with high suicide risk the following disorders were present: current depressive disorder (67%), depressive disorder in the past (44%), panic disorder (56%), current hypomanic disorder (11%), past hypomanic disorder (11%), current manic (11%), manic in the past (11%), agoraphobia (33%), social phobia (33%), obsessive compulsive disorder (22%), abuse and alcohol dependence (11%), generalized anxiety disorder (11%), BDD (44%), somatoform pain disorder (33%), and premenstrual dysphoric disorder (22%).

Among the entire sample, only four patients (3.3%) had been previously accurately diagnosed and only one was currently receiving psychiatric/psychological treatment (0.8%) [Table 3].

## Discussion

Patients with leprosy had a high prevalence (11.7%) of BDD, compared with the general population, which is 7% [16]. In the general population, individuals with BDD reported higher rates of suicidal ideation (19% v. 3%) and suicide attempts due to concerns about appearance (7% v. 1%) than individuals who did not meet the criteria for BDD [16].

Moreover, the prevalence of leprosy patients with pain disorder (5.8%) was lower in comparison to the general population without leprosy (30.3%  $\pm$  11.7%) [17] as well as the population with chronic non-malignant pain (16–18%) [18].

The most frequent diagnosis was of major depressive disorder (37, 30.8%). Similarly, in other studies, depressive illness was diagnosed with prevalence of 8% [19], 12% [20–22], 20% [23], 25% [24], 35% [25], 46% [26], 49% [27], 55% [28].

The results show that leprosy patients have a high prevalence of psychiatric comorbidities. Beyond that, most of them had no previous psychiatric diagnosis and the majority were not undergoing psychological treatment. These findings are in accordance with previous studies of other clinical populations such as HCV-infected patients [17]. In the present study, 71.6% of patients screened positive for psychiatric diseases. Similar morbidity rates were found in a study conducted in

**Table 2**

Psychiatric comorbidities in leprosy patients being treated at two hospitals for leprosy in Salvador, Bahia, 2009–2012

Comorbidities	n	%
Mood disorders		
Depressive disorder		
Current	37	30.8
Past	39	32.5
Dysthymic disorder		
Current	4	3.3
Past	7	5.8
Hypomanic episode		
Current	3	2.5
Past	0	0
Manic episode		
Current	4	3.3
Past	2	1.7
Suicide risk		
Low	20	16.7
Moderate	5	4.2
High	9	7.5
Anxiety disorders		
Panic disorder	19	15.8
Agoraphobia	14	11.7
Social phobia	11	9.2
Obsessive–compulsive disorder	18	15
Generalized anxiety disorder	11	9.2
Substance-related disorders		
Current dependence or abuse of alcohol	4	3.3
Abuse and alcohol addiction over lifetime	1	0.8
Abuse or dependence on psychoactive substances	4	3.3
Psychotic disorder		
Current psychotic disorder	3	2.5
Psychotic disorder over lifetime	2	1.7
Somatic symptom disorder		
Body dysmorphic disorder	14	11.7
Somatoform pain disorder	7	5.8
Other mental disorders		
Current anorexia nervosa	0	0
Hyperactivity disorder	5	4.2
Adjustment disorder	0	0
Premenstrual dysphoric disorder	5	4.2
Mixed disorder of anxiety and depression	1	0.8

India [28] with 76% psychiatric morbidity. The prevalence of psychiatric comorbidity in leprosy patients differs widely across the range of existing studies; individual studies conducted in India [29] found 53.8%, Kenya [27] found 53.3%, India found 44.4% [30], and a lower rate was observed in Ethiopia with 34.6% [31] of psychiatric comorbidity with leprosy.

A high frequency of BDD was also evident in this study. In such cases, subjects demonstrated an exaggerated concern with appearance and focused on fear of physical changes caused by leprosy. Moreover, they carried a self-image of imagined or exaggerated deformity, due to the popular image of people with leprosy, as well as fear of consequences from the drug (clofazimine) that may darken or redden the skin [32].

Some possible explanations for the fact that almost all patients with current or previous mental disorders were not detected include: 1. The difficulty of accessing public mental healthcare in Brazil [33]; 2. Patients suffering from leprosy can be prone to minimizing psychiatric complaints due to the fear of being discriminated against for having mental illness, since stigmas and stereotypes still exist in the network of mental healthcare [34]; 3. Somatic complaints may distract attention from underlying psychiatric symptoms [35] since clinicians in the Brazilian

**Table 3**

Psychiatric intervention in leprosy patients being treated in Salvador, Bahia, 2009–2012

Variable	n	%
Patients who did not have any psychiatric diagnosis	34	28.3
One psychiatric diagnosis	86	71.7
Psychiatric diagnosis prior to leprosy	4	3.3
Currently under psychiatric care	1	0.8

healthcare system are under pressure to see as many patients as possible in a limited time. Consequently, focus is usually restricted to physical symptoms to the detriment of psychological issues.

In the present study, 1.6% of patients screened positive for a psychotic disorder during their lifetime. The literature [35] also reported that the incidence of psychosis among these patients was small and manifested in the particular form of psychosis directly associated with Hansen's disease.

Failure to identify mental disorders can cause human, social and economic damage [36]. It is important to note that non-recognition of psychiatric comorbidity may compromise adherence to treatment, increase functional impairment and worsen the prognosis of a patient with a chronic illness [37]. In addition, the present study shows that more than 10% of leprosy patients scored moderate or high for suicide risk. Other studies also demonstrate similar results when presents relevant rates of suicide ideation (50.3%) [40], suicide attempt (8.3%) [38] or death by suicide (16%) [39] in leprosy patients, what evidences how essential is to invest in mental health care to these patients.

This study has inherent limitations as a descriptive study in two tertiary centers specifically for Hansen's disease, in addition to not having a control group. Regardless of these limitations, this work reveals the value of thoroughly investigating comorbid mental disorders in patients with Hansen's disease, considering the high prevalence of psychiatric conditions in this population. We have not evaluated marriage as a protective factor for the development of mental disorders. Since this was not a prospective study, the duration of leprosy and psychiatric illness was not evaluated. The study did not include a control group for socio-economic status. Finally, this study has implications for the urgent need of improvement of mental assistance for leprosy patients. Future studies with a higher sample size and using psychological treatments, which focus on stress reduction as a means of improving management of leprosy, are required.

### Conflict of interest

The authors do not have any actual or potential conflict of interest, including any financial, personal, or other relationship with other people or organizations, within three years of beginning the work submitted, that could inappropriately influence, or be perceived to influence, their work.

### Acknowledgments

This project was supported by the National Council of Technological and Scientific Development (CNPq): (474869/2010-5) – Edital Universal MCT/CNPq 14/2010. Thanks to the English language reviewer, Graham Hearn.

### References

- [1] Slim FJ, Keukenkamp R, van Schie CH, Faber WR, Nolle F. Foot impairments and limitations in walking activities in people affected by leprosy. *J Rehabil Med* 2011;43:32–8.
- [2] Goulart IM, Penna GO, Cunha G. Immunopathology of leprosy: the complexity of the mechanisms of host immune response to *Mycobacterium leprae*. *Rev Soc Bras Med Trop* 2002;35:365–75.
- [3] Chacha JJ, Sotto MN, Peters L, Lourenço S, Rivitti EA, Melnikov P. Peripheral nervous system and grounds for the neural insult in leprosy. *An Bras Dermatol* 2009;84:495–500.
- [4] Reis FJ, Saadi LM, Gomes MK, Gosling AP, Cunha AJ. Pain in leprosy patients: shall we always consider as a neural damage? *Lepr Rev* 2011;82:319–21.
- [5] WHO, World Health Organization. Leprosy (Hansen disease) report by the secretariat. EXECUTIVE BOARD 128th Session, EB128/16, Geneva; December 2010.
- [6] WHO, World Health Organization. Weekly epidemiological record. Global leprosy situation 2012. 87 2012;34:317–28 [<http://www.who.int/wer/2012/wer8734.pdf>].
- [7] Staples J. Interrogating leprosy 'stigma': why qualitative insights are vital. *Lepr Rev* 2011;82:91–7.
- [8] Bonney JJ. Responding to the socio-economic implications of leprosy. *Lepr Rev* 2011;82:98–102.
- [9] Chaturvedi SK, Singh G, Gupta N. Stigma experience in skin disorders: an Indian perspective. *Dermatol Clin* 2005;23:635–42.

- [10] Roosta N, Black DS, Rea TH. A comparison of stigma among patients with leprosy in rural Tanzania and urban United States: a role for public health in dermatology. *Int J Dermatol* 2013;52:432–40.
- [11] Van Brakel WH, Sihombing B, Djarir H, Beise K, Kusumawardhani L, Yulihane R, et al. Disability in people affected by leprosy: the role of impairment, activity, social participation, stigma and discrimination. *Glob Health Action* 2012;5:183–94.
- [12] Omobolanle K, Temitayo A. Leprosy stigma: ironing out the creases. *Lepr Rev* 2011;82:103–8.
- [13] Enhanced global strategy for further reducing the disease burden due to leprosy (plan period: 2011–2015). New Delhi: World Health Organization, Regional Office for South-East Asia, 2009 (SEA-GLP-2009.3); 2009 [Available from [http://www.searo.who.int/LinkFiles/GLP\\_SEA-GLP-2009\\_3.pdf](http://www.searo.who.int/LinkFiles/GLP_SEA-GLP-2009_3.pdf), accessed October 2012].
- [14] Mohammad J. Psychodermatology: a guide to understanding common psychocutaneous disorders. *J Clin Psychiatr* 2007;9:203–13.
- [15] Mercan S, Ilknur AK. Psychodermatology: a collaboration between psychiatry and dermatology. *Turk Psikiyatri Derg* 2006;17:305–13.
- [16] Rief W, Buhlmann U, Wilhelm S, Borkenhagen A, Brähler E. The prevalence of body dysmorphic disorder: a population-based survey. *Psychol Med* 2006;36:877–85.
- [17] Batista-Neves S, Quarantini LC, Galvão-de Almeida A, Cardeal M, Lacerda Acioly L, Paraná R et al. Impact of psychiatric disorders on the quality of life of Brazilian HCV-infected patients. *Braz J Infect Dis*; 13(1): 40–43. Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S141](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S141)
- [18] Harker J, Reid KJ, Bekkering GE, Kellen E, Bala MM, Riemsma R, et al. Epidemiology of chronic pain in Denmark and Sweden. *Pain Res Treat* 2012;37:12–48, <http://dx.doi.org/10.1590/S1413-86702009000100009> [86702009000100009&lng = en].
- [19] Kumar JH, Verghese A. Psychiatric disturbances among leprosy patients. An epidemiological study. *Int J Lepr Other Mycobact Dis* 1980;48:431–4.
- [20] Bharath S, Shamasundar C, Raghuram R, Subbakrishna DK. Psychiatric morbidity in leprosy and psoriasis—a comparative study. *Indian J Lepr* 1997;69:341–6.
- [21] Nishida M, Nakamura Y, Aosaki N. Prevalence and characteristics of depression in a Japanese leprosanium from the view points of social stigmas and ageing. A preliminary report. *Lepr Rev* 2006;77:203–9.
- [22] Senturk V, Stewart R, Sagduyu A. Screening for mental disorders in leprosy patients: comparing the internal consistency and screening properties of HADS and GHQ-12. *Lepr Rev* 2007;78:231–42.
- [23] Tsutsumi A, Izutsu T, Akramul Islam MD, Amed JU, Nakahara S, Takagi F, et al. Depressive status of leprosy patients in Bangladesh: association with self-perception of stigma. *Lepr Rev* 2004;75:57–66.
- [24] Su TW, Wu LL, Lin CP. The prevalence of dementia and depression in Taiwanese institutionalized leprosy patients, and the effectiveness evaluation of reminiscence therapy—a longitudinal, single-blind, randomized control study. *Int J Geriatr Psychiatry* 2012;27:187–96.
- [25] Erinfolami AR, Adeyemi JD. A case control study of psychiatric morbidities among subjects with leprosy in Lagos, Nigeria. *Int J Psychiatry Med* 2009;39:89–99.
- [26] Olivier HR. Psychiatric aspects of Hansen's disease (leprosy). *J Clin Psychiatry* 1987;48:477–9.
- [27] Kisivuli AJ, Othieno CJ, Mburu JM, Kathuku DM, Obondo A, Nasokho PW. Psychiatric morbidity among leprosy patients in Teso and Busia districts of Western Kenya. *East Afr Med J* 2005;82:452–6.
- [28] Verma KK, Gautam S. Psychiatric morbidity in displaced leprosy patients. *Indian J Lepr* 1994;66:339–43.
- [29] Sanyal D, Das Gupta D, Mahapatra N, Samanta SK. A process report on physical and psychological determiners of social functioning in leprosy patients. *Indian J Lepr* 2011;83:225–9.
- [30] Bhatia MS, Chandra R, Bhattacharya SN, Mohammed I. Psychiatric morbidity and pattern of dysfunctions in patients with leprosy. *Indian J Dermatol* 2006;51:23–5.
- [31] Leekassa R, Bizuneh E, Alem A. Prevalence of mental distress in the outpatient clinic of a specialized leprosy hospital. Addis Ababa, Ethiopia, 2002. *Lepr Rev* 2004;75:367–75.
- [32] Job CK, Yoder L, Jacobson RR, Hastings RC. Skin pigmentation from clofazimine therapy in leprosy patients: a reappraisal Source Pathology Research Department, Gillis W. Long Hansen's Disease Center, Carville, LA 70721. *J Am Acad Dermatol* Aug. 1990;23:236–41.
- [33] Brasil, Ministério da Saúde. Saúde Mental no SUS: as novas fronteiras da Reforma Psiquiátrica. Secretaria de Atenção à Saúde, DAPES, Coordenação Geral de Saúde, Relatório de Gestão 2007/2010, 106; 2011. p. 3.
- [34] Batista-Neves SC, Quarantini LC, de Almeida AG, Bressan RA, Lacerda AL, de-Oliveira IR, Paraná R, Miranda-Scippa A. High frequency of unrecognized mental disorders in HCV-infected patients. *Gen Hosp Psychiatry* 2008;30:80–2.
- [35] Monrad-Krohn GH. Incidence of psychosis among leprosy patients. The neurological aspect of leprosy, Christiania 1923;70:11–2.
- [36] WHO, World Health Organization. World health report 2001: mental health: new understanding, new hope. World Health Organization; 2001.
- [37] Katon W. The impact of major depression on chronic medical illness. *J Psychosom Res* 2002;53:859–63.
- [38] Behere PB. Psychological reactions to leprosy. *Lepr India* 1981;53:266–72.
- [39] Shen J, Liu M, Zhou M, Li W. Causes of death among active leprosy patients in China. *Int J Dermatol* 2011;50:57–60.