Prevalence of restless legs syndrome among leprosy patients: a hospital based study

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Summary
Introduction and Objectives: Restless legs syndrome (RLS) is a type of neurological disorder which presents with an uncontrollable urge to move legs and arms. It commonly affects legs more than arms. Data regarding prevalence of restless legs syndrome in leprosy are sparse. The aims and objectives of the study were to find out the prevalence of RLS in people affected by leprosy and to determine the presence and magnitude of sleep disruption in leprosy patients with RLS.

Materials and Methods: Total 143 patients diagnosed with leprosy were enrolled in the study. A diagnosis of RLS and a severity assessment were made using the criteria described by International Restless Legs Syndrome Study Group. The Pittsburgh Sleep Quality Index (PSQI) was evaluated in all those who were diagnosed with RLS.

Results: Out of 143 patients recruited in the study, 56 (39.16%) patients were found to be suffering from RLS. Mean Pittsburgh Sleep Quality Index global score was higher (16.55), and the value was specifically higher among patients presenting with Type-2 lepra reaction (17.8) and pure neuritic leprosy (15.93).

Conclusions: The frequency of RLS among leprosy patients is significantly higher. They suffer from bad sleep quality at night which significantly affects their quality of life. So all patients affected with leprosy should be evaluated for RLS and early treatment should be started to improve their sleep.

Introduction

Restless legs syndrome (RLS) is a neurological sensory motor disease characterized by an urge to move the legs with or without an uncomfortable and unpleasant sensation. The urge to move the legs and accompanying unpleasant sensation begin or worsen during periods of rest or inactivity more so in the evening or night and are typically relieved by movement. The symptoms include paresthesias or dysesthesias, and are often described by the patient as uncomfortable, irritating or painful.

Most people with RLS face difficulty falling asleep and staying asleep leading to exhaustion and daytime fatigue. Sleep deprivation strongly affects personal relations, and
routine activities and the professional life of people suffering from restless legs syndrome. They often face difficulty with concentration, have impaired memory and these difficulties cumulatively become a cause of depression.

RLS affects both the sexes though women are twice as likely to suffer then men. All age groups are affected, but the symptoms are more frequent, more severe and tend to last for a longer period of time in middle-aged or older people. The prevalence of RLS in the general population has been reported as varying between 1.9% and 15%.4 Various underlying diseases known to cause RLS include iron deficiency anemia,5 megaloblastic anemia (vit B12 deficiency), kidney failure,7–9 diabetes,10,11 rheumatoid arthritis12 and parkinsons disease,13 multiple sclerosis14 and venous insufficiency.15 Treating the underlying condition often provides relief from RLS symptoms. Medications like antinausea drugs (prochlorperazine or metoclopramide,16 antipsychotic drugs (haloperidol or phenothiazine derivatives), antidepressants that increase serotonin17 and some cold and allergy medications that contain sedating antihistamines can also contribute to RLS. Pregnancy, especially in the last trimester is a known factor for RLS. In most cases, symptoms usually disappear within 4 weeks after delivery.18–21

Leprona is a chronic granulomatous disease caused by *Mycobacterium leprae*, an obligate intracellular parasite that affects peripheral nerves, skin and other organs.22 Neuropathy is the hallmark of leprosy, manifesting as motor, sensory and autonomic alterations.22–24 Nerve damage is the most feared complication in leprosy since it causes most of leprosy’s characteristic and stigmatizing disabilities. Even though declared to be eliminated from many parts of world including India, leprosy continues to remain a prevalent disease in certain endemic pockets. The majority of patients with leprosy report to their physicians with complaints of paresthesia and dysesthesia and a plethora of unpleasant sensations including those to the lower limbs. Many of them are not diagnosed as they are not taken seriously, or thought to be too mild, or are attributed to co-morbidities by the dermatologists. There is no specific data regarding prevalence of RLS among the different spectrum of leprosy even though it is considered as one of the important causes of peripheral neuropathy. Also data regarding the presence and amount of sleep disruption in leprosy-affected people with RLS is non-existent.

Materials and methods

We conducted a prospective study in a tertiary care centre from December 2013 to March 2014. All diagnosed cases of leprosy were included in the study. Those who complained of creeping, crawling or other uncomfortable feelings in the legs and arms which was relieved by rubbing or moving the affected limb and almost irresistible urge to move the legs, and having pain in their legs were subjected to the questionnaire of IRLSSG.

All leprosy cases having chronic diseases such as kidney failure, diabetes, and peripheral neuropathy, patients on certain medications that may aggravate symptoms like anti-nausea drugs (prochlorperazine or metoclopramide), antipsychotic drugs (haloperidol or phenothiazine derivatives), antidepressants that increase serotonin, and some cold and allergy medications that contain sedating antihistamines, patients who were pregnant and patients taking alcohol were excluded from the study.

Each patient was assessed face to face by single interviewer based on modified clinical diagnostic criteria of RLS, proposed by the International RLS Study Group (IRLSSG):
1) An urge to move the legs usually but not always accompanied by, or felt to be caused by uncomfortable and unpleasant sensation in legs; 2) The urge to move the legs and accompanying unpleasant sensations begin to worsen during periods of rest or inactivity such as lying down or sitting; 3) The urge to move the legs and any accompanying unpleasant sensations are totally or partially relieved by movement such as walking or stretching at least as long as activity continues; 4) The urge to move the legs and any accompanying unpleasant sensations during rest or inactivity only or are worse in the evening or night than during the day; 5) The occurrence of the above features are not solely accounted for as symptoms primary to another medical or behavioural condition (e.g. myalgia, venous stasis, leg edema, leg cramp, arthritis, positional discomfort, habitual foot tapping).

Only those patients who fulfilled the criteria of RLS were subjected to a 10-point questionnaire of the Pittsburgh Sleep Quality Index (PSQI) to assess their sleep quality.26

Data were analysed using statistical software SPSS 16.

Results

One hundred and forty-three patients diagnosed with leprosy were enrolled into the study (Figure 1).

Out of them 56 patients (39.16%) patients fulfilled the criteria of RLS (Table 1).

The mean age of patients with RLS was 42.018 years; 33 patients (58.9%) were female and 23 patients (41.1%) were male. RLS was found commonly in patients suffering from Type 2 reaction (26.8%), pure neuritic leprosy (25.0%) and borderline tuberculoid leprosy.

Data were analysed using statistical software SPSS 16.

Table 1. Demographic characteristics and Global PSQI score

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<table>
<thead>
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<tbody>
<tr>
<td>No. of patients with RLS</td>
<td>56/143(39.16%)</td>
</tr>
<tr>
<td>Mean age</td>
<td>42.018 years</td>
</tr>
<tr>
<td>Sex (M/F)</td>
<td>58.9%F, 41.1%M</td>
</tr>
<tr>
<td>PSQI global score</td>
<td>16.55</td>
</tr>
</tbody>
</table>
The mean PSQI global score was higher in leprosy patients i.e. 16.55. PSQI was specifically higher among patients suffering from lepra reactions and pure neuritic type leprosy (Tables 2 and 3).

Discussion

To date there is no data regarding prevalence of restless legs syndrome in different types of leprosy. In a study by Unruh et al. in 2004, prevalence of RLS among patients with chronic kidney disease was 15% with female preponderance. In our study prevalence of RLS among leprosy patients is 39.16% with female preponderance (Female – 58.9% and male – 41.1%).

In a study by Conner et al. in 2003 it had been proposed that there occurs impaired iron acquisition by neuromelanin cells in brain due to impaired transferring receptor regulation. Subjects of RLS have low serum and CSF iron and ferritin and transport of iron from periphery to CNS is defective (Mizuno et al. 2005). A decreased dopaminergic neurotransmission leads to moderate to severe RLS (Kim et al. 2012). Iron is a co-factor for the enzyme tyrosine hydroxylase which is the rate-limiting enzyme in the pathway of conversion from levodopa to dopamine. So decreased iron levels hamper the activity of tyrosine hydroxylase leading to decrease in dopamine synthesis and availability. Previous studies have demonstrated both a decrease in ferritin in CSF and a lower iron concentration in substantia nigra in RLS patients.

Leprosy patients suffer from iron deficiency anemia. In a study done by Lapinsky et al. it was found that mean value of serum iron level was significantly lower in untreated patients with active leprosy. Dapsone being a component in multi drug therapy (MDT) in leprosy can itself cause anemia thereby predisposing to development of RLS.

Peripheral neuropathy leads to secondary RLS. Leprosy being a condition with neuropathy as a central feature leads to RLS. In our study we found RLS more prevalent among patients with pure neuritic leprosy (PNL). In PNL the absence of cutaneous lesions leads to delay in seeking health care, diagnosis and thereby treatment. So the undiagnosed nerve injury is more profound at the time of presentation in patients with PNL leading to RLS.

Table 2. Proportion of RLS and mean PSQI in leprosy spectrum

<table>
<thead>
<tr>
<th>Leprosy spectrum</th>
<th>TT = 7</th>
<th>BT = 33</th>
<th>BB = 27</th>
<th>BL = 29</th>
<th>LL = 22</th>
<th>PNL = 25</th>
<th>Total = 143</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLS</td>
<td>0</td>
<td>11</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>14</td>
<td>56</td>
</tr>
<tr>
<td>% (out of total 56)</td>
<td>0</td>
<td>19.6</td>
<td>0</td>
<td>8.9</td>
<td>5.4</td>
<td>25.0</td>
<td>39.16</td>
</tr>
<tr>
<td>Mean PSQI</td>
<td>0</td>
<td>13.09</td>
<td>0</td>
<td>10.8</td>
<td>10.6</td>
<td>15.93</td>
<td>16.55</td>
</tr>
</tbody>
</table>

Table 3. Proportion of RLS and mean PSQI in lepra reaction

<table>
<thead>
<tr>
<th>Type of lepra reaction</th>
<th>Type 1 reaction = 21</th>
<th>Type 2 reaction = 34</th>
<th>Lucio phenomenon = 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>RLS</td>
<td>8</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>%</td>
<td>14.2</td>
<td>26.8</td>
<td>0</td>
</tr>
<tr>
<td>Mean PSQI</td>
<td>13.75</td>
<td>17.8</td>
<td>0</td>
</tr>
</tbody>
</table>
Also during lepra reaction there is severe inflammation and edema around the nerve which leads to neuropathic pain in leprosy patients attributing to RLS.

Another study done by Seong-Min Choi et al. in South Korea prevalence of RLS among leprosy patients was 25.4% with females being more prevalent. However, they did not compare the prevalence of RLS with respect to the different clinical spectrums of leprosy. In our study the prevalence of RLS was more and specifically higher among pure neuritic leprosy patients and patients having lepra reaction. However our study was comparable with them regarding sex preponderance.

Also in our study a higher prevalence of restless legs syndrome was found in leprosy patients (39.16%) as compared to the general population (1.9 to 15).

Restless legs syndrome affects the sleep quality severely and has been recognised as a cause of sleep impairment in 5–10% of the U.S population. RLS leads to multiple awakenings at night and is considered to be a leading cause of insomnia. Sleep impairment, although usually not voluntarily disclosed without direct questioning, is the main complaint described by those with RLS. In our study when leprosy patients with RLS were subjected to the Pittsburgh questionnaire the mean Pittsburgh global score was 16.55 which denotes that leprosy patients have a poorer sleep quality which is probably due to a higher prevalence of RLS in them.

References
Prevalence of restless legs syndrome in leprosy patients


