Published in final edited form as:

Sleep Med. 2009 October ; 10(9): 976–981. doi:10.1016/j.sleep.2008.09.015.

The four diagnostic criteria for Restless Legs Syndrome are unable to exclude confounding conditions (“mimics”)

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Abstract

Background—Epidemiological survey studies have suggested that a large fraction of the adult population, from 5 to more than 10%, have symptoms of restless legs syndrome (RLS). Recently, however, it has become clear that the positive predictive value of many questionnaire screens for RLS may be fairly low and that many individuals who are identified by these screens have other conditions that can “mimic” the features of RLS by satisfying the four diagnostic criteria. We noted the presence of such confounders in a case-control family study and sought to develop methods to differentiate them from true RLS.

Methods—Family members from the case-control study were interviewed blindly by an RLS expert using the validated Hopkins telephone diagnostic interview (HTDI). Besides questions on the 4 key diagnostic features of RLS, the HTDI contains open-ended questions on symptom quality and relief strategies and other questions to probe the character of provocative situations and modes of relief. Based on the entire HTDI, a diagnosis of definite, probable or possible RLS or Not-RLS was made.

Results—Out of 1255 family members contacted, we diagnosed 1232: 402 (32.0%) had definite or probable RLS, 42 (3.3%) possible RLS, and 788 (62.8%) Not RLS. Of the 788 family members who were determined not to have RLS, 126 could satisfy all 4 diagnostic criteria (16%). This finding indicates that the specificity of the 4 criteria was only 84%. Those with mimic conditions were found to have atypical presentations whose features could be used to assist in final diagnosis.

Conclusion—A variety of conditions, including cramps, positional discomfort, and local leg pathology can satisfy all 4 diagnostic criteria for RLS and thereby “mimic” RLS by satisfying the 4 diagnostic criteria. Definitive diagnosis of RLS, therefore, requires exclusion of these other conditions, which may be more common in the population than true RLS. Short of an extended clinical interview and workup, certain features of presentation help differentiate mimics from true RLS.

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Introduction

In recent years, there have been several studies of the prevalence of Restless Legs Syndrome (RLS) in different populations (1-5) using International RLS Study Group consensus diagnostic features (6). However, these studies have generally utilized questionnaires that were not validated on the same populations. Sensitivity (ability to detect affected individuals) and specificity (ability to exclude non-affected individuals) of diagnostic instruments have, therefore, been unknown. Only in one population study were questionnaire results confirmed by expert interview (7). Even in that study the confirmation was not independent since the expert interviewer utilized the responses to the 3-question diagnostic questionnaire as an element of the diagnostic process. The authors reported a kappa of 0.67 for agreement between the question set and the expert diagnosis (8), better than chance but not nearly perfect.

We have been developing a systematic procedure to diagnose individuals using a validated expert telephone diagnostic interview, a preliminary version of which had a sensitivity of .97 and a specificity of .94 in a mixed sample of RLS patients and controls (9). A more recent validation from our family case-control study shows a similar high sensitivity and specificity ($\geq 90\%$) (10) with use in a general population. We now report our experience with subjects in that case-control family study and examine in detail those who did not receive an expert diagnosis of RLS, but who endorsed one or even all 4 features that are the essential diagnostic features of RLS (6,11). Because the 4 diagnostic criteria are often the only criteria used in research questionnaires, it is important for us to understand the specificity, sensitivity, and positive predictive value of such limited questionnaires. Diagnostic instruments with low positive predictive values can lead to significant errors in estimating population prevalence of RLS and also determining medical and social effects of RLS. Individuals with “false RLS” may also enter into therapeutic and pathophysiologic studies of RLS and contaminate their results.

In this paper, we report our examination of the rate at which subjects without RLS can satisfy the basic diagnostic criteria for RLS. We also show how additional questions about symptoms, which are supplementary to the diagnostic criteria, can help discriminate true RLS from confounding conditions.

Methods

Study Procedure

Only the essential details are given below. For a more in depth description of the methods, see our previous publications (10,12). One hundred thirty-six patient probands were recruited from the clinics of the Johns Hopkins Bayview Medical Center while 59 control probands were recruited by patients or obtained from the local catchment area. Two RLS experts independently evaluated all the RLS and control probands in a standard clinical setting and only those with complete agreement on diagnosis were accepted. Control probands were also required to be free of excessive PLM as determined by 3 nights of actigraphy. The RLS and control proband groups were matched for current age and gender. In each case, diagnosis was confirmed before entry. All probands signed written consents to participate in the study and a verbal consent was obtained from all interviewed family members in accord with Hopkins IRB approval. A diagnostic interview was completed on 1232 family members of the probands. Diagnoses were made using the validated telephone interview (HTDI) (10) by an expert RLS clinician (WAH) who was unaware of the diagnosis of the family member's proband or the relation of the family member to the proband. Diagnosis was confirmed by a second expert (RPA, CJE, SRL). If there were uncertainties or any diagnostic disagreement, diagnoses were reviewed by the full panel of experts and a consensus reached.

The HTDI based its diagnosis initially on the four RLS diagnostic features:

1. an urge to move the legs
2. that is present at rest,
3. relieved by movement, and
4. demonstrates a circadian pattern with peak symptoms occurring at night or in the evening.

All subjects were asked about the first 2 features and also about leg discomfort at rest. If they had either an urge to move or leg discomfort at rest, they were also asked about features 3 and 4 and were further questioned in more detail about the type and description of their leg sensations, about the quality of the urge to move, leg cramps, effects of rest, leg position, and walking on leg sensations, methods used to obtain relief from symptoms, and effects of leg symptoms on sleep.

The final diagnosis depended on both the 4 diagnostic features and also on the answers to additional questions. Subjects who were diagnosed with RLS fell into 3 categories: definite, probable, and possible. RLS subjects who reported the four features and, in addition, associated uncomfortable leg sensations and significant leg symptoms when lying down were diagnosed as having “definite” RLS. Such subjects either lacking only the leg sensations or had no significant leg symptoms when lying down were classified as having “probable” RLS. For purposes of this study, both probable and definite RLS diagnoses are considered to represent RLS. Those who denied an urge to move the legs, but had unpleasant leg sensations at rest that were maximal in the evening or night and relieved by movement were classified as having “possible” RLS. For purposes of the present analysis (as in our segregation analysis (12)), these subjects were considered “unknowns.” The “unknowns” were not entered into any analyses in this paper.

In addition to those who did not endorse the 4 diagnostic features, we classified as Not RLS those subjects who could not indicate they had had leg symptoms once a month for 3 months or who, if having even less frequent symptoms, did not suggest a history of at least 20 lifetime episodes or RLS. It is likely that, at a later time, at least some of these individuals would have met our diagnostic criteria (see e.g. (10)).

All subjects were asked whether they had cramps, whether or not they initially volunteered this information. In addition, subjects who were hesitant or uncertain about endorsing leg symptoms at rest were encouraged to do so, even if the symptoms appeared “normal” or “unimportant” or not bothersome. Several questions were added during the course of the study in order to detect possible mimics – including the speed of relief with walking, the occurrence of symptoms or return of symptoms when walking, the duration of symptoms, whether symptoms only occurred with certain leg positions, and whether symptoms could be relieved by a single adjustment of posture. Later in the course of the study, the telephone interviewer began to make a tentative determination of the likely cause for conditions other than RLS that had led to positive responses to the basic RLS diagnostic questions. This allowed us to make a preliminary assessment of which conditions could lead subjects to contribute to false positive diagnoses by endorsing the diagnostic features of RLS.

In this process we identified the following 6 primary non-RLS conditions whose symptoms mimic those of RLS leading subjects to subscribe to all 4 diagnostic criteria defining RLS. We used the following to differentiate these mimics from RLS:

1. Leg cramps: It is not a great problem to determine whether an individual has cramps since this is a common term easily understood by most adults. However, the diagnosis

was confirmed by ascertaining the character of the symptoms. This was done under an open-ended question (describing the symptoms) that applied to all symptoms recorded as occurring at rest. We also note that most of the subjects had cramps and those with more typical RLS symptoms could easily distinguish those symptoms from cramps.

2. Peripheral neuropathy: The subjects were asked about the character of symptoms and such character as numbness was then queried further – the individual was asked about when the symptoms occurred, whether a diagnosis had been received, or whether they had diagnoses that commonly present with peripheral neuropathy such as diabetes.
3. Radiculopathy: individuals were specifically asked about sciatic pain or presented information about sciatic pain in the description of symptoms
4. Arthritic pains: In describing the symptoms, the specific location of symptoms within the limbs was probed. If individuals had symptoms confined to a joint that was tender and painful, or reported a general arthritic condition, we would consider the symptoms likely to be some pain condition, possibly arthritic, rather than RLS. In our experience, RLS symptoms are rarely confined to the joint region. The benefits of movement are usually not as rapid for other leg pains as they are for RLS.
5. Positional discomfort: We asked specific questions to ensure the symptoms occurred in most resting positions and not a specific body position such as crossed legs. We further asked if a single change in body position without further movement sufficed to relieve the symptoms and we sought to determine the duration of symptom expression while resting. A single movement may relieve positional discomfort and the problem would not come back, so the period of time with symptoms is short (often less than 5 minutes). RLS symptoms require more movement for relief and linger longer than occurs for positional discomfort.
6. Pronounced or frequent unconscious foot or leg movements (e.g., hypnic jerks, habitual foot tapping, leg shaking, general nervous movements): These were addressed both by specifically asking if the subject was aware of the urge to move the legs before moving them and whether or not the urge became difficult to resist. When there was uncertainty we would enquire about when they became aware of their leg movements, looking for the temporal relation between the movement and their awareness of it. RLS patients know they have to move and do not need to be told they are moving, or they discover it when they are startled by a sudden leg movement.

Subjects may have both RLS and a mimic condition also producing leg symptoms like RLS. We specifically sought to isolate and differentiate all resting symptoms in the limbs. Questions were then focused on the one symptom most consistent with RLS. When multiple symptoms were uncovered that could represent RLS, all questions were asked separately for each symptom.

Statistical Analyses

Our primary interest was evaluating the characteristics of those subjects who subscribed to all 4 basic diagnostic criteria for RLS and therefore would have been classified as RLS if only those 4 questions were used. We refer to these as the “Mimic group.” We compared the Mimic group to those who were not only subscribed to the 4 questions diagnosing RLS but also passed the differential diagnosis as RLS (RLS group). We examined the rate of mimics by their family status (control or RLS proband). We also analyzed the RLS group compared to the Mimic group for differences in gender and age and in responses to the critical questionnaire items designed to detect confounding conditions. The analyses were t-tests for the continuous data (age) and chi-square for the dichotomous rate data.

Results

Characterization of the subjects' responses to the four basic criteria

Out of a total of 1232 family members with a diagnosis, 788 (64%) were diagnosed as not having RLS (Not-RLS group). Of these 788, 347 reported leg discomfort at rest (44%) and 336 reported an urge or need to move the legs while at rest (43%). Four hundred seventy-six reported at least one of these symptoms (64%) while 207 (26%) reported both discomfort and an urge to move. Among those with at least an urge to move at rest (N=336), 291 (37% of the Not RLS group) reported relief with movement and 126 (16% of the Not-RLS group) also reported a nighttime accentuation of symptoms, meeting 4 out of the 4 diagnostic criteria for RLS. Without any additional considerations, these 126 subjects would have been falsely classified as having RLS. From point of view of accurately predicting RLS, of the 528 subjects who met the 4 basic criteria for RLS, 402 subjects were diagnosed as having RLS (definite and probable combined) and 126 (24%) were considered to definitely not have RLS.

The percentage of relatives satisfying the 4 criteria was similar in case (17%) and control (14%) family members. Evaluation of the subjects who met all 4 diagnostic criteria showed that the subjects with confirmed RLS (RLS group) and those who were found not to have RLS (Mimic group) had similar ages (RLS vs. mimic averages: 50.4 vs. 51.6; $t=0.68$, 525df, $p=0.49$) but differed in gender. While 64% of the RLS subjects were female, only 44% of the Mimic group were female (chi square = 14.85, $p<.001$). This difference was consistent for both case and control family members. Of the 126 cases in the Mimic group, a tentative cause for the confounding symptoms was made in 67. The suspected diagnoses are indicated in Table 1. The most common confounding variable was some leg discomfort with the most common condition being positional leg discomfort/ischemia (74%), followed by leg cramps (16%), leg injury/arthritis (11%), and nerve damage (5%). Of the 67 subjects, 13% had more than one confounding condition, so the overall percentage is greater than 100%. Of note, 8 (6.3%) of the subjects in the Mimic group had otherwise typical RLS symptoms but had not satisfied our frequency criteria

Responses differentiating Mimic group from the RLS group

Additional questions were integrated into the questionnaire with the purpose of improving its overall specificity. The response rate to these questions for the Mimic versus the RLS groups can be seen in Table 2.

Leg Cramps—610 of 634 individuals (96.2%) who were explicitly asked whether they had experienced cramps indicated that they had. This did not differ between diagnoses: 97% of RLS, 95% of Mimics, and 96% of the remainder of those without RLS had cramps. Overall, 15 subjects with cramps as the sole leg complaint at rest met all 4 diagnostic criteria. In all, 97 diagnosed family members reported leg symptoms that were always due to cramps (because this meant they were in the Not-RLS group, many of them were not further asked about relief with movement or evening/night predominance). These 97 make up 7.9% of all subjects receiving a diagnosis.

Pain—Once a subject endorsed having unpleasant feelings in the legs, they were asked if these feeling were painful. Subjects who only reported an urge to move were not asked this question. Mimics were more likely than RLS subjects to indicate that symptoms were painful (47% versus 22% respectively, chi square = 17.07, $p<0.001$).

Irresistible symptoms—Subjects were asked if their reported leg symptoms were so overwhelming that they were compelled to move. Seventy-six percent of RLS subjects, but

only 42% of the mimics, reported that symptoms were irresistible (chi square = 29.84, 1 df, $p < 0.001$).

Toleration of restraint—Only 10% of the RLS subjects said that restraining circumstances would be tolerable, while 43% of the Mimic group felt no concern about symptoms worsening with restraint (chi sq= 7.31, $p < 0.01$). Among the RLS subjects, 16% said they would feel upset or agitated, 14% panic or anxiety, 11% would feel crazy, and 37% would find it very unpleasant.

Rapid relief—The majority of both RLS (88%) and Mimic (91%) subjects reported that symptoms resolved either almost immediately or soon after walking began. There was no significant difference between the two groups.

Specific position—Subjects were asked if their symptoms only occurred if their legs were in a specific position. Subjects in the Mimics group were more likely to report that symptoms occurred in a specific position than those in the true-RLS group (48% versus 11%, respectively, chi sq = 29.49, $p < 0.001$).

Change of position—Subjects were asked if their symptoms could be reliably relieved by a single postural shift without continued movement. Only 12% of RLS group indicated that this would usually provide relief, compared to 56% in the mimic group (chi sq = 42.98, 1df, $p < 0.001$).

Longer duration of symptoms—Subjects were asked how long symptoms lasted until they no longer needed to act to relieve them. Among those with RLS, 83% indicated symptoms would last more than 10 minutes, compared to 29% of mimics (chi sq = 39.04, $p < 0.001$). Further, 38% of RLS subjects indicated that symptoms lasted more than an hour, compared to 17% of mimics.

Return while walking—Neither the symptoms of RLS subjects (1%) nor those of mimics (7%) returned while walking after some relief had been obtained (chi sq=1.62, 1 df, $p = 0.20$).

Occur while walking—Symptoms that occur during walking are infrequent for both RLS subjects (3%) and for mimics (12%) (chi sq=1.07, 1 df, $p = 0.30$). The RLS subjects who reported symptoms all agreed that the symptoms never started while walking; one mimic stated that symptoms “rarely” began while walking.

Sleep Problems—We also asked subjects if they had difficulty getting to sleep when they first went to bed and if they had difficulty getting back to sleep if awakened. If they indicated such problems, they were asked if this was due to their leg symptoms requiring them to move around. Considering all causes for sleep problems, RLS subjects were more likely to report difficulties going to sleep (72% vs. 38% for Mimics; chi square = 42.12, 1df, $p < .001$) and more difficulties getting back to sleep if awakened during the night (71% vs. 51% for Mimics; chi square = 14.24, 1 df, $p < .001$). Indeed, RLS subjects reported 56% of the time that they had difficulty both going to sleep and returning to sleep compared to 27% of those from the Mimic group (chi square = 28.26, 1df, $p < .001$). Eighty-seven percent of RLS subjects had at least one sleep problem (getting to or returning to sleep) compared to 58% of Mimics (chi square = 44.13, 1df, $p < .001$).

Sleep Problems Due to Leg—RLS subjects were also more likely to attribute any difficulty getting to sleep to their leg symptoms (57% of those with difficulty getting to sleep compared to 27% of Mimics, chi square = 13.00, 1df, $p < 0.001$). Similarly RLS subjects were more likely to attribute any difficulty getting back to sleep to their leg symptoms (54% of those with

difficulty returning to sleep compared to 18% of Mimics, chi square = 22.67, 1df, $p < .001$). Overall, 29% of RLS subjects when asked about sleep, indicated that their leg symptoms both interfered with getting to sleep and returning to sleep (compared to 6% of Mimics, chi square = 27.44, 1df, $p < 0.001$).

Chronicity—RLS tends to be a chronic disorder, with progression to a more severe symptomatology in those who become patients (11,13). We found no significant difference, however, between the RLS and mimic groups in those whose symptoms had lasted more than 10 years (60% of RLS, 51% of mimics, chi sq = 2.77, 1df, $p = 0.10$).

Frequent symptoms—We defined as frequent those who had symptoms at least half the time (16 or more times a month). There was no difference between the RLS (28%) and mimic (30%) groups in frequent symptoms (chi sq = 0.08, 1df, $p = 0.77$).

Discussion

In this study we found that symptoms and conditions not related to RLS can frequently satisfy one or more of the features characteristic of Restless Legs Syndrome. The most common factor leading to endorsement of RLS features was the presence of leg discomfort not caused by RLS. Among the conditions frequently responsible for endorsement of RLS features are cramps, positional leg discomfort, and leg pain due to a variety of injuries or pathologic conditions; some subjects endorsed different features due to distinct conditions. While we found that as many as 16% of subjects who we judged not to have RLS could satisfy all 4 diagnostic features, we studied a non-clinical population. We would predict that a diagnosis of RLS in specific clinical populations with leg symptoms (neuropathy, arthritis, spinal cord conditions, or upper motor neuron disease with leg spasms) using only the 4 diagnostic features could lead to an even higher rate of false positive diagnoses.

The findings of this study suggest an important limitation of diagnostic instruments based solely on the subject report of only the four RLS diagnostic features. It also shows that adding questions designed to detect mimics can produce an instrument with satisfactory accuracy for most clinical studies. It needs to be recognized that demonstrating the 4 diagnostic criteria is just the first step of diagnosis. A full diagnosis requires a careful differential diagnosis that can exclude other confounding conditions. While the frequency of endorsing RLS diagnostic features may vary with the instrument and procedures used to assess them, it is certain that questionnaire surveys will find individuals who endorse RLS criteria symptoms but do not have RLS. This has been shown in previous studies, which followed a questionnaire by a direct expert interview (14,15). In a population study that relied on diagnosis using the 4 features, the positive predictive value could easily be less than 50%. The magnitude of this effect remains to be determined for any specific instrument, but based on the findings in this study, it could be considerable. In our study, with a specificity of 84% and assumed sensitivity of 100%, the positive predictive value associated with the use of the 4 criteria alone was 76%. However, our study was highly enriched with RLS subjects (402 of 1232, 32.6%) because of the predominance of relatives of RLS case probands. In a population with RLS rate of 10%, the positive predictive value would fall to 41% with such specificity. Because we used a structured, but open-ended interview with expert administration, it is difficult to make precise predictions since subjects may respond differently to different instruments, due to variations in wording, mode of administration, or social and cultural factors. It is well known that translating the RLS features into different languages can cause significant difficulties due to idiosyncrasies of each language and its use. Based on these considerations, we strongly recommend that future studies validate any instrument used to diagnose RLS to determine the sensitivity, specificity, and positive predictive value for the population in which they intend to use the instrument.

We note that there are certain limitations to our study. First, the majority of our family members were related to RLS probands and this may have introduced a bias due to their likely sharing of environmental or genetic influences with their RLS proband. Second, because of smaller numbers, the control contrasts between RLS-diagnosed and mimic family members were usually not significant. But we also note that the differences, while almost always in the same direction, were generally also weaker in the control family members. This may indicate some substance to the limited generalization of our results. It will clearly be profitable to study the diagnostic issues raised by RLS mimics in general clinical or population samples.

It is important for clinical care that those receiving the treatments now available for RLS (16-18) be correctly diagnosed. Scientific studies or therapeutic trials need to exclude false positive subjects whose inclusion may contaminate results. And those diagnosing RLS must be sure that the diagnostic features are satisfied by a single condition. Our results support the hypothesis that additional probing of symptom features can help discriminate true from false RLS. Other approaches to strengthening the diagnosis of RLS – or at least clinically relevant RLS – have included the use of supportive or associated features (6). These efforts use either electrodiagnostic methods (polysomnogram or suggested immobilization test based (19)) related to the supportive feature of increased periodic limb movements or pharmacologic methods (levodopa therapeutic challenge (20)) related to the supportive feature of dopaminergic responsiveness. But these methods have not been tested on samples of clinical or general populations. They also require an additional intervention with professional monitoring, i.e., trained personnel to interpret PSG or SIT records or physicians to order and supervise the administration of a dopaminergic medication.

Based on the answers to our supplementary questions, several tentative generalizations can be made about the differences between true and false RLS. First, RLS symptoms are persistent; they are not fleeting. Second, while they share with mimics provocation solely by rest and rapid relief with movement, they are not readily relieved by a simple postural change. Third, RLS symptoms are dependent on rest in general, more than any specific position, so they are not associated with specific provocative postures. Fourth, RLS symptoms are compelling: restraint and confinement can be extremely distressing to those who have them. Finally, sleep dysfunction is very common in those with RLS and is frequently attributed to their leg symptoms. This confirms the notion that sleep dysfunction is an associated feature of RLS (6). It has, of course, been observed in previous studies that sleep complaints are very common in those who report RLS symptoms (21,22). On the other hand, we did not find that a more chronic course (>10 years with symptoms) or frequent symptoms (16 or more times a month) discriminated between the RLS and mimic groups. In neither group did symptoms persist or begin during walking.

Although our study is an initial investigation, we believe that it provides some important clues on how to discriminate RLS from mimics. Questions based on the major distinctions between RLS and mimics, as detailed in the preceding paragraph, can be used to enhance diagnostic instruments. Specific questions aimed at eliminating certain mimics, such as cramps, may be useful. Our conclusion is stronger because many of the subjects we diagnosed had infrequent symptoms (less than once/week) and were not only those who were RLS sufferers (with RLS twice a week or more frequently and reporting that symptoms were bothersome)(2,22). The additional questions of the HTDI should allow for improved differential diagnosis in a remote interview without the necessity for face to face questioning and can be used in epidemiological studies where it is possible to ask more than a minimum set of 3 or 4 questions. This should help increase specificity and positive predictive value. In one validation study using a specific question on cramps in a subject completed questionnaire, a specificity of 93.5% was obtained along with a positive predictive value of 85.5% in a non-clinical population (Allen et al.,

Validation of the self-completed Cambridge-Hopkins questionnaire (CH-RLSq) for diagnosis of the restless legs syndrome (RLS), [unpublished observations].

Acknowledgments

This study was supported by NIH grant RO1 AG 16362 which was awarded to Dr. CJ Earley and NIH/NCRR grant M01-RR00052 received by the Johns Hopkins-Bayview GCRC.

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Table 1

Individuals without RLS satisfying the 4 RLS diagnostic criteria(mimics) given a different

Condition	Number Diagnosed
Cramps	15 *
Positional Discomfort	34
Local leg injury/arthritis	7
Positional ischemia (numbness)	12
Nerve damage (neuropathy, radiculopathy)	3
Sleep transition phenomena (e.g. hypnic jerks)	4
Leg shaking, jitters	4
Generalized nervousness	2
More than one mimic condition	8

Table 2

Responses differentiating True RLS from Mimics

	RLS N/Total	Mimics PercentN/Total	Percent	Significance CHI SQUARE
Pain	82/366	23% 34/73	47%	**
Irresistible symptoms	163/215	76% 34/82	42%	*
Tolerance of Restraint	6/63	10% 6/14	43%	**
Rapid relief	182/207	88% 64/70	91%	n.s.
Specific posture	16/140	11% 27/56	48%	***
Change of position	17/142	12% 36/64	56%	***
Longer Duration of symptoms	98/119	83% 12/42	29%	***
Return while walking	2/152	1% 3/42	7%	n.s.
Occur while walking	3/87	3% 4/34	12%	n.s.
Sleep Problems	299/345	87% 69/119	58%	***
Sleep Problems Due to Legs	100/345	29% 6/119	5%	***
Chronicity	160/400	60% 60/118	51%	n.s.
Frequent symptoms	111/401	28% 34/115	30%	n.s.

(note owing to the sturcutured nature of the questionnaire the numbers (Total) differ for those answering each of the questions)

RLS Subjects diagnosed as either Definite or Probable RLS by HDTI -- numbers vary because different numbers were asked specific questions.

Mimics Subjects who answered positively to questions based on 4 RLS diagnostic features, but were judged not to have RLS -- numbers may vary because different numbers of subjects were asked specific questions.

N/Total Number of subjects endorsing a question/total who were queried and gave a definite answer (those who said don't know were not included)

Pain -- subjects were asked if leg discomforts they experienced while sitting or lying were painful

Irresistible symptoms -- subjects were asked if their symptoms were so overwhelming that they were compelled to move to relieve them

Tolerance of restraint -- subject indicated that he would be able to tolerate or not be much bothered by having to maintain a single fixed position

Rapid relief -- subjects were asked when they began to experience relieve when they started to walk

Specific posture -- subjects were asked if symptoms began in a particular posture

Change of position -- subjects were asked if a single change of position would relieve symptoms

Long duration of symptoms -- subject's estimate that it required more than 10 minutes for symptoms to be relieved without continued movement

Return while walking -- subject's reply to question of whether symptoms would return while walking continued

Occur while walking -- subject's reply to whether symptoms would ever occur while walking

Sleep Problems -- any problem in initiating sleep or returning to sleep when awakened

Sleep problems due to legs -- subjects who reported that leg symptoms were responsible both for difficulty initiating sleep and for difficulty returning to sleep when awakened

Chronicity -- subjects report symptoms have lasted more than 10 years

Frequent symptoms -- subjects report symptoms occur at least half the time (16 or more days per month)