

# Chronic Insomnia: An Actigraph Evaluation

**M Bhatia, N B Shivplara**

Sleep Medicine Centre, Sir Ganga Ram Hospital, New Delhi

## ABSTRACT

Insomnia is one of the most common sleep disorders. Evaluation includes a detailed history, with sleep logs. Overnight sleep study is an expensive, inconvenient test to perform, whereas actigraphy is an easy tool which can be used for prolonged periods. We present a preliminary report of use of actigraph in 5 patients of Chronic Insomnia and their correlation with history.

**Keywords:** Insomnia, PLMD, Actigraphy

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## Introduction

Insomnia, one of the most common sleep disorders, is a symptom rather than a disease and is characterised by an inadequate amount of sleep or impaired quality of sleep (1,2). Insomnia is defined as difficulty with initiation, maintenance and decreased duration or quality of sleep, that results in impairment of daytime functioning, despite adequate opportunity and circumstance for sleep (3,4). In one survey, 35% of adults between the age of 18 and 79 yrs. complained of insomnia (5). The National Institute of Mental Health (NIMH) consensus conference in 1984, divided insomnia (6) into –transient (1week) short –term (1-3 weeks) and chronic (>3 week). Chronic Insomnia-insomnia lasting for more than 1 month (7) has a prevalence of 10-15% (4, 3) and occurs more frequently in women, older adults and patients with chronic medical and psychiatric disorders (1, 2). Consequences include fatigue, mood disturbances, problems with interpersonal relationships, occupational difficulties, and a reduced quality of life. Evaluation of insomnia includes a comprehensive history, physical examination with sleep

logs/diaries structured questionnaires, supplemented by specific structural interviews, polysomnography, actigraphy and other evaluation tools.

Actigraphy is the newer technique that can be used as an adjuvant to diagnose/evaluate insomnia (8). It is the technique of quantifying and recording movements, which indirectly reflect the awake and sleep states (9). With this, the patients total sleep duration, sleep onset time and any significant movements during sleep can be assessed. In the present study, patients with insomnia were evaluated with history and actigraphic evaluation.

## Material and Methods

The study group included 5 patients with chronic insomnia. All the cases for the study were recruited from Department of Sleep Medicine, Sir Ganga Ram Hospital, New Delhi. Cases were evaluated by detailed history and clinical examination using a pre-designed questionnaire. These comprised of patient's demographic details, clinical history related to insomnia such as duration of complaint, exact nature of complaint– sleep onset/sleep maintenance or early morning awakening, other coexisting conditions (Depression/ anxiety) and direct questions for Restless Leg Syndrome, Periodic Leg Movement Disorder or other associated medical conditions. Details of treatment were also noted. All were given an actigraph (PAM-RL, Version: 7.6.0 IM systems) (Fig. 1) and clearly explained the use of the instrument. The patient was asked to tie it above the

*Addresses for correspondence:*

**Dr. Manvir Bhatia**

Sir Ganga Ram Hospital, Rajinder Nagar

New Delhi- 60

Fax: 011-25751002,

Email: manvirbhatia1@yahoo.com

Telephone No.: 42251728, 42251731



Fig 1: The Actigraph (PAM-RL)/ IM systems

ankle joint and press the button when he goes to bed and also on waking up in the morning. The total duration of recording was from 24 hrs to 2 days. The data was downloaded using the accompanying software and Periodic Leg Movements were calculated as per the guidelines (10). Sleep onset and wake time were noted. (Fig.2)

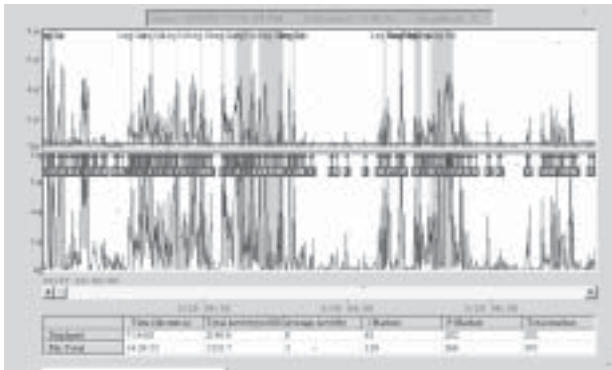


Fig 2: Overnight Summary of Actigraph Recording

**Results**

There were 5 patients with insomnia, 3 males and 2 females, with mean age 33.25 SD ± 1.25 yrs. The disease duration in patients ranged from 1 year to 5 years. Among 5 cases, 4 complained of delayed sleep onset, 2 presented with fragmented sleep and 1 had early morning awakening. Three patients had coexisting anxiety with depression. Details of patients demographic history, sleep related complaints and treatment taken, are given in the Table 1.

Actigraph was given to each patient for at least one

**Table 1**

S.No	Age	Sex	Chief Complaints			Co-morbidity	Duration (yrs)	Current Treatment
			LOS	Frag Sleep	EMA			
1	33	F	+	-	-	Anxiety	5	T. Alprazolam, T. Clonazepam
2	32	M	+	+	-	-	3	T. Clonazepam
3	33	M	+	-	+	Depression & anxiety	1	T. Zolpidem T. Zolpidem T. Zolpidem
4	31	F	-	+	-	-	3.5	T. Clonazepam T. Clonazepam T. Clonazepam
5	33	M	-	+	-	Depression	2	T. Clonazepam T. Mefenidol

LOS : Latency of Sleep Onset  
 Frag. Sleep : Fragmented Sleep  
 EMA : Early Morning Awakening

night. Actigraph recording revealed 4 patients with delayed sleep onset, 3 patients with increased movements throughout night and 4 cases with early morning awakening. 2 patients fulfilled the criteria for diagnosis of Periodic Leg Movement Disorder. The details of actigraphy are shown in the Table 2.

**Table 2**

S. No	Actigraphy			PLM/hr
	Sleep Latency	Movts throughout Night	Early Morning Awakening	
1	3-4 hrs	++	-	3.7
2	1-2 hrs	-	+	1.73
3	30 min	-	+	1.4
4	4-5 hrs	++	+	9.1
5	2-3 hrs	+	+	16.4

Out of 3 patients in our study who complained of delayed sleep onset, 2 patients had increased sleep latency based on actigraphy. In another two patients, with no similar complaint increased sleep latency was detected. Though 3 patients complained of disturbed sleep throughout the night, 2 had poor sleep but 1 had adequate sleep. Two patients had early morning awakening with similar history. Periodic Leg Movement Disorder was seen in 2 patients with no significant history.

**Discussion**

Insomnia is the second most common overall complaint (after pain) reported in primary care setting (11). Insomniacs have highly variable sleep patterns, often alternating excellent nights with very poor ones in an unpredictable sequence. The lack of standardized criteria pose a significant obstacle to the assessment of insomnia. In recognition of this problem the research diagnostic criteria for insomnia was formulated by the AASM work

group (12) and a standard research assessment of insomnia was prepared by BUYSSSE (13). Methods for evaluation may include basic history with physical examination, sleep logs/diaries, Polysomnography, actigraph or other evaluation tools (8).

In our study, actigraphy was used as an additional tool for evaluating the sleep patterns in five patients with insomnia. Actigraphy was successfully used to evaluate sleep latency, total sleep time with number of awakenings, and early morning awakening. The validity of actigraphic assessment of sleep in insomnia has been documented in a number of publications (14,15). Actigraphy can supplement the initial evaluation consisting of history, physical examination, and sleep diary for the better diagnosis of sleep disorders. With its ability to assess sleep/wake patterns, actigraphy can be useful in the evaluation of circadian rhythm patterns such as delayed sleep phase syndrome. Valliers and Morin (16) demonstrated actigraphy to provide a more accurate data than sleep diary when compared to Polysomnography, and that it was sensitive to the effects of treatment.

Limitations of the present study are – small number of patients, actigraphic recording for small duration of 1-2 nights and no comparable study with Polysomnography. Though the use of actigraphy, is not indicated in the routine diagnosis, assessment or management of any of the sleep disorders by AASM as insomniacs can remain inactive for prolonged periods in an attempt to sleep, actigraphy is a useful, non-invasive tool that can be used as an adjuvant to other modes of evaluation. Actigraphy is ideal for extended examination of sleep-wake cycle because it is convenient and is readily accepted by patients. It can be used to supplement sleep logs and to evaluate unusual complaints such “I have not slept for several nights”. In addition, it can identify the cause of insomnia so that appropriate treatment can be provided.

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