



## **PATIENTS WITH DISTURBED BIORHYTHM AND SECONDARY BENEFICIAL EFFECT OF MELATONIN**

Jeetendra Kumar Gupta<sup>1</sup> and Ashok Kumar<sup>2</sup>

<sup>1</sup>Department of Pharmacology, GLA Institute of Pharmaceutical Research, Mathura, U.P. – 281406, India.

<sup>2</sup>Department of Pharmaceutical Sciences, Birla Institute of Technology, Mesra, Ranchi. E-mail: [jkgupta81@rediffmail.com](mailto:jkgupta81@rediffmail.com)

### **ABSTRACT**

The present study was designed to educate the students of B.Pharm 2<sup>nd</sup> year of GLAIPR about the understanding of the secondary effects of a drug. To attain the skill of awareness about the secondary effects, an exercise on prescription audit was introduced as a teaching learning strategy, for which drug cum neurohormone melatonin was selected. A survey study was designed to analyze the prescribing pattern of melatonin in patients of disturbed biorhythm.

Total 84 patients of disturbed biorhythm were surveyed, out of which 36 patients (42.8%) received benefit in their learning-memory, migraine or depression (SAD) discomforts besides they got a significant relief in their wake-sleep disorder.

Thus, the present study supports the secondary beneficial effect of melatonin along with its prime importance as 'biological clock synchronizer'.

**Keywords:** Biorhythm, Melatonin, Sleep Disorder.

### **INTRODUCTION**

Exogenous melatonin is used as chronobiotic for the treatment of disturbed biorhythms and sleep disorder, however recently it is also seen to reduce tissue damage in experimental rats<sup>1</sup>. Chemically, melatonin is an indole derivative N-acetyl-5-methoxy tryptamine which is found in human and in other organisms including algae<sup>2</sup>. It is also an endogenous moiety biosynthesized by pinealocytes in pineal gland of brain and important in the regulation of circadian rhythm of several biological functions<sup>3</sup>. Since melatonin secretion declines with age, it is claimed that melatonin supplementation may retard ageing.

The present study was carried out to explore the additional benefit of exogenous melatonin against migraine, seasonal affective depression (SAD) and learning-memory disorders along with its primary function. The melatonin is known

as 'synchronizer of biological clock'. Recently it has been seen that melatonin has capacity to prevent death of neuroblastoma cells exposed to Alzheimer amyloid peptide<sup>4</sup>. In experimental rats, it also reduces tissue damage. It crosses blood-brain barrier and acts as a powerful antioxidants<sup>5</sup> and has significant free radical scavenger activity<sup>6</sup>. In pre-clinical study, melatonin enhances cytokine production<sup>7</sup> and may be beneficial in acquired immuno deficiencies.

Thus, the objective of the present study was to investigate the other beneficial activity of melatonin besides its primary function (synchronizer of biological clock).

### **MATERIAL AND METHOD**

The 2<sup>nd</sup> year students of GLAIPR were divided into 12 groups, each group consisting of 4-5 students. Then each group was asked to collect at least 30 prescriptions of registered physicians and

specialists of their regions containing melatonin within a period of one year. Since the melatonin containing prescriptions are rare hence one year of period was decided for the study. After one year, a total of 84 prescriptions were collected from the different corners of India.

### **Design of study**

One year patient-survey was performed through physicians and community pharmacists in the Indian hospitals based on melatonin prescription with the patients of disturbed biorhythms, wake-sleep disorders, learning-memory disorders, migraine and depression (SAD).

Questionnaires were asked to the patients, parents (in case of child patient) and also to the concerned physicians.

Questionnaires were based on the relationship between melatonin administration with age, wake-sleep time, depression (SAD), migraine and learning-memory problems.

Finally the results were analyzed to see the effects of the drug.

### **RESULTS**

In one year period from Feb 2008 to Feb 2009, a total of 84 patients were included in this study. Among these 35 patients discontinued their treatment for unknown reasons, 31 patients (36.9%) got significant relief in their wake-sleep disorder, 21 patients (25%) & 13 patients (15.5%) got relief in their migraine and memory disorders, whereas only 8 patients (9.5%) had an improvement in their learning disorder and the effect of melatonin in depression (SAD) was

extremely minimal or negligible. Overall, 42.8% patients got relief in their sleep, learning, memory, depression and migraine discomforts, whereas 14 patients (16%) did not get any improvement with melatonin treatment. The effect of melatonin was more beneficial in children as compared to adults.

The result in detail is given in Table 1, 2 and 3. The results of present study suggests the melatonin is mainly effective in wake-sleep disorder, however it has also some beneficial effect on learning, memory, migraine and depression (SAD) problems along with its prime benefit as 'biological synchronizer'.

### **DISCUSSION**

Melatonin is a neurohormone as well as a drug which is used as chronobiotic for the treatment of disturbed biorhythm in human. As a neurohormone, it is biosynthesized by pinealocytes in pineal gland of brain in early stage and its secretion declines with age. The established and prime action of exogenous melatonin is the improvement and cure of sleep disorder in disturbed biorhythm patients, for which it is world wide known. In present study the secondary beneficial effects of exogenous melatonin was studied with the help of a survey report.

The survey was performed under teaching-learning strategy by the students of B.Pharm 2<sup>nd</sup> year of GLAIPR. From the observation, it was evident that the drug melatonin has many secondary effects along with its prime importance as biological clock synchronizer.

**Table 1: Effects of melatonin in surveyed patients**

| S.N. | Patient Discomfort               | No. of Benefited Patients |                | Total no of Surveyed Patients |                | Benefited Patients / Total Patients |
|------|----------------------------------|---------------------------|----------------|-------------------------------|----------------|-------------------------------------|
|      |                                  | ≤12 yrs of age            | >12 yrs of age | ≤12 yrs of age                | >12 yrs of age |                                     |
| 1.   | Wake – sleep disorder / Insomnia | 08                        | 23             | 14                            | 70             | 31 / 84<br>(36.9%)                  |
| 2.   | Depression (SAD)                 | 00                        | 01             | 00                            | 12             | 01 / 12<br>(8.3%)                   |
| 3.   | Migraine                         | 06                        | 15             | 14                            | 70             | 21 / 84<br>(25%)                    |
| 4.   | Learning disorder                | 08                        | 00             | 14                            | 70             | 08 / 84<br>(9.5%)                   |
| 5.   | Memory disorder                  | 08                        | 05             | 14                            | 70             | 13 / 84<br>(15.5%)                  |

**Table 2: Observation in children**

| Common Discomforts   | Benefited Patients<br>(≤12 yrs of age) | Total Patients<br>(≤12 yrs of age) |
|--|--|------------------------------------|
| Migraine +Wake-Sleep disorder / Insomnia<br>+ Learning / Memory disorder | 06                                     | 14                                 |
| Wake- Sleep disorder / Insomnia<br>+ Learning / Memory disorder          | 02                                     | 14                                 |

**Table 3: Observation in adults**

| Common Discomforts                                | Benefited Patients<br>(≤12 yrs of age) | Total Patients<br>(≤12 yrs of age) |
|---|--|------------------------------------|
| Migraine + Memory disorder                        | 04                                     | 70                                 |
| Migraine + Wake-Sleep disorder / Insomnia         | 11                                     | 70                                 |
| Wake-Sleep disorder / Insomnia + Depression (SAD) | 01                                     | 70                                 |

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**Appendix**

**SURVEY FORM TO ASSESS THE SECONDARY BENEFICIAL EFFICACY OF MELATONIN TREATMENT ON PATIENTS WITH DISTURBED BIORHYTHM**

New Patient / Melatonin treated Patient

1. Name of Patient: \_\_\_\_\_
2. Date of treatment: \_\_\_\_\_
3. Important Symptoms:
  - i) Wake-Sleep disorder      Yes / No      Improvement Yes / No  
(for treated patient)
  - ii) Insomnia      Yes / No      Improvement Yes / No  
(for treated patient)
  - iii) Depression (SAD)      Yes / No      Improvement Yes / No  
(for treated patient)
  - iv) Migraine      Yes / No      Improvement Yes / No  
(for treated patient)
  - v) Learning disorder      Yes / No      Improvement Yes / No  
(for treated patient)
  - vi) Memory disorder      Yes / No      Improvement Yes / No  
(for treated patient)
4. Dose of Melatonin (prescribed):  
3 mg OD (at bed time)      Treatment is continued Yes / No  
6 mg OD (at bed time)      (for treated patient)  
Any other dose:- \_\_\_\_\_
5. Comment of Physician / Pharmacist / Nurse / Parents:  
Improvement  
No improvement  
Any other comment:- \_\_\_\_\_

**Signature**

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