



Retinal Changes in Melatonin Consuming Patients Using Electroretinography

KEYWORDS

Sleep disturbances, Melatonin, Retina, Electroretinography.

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ABSTRACT

Aim: sleep disturbances is a complication observed in elderly population. Melatonin is a drug to treat these patients. It is reported that this treatment may produces visual problems. The aim of present research is to look for probable retinal changes in melatonin consuming patients using Electroretinographical technique.

Methods: thirty patients with different period of melatonin prescription were selected for the purpose of present study. They were classified in four groups according to the period of drug medication. Flash ERG was used as a technique to check the retina of these patients. Latency (m sec) and Voltage (μv) of ERG, b wave were recorded for each patients. The values obtained were compared with the normal population (control) to see for the possible differences between two groups.

Results: It is observed that melatonin increases the latency of b wave of ERG, where as it does not effect the amplitude of b wave significantly.

Conclusion: It is already reported that increase in latency of ERG, b wave is the result of early deep retinal degeneration, so one can conclude that Melatonin produces deep retinal degeneration which can be diagnosed by measuring the latency of ERG, b wave, which will be discussed in detail in full paper.

Introduction:

Melatonin is a substance found in animals, Plants, fungi and bacteria. It is also a hormone that can control sleep and wake cycles in human beings, therefore this hormone can be used as sleep aid and in treatment of some sleep disorders. It can be taken orally as capsules, tablets or liquids [1]

Beside melatonin usefulness in sleep disorders, It may have certain side effects. Day time sleepiness, headaches, dizziness, abdominal discomfort, mild anxiety, irritability, confusion and short-lasting feeling of depression are among the reported side's effects of this drug [2]

Visual system is among the organs that can be affected due to melatonin prescription. It is reported that long-term use of melatonin may cause irreversible damage to the retina of the eyes. [3]

To check the retina of the visual system, there exist some specific techniques. Electroretinography (ERG) is one of the electrophysiological technique which check the functional status of the retina [4] Therefore in present study we selected the melatonin consuming patients & record Electroretinography in total patients to check the safety of this drug.

Method:

Twenty four patients with different period of melatonin prescription were selected for the purpose of present research study. The patients under study were in age range of 30-60 years. The routine visual checking of the patients were normal, the only problem was their visual acuity, which was corrected by suitable lenses. The patients were classified in four groups according to the period & dose of drug medication.

Conventional flash Electroretinography was tested in total population. Mangoni Electrophysiological machine capa-

ble of recording visual evoked potential (VEP), Electrooculography (EOG) and finally Electroretinography (ERG) was used for the purpose of present work. Three electrodes i. e. active, reference and ground were used to connect the patients to the recording machine. Active electrode was a contact lens placed on sclera, reference and ground electrodes were connected to earlobe and forehead respectively.

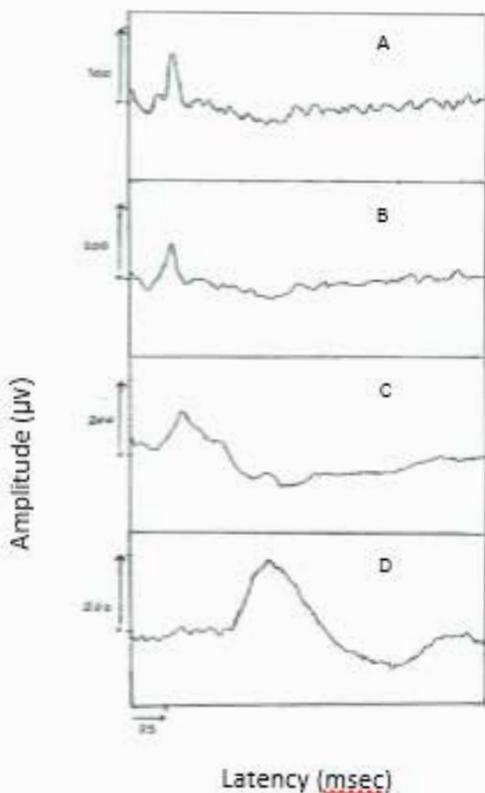
Amplitude (μv) & latency (msec) of ERG, b wave were measured for each patients. Finally means & standard deviations were calculated for four groups. The same procedure was followed for 24 normal population with the same patient's age range & normal visual system.

The results obtained in case & control groups were compared to search for the possible statistically differences results in the respected groups. SPSS, version 13 was used for this purpose.

Results:

Table 1, Measurement of latency (msec) & Amplitude (μv) of ERG, b wave for different period of melatonin prescription.

Years of Consumption ERG, b wave parameters	Control	2	4	>6
Latency	30.4	31_	36.6	96.8
S.D.	0.48	0.89	0.8	1.83
Amplitude	104.66	115.7	117.74	259.8_
S.D.	10.23	12.52	8.88	181.90



Graph 1, is the sample ERG patterns in following cases.

1-A - ERG pattern in a normal subject with amplitude 85.2 μ v and latency 30 msec

1-B - ERG pattern in a 2 year melatonin consuming patient with amplitude 132.4 μ v and latency 30 msec

1-C - ERG pattern in a 4 years melatonin consuming patient with amplitude 107.7 μ v and latency 36 msec

1-D - ERG pattern in a 7 years melatonin consuming patient with amplitude 215.8 μ v and latency 97 msec

It was observed from table 1 that Amplitude in all four groups are normal i.e. We could not find statistically difference in Amplitudes of four groups & the control one, where as in latencies of two last group we observed statistically differences in latencies ($P < 0.05$) between the patients & control groups.

Discussion:

Melatonin is a drug which its prescription is increasing due to increase in age of the world population & anxiety due to change of life style. In fact these two factors influencing the sleeping behavior of the people & melatonin may be a suitable drug to solve these problem.

According to the results obtained we could not find significant differences between the amplitude of **b** wave in two groups. In fact it is reported that amplitude of ERG **b** wave originate from muller & bipolar cells [5] of retina therefore it is concluded that these two layers are not affected due to melatonin consumption.

Referring to the results there is a statistically significant differences between latencies of ERG **b** wave, of case & control groups, especially when melatonin is prescribed for a

longer period. It is a fact that delay in latency of ERG **b** wave is an indication of early deep retinal degeneration [6] thereby melatonin produces early deep retinal degeneration which can be avoided by termination of melatonin in time.

Conclusion:

From the result of present study one can conclude that melatonin produces deep retinal degeneration especially it consumed for a longer period of consumption.

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