Comparison of Electroretinorgraphical Patterns in Retinitis Pigmentosa and Choloroquine Consuming Patients.

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ABSTRACT *Aim: The present study was planned out to compare the electroretinorgraphical patterns in Retinitis pigmentosa & choloroquine consuming patients, and thereby to search for possible changes obtained in retina of these two type of patients.*

Method: In a descriptive-analytical study 25 patients with definite Retinitis Pigmentosa diagnosis and 25 choloroquine consuming patients with certain retinal degeneration which is the side effect of long term choloroquine intake were selected. Photophic Electroretinography was recorded in two groups. The amplitude (μv) and latency (msec) of b wave of ERG patterns were calculated, in these two case groups. ERG was also measured in 25 normal population with healthy visual system i.e. control group. The b waves of ERG patterns in two case groups were compared with control group to look for retinal changes obtained in two patient groups.

Results:

Mean amplitude (μv) and latency (msec) of ERG b were calculated in two case groups and the obtained mean values were compared with the mean amplitude and latency of control group.

The mean amplitude ± S.D. & latency ± S.D of ERG b wave in control group were 104.8 ± 15.29 & 42.6 ± 1.78 respectively.

The mean amplitude ± S.D. and latency ± S.D of ERG b wave of RP patients were 32.6 ± 10.36 and 42.9 ± 2.48 respectively.

The difference between mean amplitude of b wave of ERG patterns is significant as for as RP patients are concerned where as the mean latency is not statistically significant between case & control groups.

The mean amplitude ± S.D. & latency ± S.D of ERG b wave of choloroquine consuming patients were 106.2 ± 12.79 and 61.7 ± 13.39 respectively. The difference between mean latency of b wave of ERG is statistically significant as far as choloroquine consuming patients are concerned, where as the mean amplitude is not significant between two case and control groups.

Conclusion:

The result of present work is a clue that ERG pattern, mainly b wave is useful to diagnose the retinal changes take place in RP and choloroquine consuming patients.

Introduction

Retinitis pigmentosa (RP) is an inherited degenerative eye disease that causes severe vision impairment and often blindness. The progress of RP is not consistent. Some people will exhibit symptom from infancy, other may not notice symptoms until later in life. Generally the later the onset, the more rapid is the deterioration in sight [1-2].

A form of retinal dystrophy, RP is caused by abnormalities of the photoreceptors or the retinal pigment epithelium (RPE) of the retina leading to progressive sight loss. Affected individuals may experience defective dark or light adaptation and some cases nyctalopia as a result of degeneration of the peripheral visual field [3-4]. Sometimes, central vision is lost first causing the person to look sidelong at objects. RP can be inherited in an autosomal dominant, autosormal recessive, or X-linked manner. X-linked RP can be recessive, affecting primarily only males or dominant, affecting both males and females, although males are usually more mildly affected. Some digenic and mitochondrial forms have also been described. [5] The prevalence Rate of RP is approximately 1 in 35000 people in world. [6]

Beside RP which affect retinal layers in visual system there are some drugs which degenerate retinal layers. Choloroquine which is an antimalarial drug it is usually used in treating some rheumatoid patients like arthritis, lupus and etc may degenerate retinal layers mainly retinal pigment epithelium (RPE) [7].

To diagnose the retinal layers disturbances in these patients i.e. RP and choloroquine consuming, different techniques such as perimetry, colour and contrast sensitivity and finally Electroretinorgraphy (ERG) is used [8], Therefore in present study we planned a research on retinal layers of such patients using ERG technique and compared the pattern obtained to look for ERG changes in these patients.

Method:

In a descriptive- analytical study we selected 50 patients randomly. Twenty five with definite RP and twenty five choloroquine consuming patients with certain retinal layer degeneration. The patients were prepared for ERG examination, i.e. they were pre dark adapted for thirty minutes then photopic ERG was performed in total patients population. These two groups were taken as case groups. Beside case population, twenty five people with normal visual system mainly retina were selected as a control group.

ERG was recorded in healthy population; Amplitude (µv) and latency (msec) of ERG **b** wave were measured in total case and control groups. Mean and standard deviation were calculated for each group. To analyze the data obtained SPSS software was used.

Results:

In present research work approximately equal number of male and female population were selected as a control group i.e. 12 male and 13 female subjects. ERG patterns obtained in two groups does not show significant changes. The reason for this type of selection i.e. equal number of male & female is because in case group the maximum number of RP patient were male and choloroquine consuming patients were female.

The age range in three groups was approximately the same i.e. between 20 to 30 years. ERG was recorded in three groups i.e. control, RP and choloroquine consuming population. Amplitude (µv) and latency (msec) of ERG, **b** wave were measured for each subject. Mean Amplitude and latency of ERG, **b** wave were obtained in each group.

Table 1. Mean amplitude ± S.D. and latency ± S.D measurements of ERG b wave in RP and choloroquine consuming patients.

ERG parmeters Group	Amplitude (µv) ± S.D	latency (msec) ± S.D.
Control	104.8 15.29	42.6 1.78
RP patient	32.6 10.36	42.9 2.48
choloroquine consuming patient	106.2 12.79	61.7 13.39

The mean amplitude ± S.D. & latency ± S.D. of ERG **b** wave in control group were 104.8±15.29 and 42.6±1.78 respectively.

The mean amplitude ± S.D. and latency ± S.D. of ERG **b** wave of RP patients were 32.6±10.36 and 42.9±2.48 respectively. The difference between mean amplitude of **b** wave of ERG is significant as far as RP patients and control group are concerned where the difference between mean latencies is not statically significant as far as case and control groups are concerned.

The mean amplitude ± S.D. and latency ± S.D. of ERG **b** wave of choloroquine consuming patients were 106.2±12.79 and 61.7±13.39 respectively. The difference between mean latency of **b** wave of ERG is statistically significant as far as choloroquine consuming patients and control population are concerned; where as the mean amplitude is not significant between case and control groups.

Discussion

Electroretinography or ERG is an electro diagnostic technique to show the status condition of retinal layer. In present study ERG patterns were obtained in retinitis pigmentosa (RP) and choloroquine consuming patients and compared with normal ERG pattern to look for possible changes among these groups.

According to the results obtained, there is a significant change between the amplitude of **b** wave of ERG pattern in RP and normal group. It is a well known fact that **b** wave of ERG, following pre dark adaptation arises from rod cells in retina, Thereby one can conclude that in RP patients the rod degeneration occur, and hence significant fall in amplitude of ERG b wave of these patients [9].

In choloroquine consuming patients there is a significant delay in latency of ERG **b** wave in comparison with healthy retinal condition of control group. It is also a fact that delays in ERG **b** wave or broad ERG **b** wave is an indication of early deep retinal changes, therefore in choloroquine consuming patients with definite retinal changes, there is a delay in **b** wave of ERG pattern [10].

In a research done by David et al on 1982, they reported the fall in amplitude of ERG **b** wave in RP patients which supports the result of present study [11].

Matti and his colleagues worked on 24 RP patients using ERG technique and reported fall and delay in amplitude and latency of ERG **b** wave respectively. The difference between present work and Mattis work is on latency of ERG **b** wave, the reason may be due to later stage of rod degeneration in their patients [12].

In a research done by Browning DJ on choloroquine consuming patients using mfERG, they came to conclusion that mfERG is not a suitable technique to show the early retinal degeneration which is in contradiction with the result of present work. The reason for this contradiction may arise from the fact that they have not considered the patients with definite retinal disturbances which may be caused by choloroquine consumption [13].

Conclusion

From the result of present work one can conclude that ERG is a suitable technique to diagnose the retinal disturbances in RP and choloroquine consuming patients, but one should take into consideration that RP patients produces ERG **b** wave with reduced amplitude mainly in early stage of retinal degeneration and in other hand the ERG **b** wave is delayed in latency as far as choloroquine consuming patients are concerned.

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