

## Effect of Mefloquine on Eye

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### ABSTRACT

**Objective:** To study the effect of mefloquine on visual status.

**Patients & Methods:** Sixty nine confirmed cases on weekly Mefloquine therapy (for malaria prophylaxis) for 01 year were included in the study. Visual acuity, intraocular pressure (IOP), anterior and dilated posterior segment examination and visual fields (VF) were carried out to determine the ophthalmic status.

**Results:** Out of 69 patients, 2 were found to have pain and mild blur in visual acuity. However none has disc, VF, fundus, and anterior or posterior segment retinal changes. Mean age of subject was 43 years. 58 (84.05%) were males and 11 (15.94%) were females.

**Conclusion:** There seems to be no risk of visual loss after Mefloquine therapy for 01 year. Moreover further study is required to assess more long-term use risk.

**Key words:** Mefloquine, Presbyopia, Antimalarials, Retinal toxicity

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### INTRODUCTION

Mefloquine is a drug, which has been brought in use for prophylactic treatment of malaria as an alternative medicine having been considered more effective instead of chloroquine being prescribed and in use in the past few decades. During further study carried out by UN mission in the recent past it transpired that general public had probably developed myth against the use of mefloquine considering this drug as an injurious medicine and if used may cause damage to retina. This apprehension may not be correct, however this needed still further study and deeper research to confirm the suitability and effectiveness of the subject drug as it is used by human beings and to save the human life is the prime duty of all those persons attached with manufacturing of drugs or treatment of patients. Although in other studies on the subject medicine it has been noticed that the use of this medicine did show adverse side effects on various tissues of the body but no specific or exclusive study has ever since been carried out on the side effects of this medicine on retina.<sup>1-5</sup> Since there is no evidence available of this drug on retinal toxicity this study was carried to assess its effect on visual apparatus and nullify the impression of myth.

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### PATIENTS AND METHODS

This descriptive study was carried out in the eye department at tubmanberg country hospital Liberia from December 2006 to December 2007. Sixty nine confirmed cases that were put on weekly mefloquine therapy for 01 year were included in the study. For malaria prophylaxis, mefloquine is given as a 250-mg tablet once weekly. Patients attending the eye OPD were examined on slit lamp after taking their visual acuity by snellen acuity charts. Patients having diabetes, hypertension, cataract, any other pre-existing disease or other prophylactic treatment and extreme age 70 plus were excluded from study. Then on slit lamp anterior segment examination was carried along with tonometry for baseline record. Posterior segment dilated examination was carried out with 90 D lens. A drop of pilocarpine was instilled at the end of examination. Thereafter patients were followed at 3 monthly intervals for 01 year on mefloquine therapy. Same procedure was followed on each visit. To determine the adverse effects, percentage was calculated for demographic status, visual and glaucoma status and effects on fundus.

### RESULTS

Sixty nine confirmed cases that were put on weekly mefloquine therapy for 01 year were included in the study from out patient department at Tubmenburg country hospital Liberia. There were 58 (84.05%) males and 11(15.94%) females (Table 1). Correctable visual acuity ranges from 6/6 to 6/12.

Intraocular pressure ranges between 10-18 mm of Hg. Cup disc ratio varied from 0.3 to 0.5. Patient age ranges from 20 to 65 years with mean value of 43 years. Visual functions were affected in 2 cases out of 69 (2.89%) who complained of blurred vision and eye pain. No VF defects were noted. None had associated anterior or posterior segment changes. None had increase or decrease intraocular pressure (Table 2).

Table 1: Socio demographic profile of subjects

Sex	Frequency	Percentage
Male	58	84.05
Female	11	15.94

Table 2: Distribution of cases according to visual status after 1 year mefloquine therapy

Adverse effects	Visual status affected no of cases	Effect on visual status cases in %age
Eye pain	2	2.89
Blur vision	2	2.89
Intraocular pressure	-	-
Retinal toxicity	-	-

## DISCUSSION

Mefloquine is U.S. Food and Drug Administration (FDA) approved for the treatment of malaria<sup>6</sup>. There are five approved drugs available for malaria chemoprophylaxis. These are mefloquine, doxycycline, atovaquone-proguanil (Malarone), chloroquine, and hydroxychloroquine sulfate. Of these, only mefloquine, chloroquine, and hydroxychloroquine sulfate have sufficiently long half-lives to permit weekly dosing<sup>7</sup>. Weekly dosing enhances compliance with prophylactic dosing regimens. However, resistance of malaria parasites to chloroquine and hydroxychloroquine sulfate has become extremely widespread<sup>8</sup>. Consequently, mefloquine, doxycycline, and atovaquone-proguanil are most commonly used for malaria prophylaxis. When given for malaria prophylaxis, mefloquine is given as a 250-mg tablet once weekly<sup>7</sup>.

Unfortunately, mefloquine has also been associated with neurological sequelae, including anxiety, panic attacks, suicidal ideation, nightmares, sleep disturbances, dizziness, tremor, headache, mood changes, and fatigue<sup>1,2</sup>. These effects generally occur more frequently at the treatment dose, even in the absence of malaria, than at the prophylaxis dose<sup>2,3</sup>. The reported incidence of adverse events after mefloquine administration is variable<sup>4</sup>.

Common side effects of mefloquine include nausea, vomiting, dizziness, insomnia, abnormal dreams, hallucinations, and blurring of vision.

Although the long-term use of mefloquine may be associated with ocular lesion in rats,<sup>5</sup> retinal disorders are not described in long-term human users. An extensive PubMed search using the search terms [mefloquine] and [eye disorder], [retinal disorder], revealed no relevant reference. Interestingly, a Google search using the search terms [mefloquine] and [visual field defect] revealed a reference<sup>9</sup> in which a patient was described, who had been taking mefloquine for 18 months for the chemoprophylaxis of malaria and was found to have bilateral changes in the retinal pigment epithelium of the macula. In contrast in our patients, no visually significant, changes occurred after the long-term use of mefloquine. A recent study published in this journal, another eye disorder optic neuritis was reported once among 1,876 Japanese peacekeepers in East Timor who used mefloquine for malaria chemoprophylaxis for 6 months.<sup>10</sup> In our study although two patients complain of mild blurring of vision and eye pain but detailed ophthalmic examination revealed no anterior or posterior segment abnormality.

Concern has been raised about adverse effects due to mefloquine prophylaxis. Since our literature search and study failed to identify a single case of optic neuritis or retinopathy associated with mefloquine, these conditions may have been coincidental rather than a result of the chemoprophylaxis. Of more concern are neuropsychiatric adverse effects, and a diverse range of neuropsychiatric symptoms have previously been reported among mefloquine users<sup>11</sup> including severe depression<sup>12</sup> and acute psychosis.<sup>13</sup> Due to the nature of these adverse effects, however, causal relations were often not confirmed. Various environmental factors including stress from international travel, tropical climates, or arduous mission might also play a part, or they might be due to antimalarials, but not specifically to mefloquine<sup>14</sup>. Recently, in a noncomparative study, a high incidence of adverse effects was reported among Japanese travelers using mefloquine prophylaxis<sup>15</sup>. However, the severity of these was not clarified.

Consistent with previous data from US Peace Corps volunteers<sup>16</sup> one of the JSDF studies<sup>17</sup> and an expert review<sup>11</sup>, the current study showed that most of the AEs due to mefloquine prophylaxis appeared during the first few doses and tended to decrease thereafter. Early appearance of AEs is advantageous since it may allow changing to an alternative antimalarial before departure. In view of the above discussion, although some adverse effects on the tissues of human body especially CNS did occur during malarial prophylaxis with mefloquine in various studies but no significant side effects on retina have

ever come to the light in our study. Therefore this drug may currently be brought in use and there is no hesitation in further study and long term research is progressively continued.

## CONCLUSION

There is no risk of visual loss after Mefloquine therapy for 01 year. Further study is required to assess more long-term use risk. However mefloquine can be used safely up to 01 year under regular supervision and follow-up ophthalmic visits. The use of mefloquine is a safer drug and the apprehensions that it may cause some adverse effects on eye are not proved so far in our study/ research. Yet there is no harm if further research is continued to achieve conclusive results.

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