

CHRONIC HEADACHE-DIGITAL FUNDUS CHANGES IN EMMETROPIC TEENAGE AND ADULT PERSONS

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ABSTRACT: Chronic headache is one of the commonest medical problem worldwide. 10-15 % of people are suffering from headache. Ocular headache is also one of the main cause for headache. The aim of this study is to find out clinical changes in the retina and in the optic nerve by digital fundus photography and by slit lamp fundus examination. 500 cases of headache with 13 to 38 years of age who have no refractive error are studied. Nidek Afc 210 auto focus and auto tracking digital fundus camera was used for taking fundus photographs and Nidek slit lamp with 135D mainster wide field lens of Ocular instruments. Inc was used. Out of 500 cases, 45% are males and 55% are females. 30% persons are from 13 to 20 years of age and 45% of persons are between 20 to 30 years of age and 25% of persons are from 30 to 38 years of age. 60 % of persons are from rural area and 40% of persons are from urban area. 80% of headache patients are having engorged and tortuous veins on optic disc and on retina. Mild to moderate arteriolar narrowing is present in 60% of persons. 80% of persons are having capillary insufficient and thin areas in the mid peripheral and in the peripheral retina. 70% of all headache patients are having eye strain. Cup disc ratio is more than 0.5 in 12% of headache patients. So, every case of chronic headache patient should be examined by non mydriatic digital fundus photography to know the changes in the optic disc and in retina for proper diagnosis and treatment.

KEYWORDS: Chronic headache, Migraine, Ophthalmic migraine, Ocular migraine, Optic disc changes in headache, Digital fundus changes in headache, Digital photography of eye, Retinal examination.

INTRODUCTION: Every person will be affected with headache one day or other day in his life in the present world. Nearly 10% to 15% of general population throughout the world are suffering from chronic headache. According to WHO 15% to 18% of women and 6% of men are suffering from headache in USA. Eye strain can cause and contribute to recurrent headaches. Nowadays even school going children are also suffering from headache due to their education, computer work, television viewing, late night sleeping, pollution and due to various improper food habits.

All headache patients in this study are emmetropic persons i.e they are not having any refractive error. It is very important that all these persons should be relieved of headache by proper diagnosis and treatment.

AIM: To find out clinical changes in the retina and in optic nerve by digital fundus photography and by slit lamp fundus examination.

MATERIAL AND METHODS: In our patients we have selected 500 cases of headache who have no refractive error. Age of selected persons is from 13yrs to 38 yrs. Nidek AFC 210 Auto Focus and Auto Tracking Digital fundus camera was used for taking fundus photographs and Nidek slit lamp SL 40 with 135 D Mainster wide field lens of Ocular Instruments. Inc was used to see the entire retina by

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slit lamp. In all patients intra ocular pressure was measured with Topcon non contact tonometer and refractive error was examined by Topcon Autorefractometer and subjective verification was also done by manual trial set lenses.

RESULTS: 500 cases of headache were studied. Out of this 45% are male patients and 55% are female patients. 45% of persons are between 20 to 30 yrs of age, 30% persons are from 13 to 20 yrs of age and 25% persons are 30 to 38 yrs of age. 60% persons are from rural area and 40% persons are from urban area. 50% persons are having one side headache and another 50% persons are having diffuse headache. In 70% of all headache patients eye strain is present. 10% of the patients are computer users. On examination hyperemia of optic disc is present in 60% of persons, 80% of headache patients are having engorged and tortuous veins. Cup disc ratio is more than 0.50% in 12% of headache patients. Even in early teenage children these increased cup disc changes are seen. Mild to moderate arteriolar narrowing is present in 60% of persons, 80% of persons are having capillary insufficient and thin areas in the mid peripheral and in the peripheral retina. In peripheral retina so many thin and dark areas are present. Different geographic type of pale colour and dark pinkish orange colored areas are present in the mid peripheral and peripheral retina. 2% of patients are having mild to moderate papilledema.

In 15% of patients the capillary veins are tortuous upto the ora serrata region. In 20% of patients there is a perivascular white sheathing along with arteries and veins in the peripheral retina. In 30% of patients peripapillary gliosis present and in 30% of patients gliosis is present along with temporal arcades upto one-third of their length. In 15% of cases the disc is smaller than normal, in 10% of cases the optic disc is more than normal size. Along with both temporal and nasal side arcade veins there is a thin retina. In 50% of cases temporal to the macula the retina is thin and dark. The intraocular pressure is high normal range in 30% of patients and in 10% of patients it is more than 21 mm hg.

DISCUSSION: Chronic headache is called when it is present for more than one year and remission is less than one month. Nowadays 10-15% general population are suffering from headache. The headache is named in as Tension headache, Migraine headache, General headache, Ocular migraine, Cluster headache (headache behind the eye). Majority headache patients are not aware of going to ophthalmologist for testing their eyes even though 20 to 30% of headache is due to ophthalmic causes. Most of them are going to neurologist without any eye test. In USA 3 million headache patients who attended emergency department when examined by non mydriatic digital fundus photography abnormal fundus changes like hyperemia disc, hemorrhages, engorged veins, exudates, papilledema are observed in 8.5%-10% of patients.

In our brain nearly 100 billion neurons are present and one million nerve fibres are present in optic nerve which are interconnected with almost entire brain. In our body 75 to 80% of all information reached to the brain is from eyes only. Even during sleep there is a rapid eye movement stage and depending on the light and dark conditions in eyes leads to stimulation of sleep centres via specialized 2 or 3 thousand nerve fibres from the retina to brain.

The blood vessels are seen directly only in retina, by seeing and estimating the status of the vessels on the retina and optic disc we can roughly estimate the status of blood vessels in the vital

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parts of the body like brain, heart, kidney and other parts. So many persons who have not got relief of headache from neurologists came to ophthalmologists and relieved their headache by spectacles, eye drops etc.

Digital fundus examination clearly delineate the retinal vessels and the retinal areas with high magnification for good analysis. Even probable strokes in the brain and heart can be predicted many years before their occurrence. The dilated veins shows that there is a decreased circulation in the retina, this means less oxygen supply to the retina causing more strain to the eyes leading to headache.

Due to reduced circulation the retinal areas gradually become thin and atrophic and from these hypoxic areas so many known and unknown toxic substances and inflammatory substances are released into the retina, to the circulation and around blood vessels and nerves in the brain sending irregular signals from the retina to the brain causing headache. Vasospasm of retinal circulation and vasospasm of ophthalmic artery occurs in ocular migraine. Retinal arteriolar constriction and pale optic disc are seen in early stages of headache and hyperemia of disc in late stages of visual changes in headache patients. During the episode of visual loss constriction of both arteries and veins over the optic disc are observed. Delayed arterial filling was also observed during fluorescein angiography test. Retina around macula becomes pale during the attack of headache and two hours after the relief of headache the retina becomes normal in appearance and this is established by digital fundus photography (E DOYLE, B J VOTE, Br J OPHAL). In ocular migraine there is a chance of permanent loss of vision or scotomas due to spasm of retinal blood vessels. Chronic headache can cause extreme stress on eye muscles and so they are forced to work harder causing eye strain leading to tired eyes, dry eye, blurred vision and headache.

Eyes move nearly 1,20,000 times per day, so even small and minute differences in the chorioretinal circulation leads to enormous changes in the ultimate function of brain leading to headache. When the brain gets tired it will be manifested in the form of headache and other bodily functional disturbances, that is why eyes are called external projections of brain.

Computer usage and television viewing cause light radiation effect on the retina, reduced movements of eyes, dryness of eyes, photophobia, hyperemia of optic disc leading to severe eye strain and headache. Headache patients are sensitive to light, sound, smell and sometimes nausea and vomiting may be associated. Lack of sleep, smoking, alcohol, perfumes, emotional stress, foods containing monosodium glutamate can trigger headache.

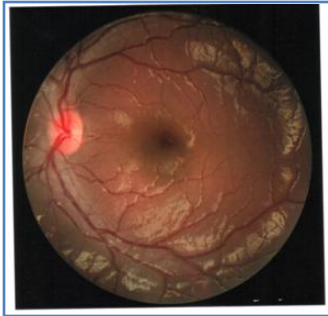
With normal direct ophthalmoscope we can see 10 to 30 degrees of retina only and it also needs training. Indirect ophthalmoscopy is having very less magnification and so minute details are not good, OCT will have cross section analysis of very less areas of retina and morphological colour differences are not clear. Slit lamp examination with 135D Mainster lens is very good to see the entire retina in detail with high magnification but this also needs training, this slit lamp test along with digital fundus photography gives good details about retinal nerve fibre layer, retinal vessels and optic disc. Digital fundus photography is very simple, easy, quick, documentation is easy and can be sent to anywhere in the world by telemedicine and can be performed by nurse or any ophthalmic technician and it takes 3 to 5 minutes only and can be done without pupil dilatation. Therefore digital fundus examination by non mydriatic fundus camera gives so much information about the retina and optic nerve and vessels in very high magnification. So every headache patient should undergo ophthalmic examination along with digital fundus photography.

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It is an eye opener for all ophthalmologists.

REFERENCES:

1. International Headache Society, Cephalalgia, May 2004;vol 24:pp 23-136.
2. Hedges, T. Yanoff. M., Duker, J. S., eds. Ophthalmology, 3rd ed.
3. Migraines-Mathew Lawrence, MD PhD, Simmons Lessell, MD DJO(Digital Journal of Ophthalmology) Oct 2013.
4. Retinal Migraine:caught in the act-E Doyle, B. J Vote, A. G. Casswell- Br J Ophthalmol 2004 February;88(2):301-302.
5. Feasibility of Non-Mydriatic Ocular Fundus Photography in the Emergency Department:Phase 1 of the FOTO-ED Study-Beau B. Bruce, MD, MS, Cedric Lamirel, MD, Valerie Biousse, MD et al-PMC 2012 September 1 NIH Public access.
6. Non Mydriatic Ocular Fundus Photography among headache patients in an emergency department-Praneetha Thulasi, BA, Clare L. Fraser, MD, Valerie Biousse, MD, David W. Wright, MD et al 2013 American Academy of Neurology.
7. Ocular Migraines(Ophthalmic or Eye Migraines) by Marilyn Haddrill-All About Vision 2007.
8. Headache Disorders. WHO Media Centre. Fact sheet 277. March 2004.
9. Migraine:An Ophthalmologist's perspective. Current Opinions in Ophthalmology. June 2003.
10. Chronic Daily Headache-Rashmi B. Halker, MD, Eric. V. Hastriter, MD and David W. Dodick, MD-Neurology February 15 , 2011 vol 76 no. 7 supplement 2 s37-s43.



Hyperemia disc and engorged veins



Increased Cup Disc ratio



Engorged, tortuous veins and arteries and increased cup disc ratio



Hyperemia disc and peri papillary gliosis and peri vascular gliosis with engorged veins

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