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OCULAR HEADACHE.

BY

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1900.

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THE HISTORY OF THE

REIGN OF

CHARLES THE FIRST

BY JOHN BURNET

OCULAR HEADACHE.¹

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THAT eye-strain is a cause of headache is a fact which is generally known, but I am quite certain that its importance as a frequent cause of this distressing symptom is not sufficiently appreciated.

Stevens² reports that in 100 consecutive cases of chronic headache in which the eyes were examined, he cured 61 by correcting the ocular defects. Gould³ says that out of 1,500 cases in private practice he found 75 per cent of all headaches, and 95 per cent of sick headaches, were due to eye-strain. Whilst not attaching too great importance to statistics constructed on such a narrow basis, they at least serve to illustrate, in a graphic way, the great frequency of eye-strain as a cause of chronic headache. I am quite certain we are keeping well within the limits of safety, when we say that of the cases of chronic headache met with in ordinary practice, at least 50 per cent are due to eye-strain.

It is therefore a matter of considerable importance for the general practitioner to be able to detect the ocular origin of a headache, both for his patient's comfort and for his own reputation. Many of these cases are not recognised because the connection between the headache and the eyes is not always manifest, and is often entirely unsuspected by the patient. Hence, it will be of value to the practitioner to know what clinical experience teaches regarding the characteristics of these ocular headaches. Such knowledge may help to prevent him from falling into the serious error of submitting his patient in vain to a long course of medical treatment,

¹ Read at a meeting of the Glasgow Medico-Chirurgical Society held on 5th October, 1900.

² *Functional Nerve Diseases*, 1887, p. 48.

³ *Ophthalmic Review*, vol. x, p. 280.

instead of giving him the immediate and permanent relief which follows in such cases from the prescription of suitable glasses.

But here I would give a word of warning. Never send such patients direct to the optician. Send them either to the hospital or the surgeon's private consulting room, where the refraction can be accurately measured. How often have I seen patients coming into my consulting room with an extensive collection of spectacles, which they had gradually amassed in their visits to the various opticians, and all to no purpose. The accurate measurement of refractive errors, and the prescription of suitable glasses, is a task often demanding great knowledge and judgment, which can only be satisfactorily accomplished by the ophthalmic surgeon.

Headaches due to eye-strain vary much in position, in character, and intensity. Sometimes it is only a slight dull pain, or a feeling of weight and heaviness, but sometimes it amounts to pain of a very intense character. In some cases the pain in the head is so persistent and severe as to cause grave apprehension of some intracranial disease, but usually the ocular headache is described by patients as a dull, heavy ache. The position of the pain also varies greatly. Some describe it as superficial, others as deep-seated. It may be frontal, temporal, vertical, or occipital, and I have even seen cases of pain at the back of the neck due to eye-strain. The most common seat of ocular headache is undoubtedly the frontal region just above the orbits, but it is met with in all situations. Hemispheres due to eye-strain is not common, but I have met with several cases of it.

In many cases of ocular headache, the patients complain of discomforts in or about the eye, such as a sense of heaviness or burning in the lids, a feeling of soreness in the globe of the eye, or a deep-seated pain at the back of the orbit. When such symptoms are present, the discomforts in or about the eye draw attention to the probable origin of the headache, and thus help greatly in the diagnosis. But it should not be forgotten that there are cases of headache of undoubted ocular origin where there are no discomforts whatever in the eye. These are the cases in which the true cause of the headache is frequently not discovered until after many years of suffering on the part of the patient. Hence, it is important to bear in mind the fact that the complete absence of subjective eye-symptoms does not at all exclude the possibility of an ocular origin of the headache.

But even in such cases there is one characteristic in the history of the headaches, which should arouse a suspicion in the physician's mind that the headaches may be due to eye-strain. I refer to the fact that, in ocular headaches, the pain is nearly always brought on, or, if persistent, is intensified by the use of the eyes. This is a point of great importance, and should always be enquired into very carefully. If a patient, suffering from chronic headache tell us that on the Sunday, when being away from business, he has little reading or writing to do, his headache is always much better, or perhaps entirely disappears, then suspect that it probably is of ocular origin. If a lady inform us that whenever she goes out shopping, looking in at the windows and examining different articles in the shops, she always returns home with a racking headache, then suspect that this headache also is of ocular origin. Whenever you find that the headache is brought on or intensified by the use of the eyes, or relieved or ameliorated by resting them, then always strongly suspect eye-strain is the probable cause.

But although headache due to errors of refraction depends directly upon the extent to which the eyes are used, in some cases the headache assumes a curious paroxysmal character. The patient may use his eyes continuously for near work, and yet suffer from one or two attacks only during the week. Such headaches may be extremely severe, sometimes accompanied by vomiting, and may even interrupt the patient's work. They resemble an attack of megrim, but they differ from true megrim in their bilateral distribution, and in the absence of any of the higher visual phenomena, such as fortification figures, or defects in the visual fields.

When our suspicions are aroused as to the ocular character of the headaches, we should at once proceed to examine the patient's acuteness of vision with the test-types. Here I would remark the utter uselessness of asking the patient if there is anything wrong with the sight. I have had patients frequently assure me that they had excellent vision, and when they were examined with the test-types it was found that their vision was very defective. A large number of patients suffering from astigmatism, for example, are not aware that their acuteness of vision is below normal, because, their affection being congenital, they possess the same acuteness of vision which they always had, and have no standard of comparison to test it by, until they are brought to the test-types. It is difficult sometimes to convince such patients that

their vision is not so good as they imagine it to be. I have met with many striking examples of this class.

A few years ago a friend of my own, on a holiday visit to me, remarked that it was curious that the headaches from which for many years he had suffered more or less at business always left him when on a holiday. He had never derived any relief from the numerous remedies which had been prescribed for him by the many physicians whom he had seen in the course of years. This history, voluntarily given, made me suspect that his headaches might be of ocular origin, but on suggesting this he scouted the idea. He never had any pains in his eyes, and he assured me his vision had always been good. However, on taking him to the test-types, I found that his acuteness of vision was considerably below normal, and on examining him by retinoscopy, astigmatism was found in each eye with the meridians oblique. Cylindrical glasses were prescribed for constant wear, and he had no further trouble with the headaches from which he had suffered constantly for so many years.

A point of great importance is that headaches of ocular origin are frequently due to very slight errors of refraction, which are only discovered on very careful examination of the patient. High errors of refraction are but rarely associated with headaches, which are found chiefly associated with medium and especially with very slight refractive errors. Hence, I always urge that all suspected cases, even with a normal acuteness of vision as tested by the distance types, should be examined under homatropine with the shadow test, or by some of the objective methods. With such objective methods as the shadow test and the ophthalmometer, it is now possible to estimate refractive errors with the greatest precision and nicety.

It is sometimes astonishing to find the distressing headache and the great discomfort which may be due to such a slight refractive error as half a dioptré of astigmatism. I think the probable explanation is that, with a very high degree of refractive error, the patient's vision is so defective that he abandons all effort to improve it, and hence no strain is thrown upon the ciliary muscle. But with the slight errors, sufficient to produce slight indistinctness and blurring, such, for example, as is produced by a small amount of astigmatism, the patient is constantly endeavouring by irregular contraction of his ciliary muscle to counteract the astigmatism and get clear

images. The constant strain on his accommodation thus produces the distressing symptoms from which he suffers.

At the beginning of this year I saw a lady, æt. 33, who for years had suffered from severe frontal headaches, which had been much worse since an attack of influenza a year ago. These frontal headaches were always intensified by the use of the eyes. For some months before I saw her she had given up reading, as she found that the attempt to read for any length of time always brought on a severe attack of headache. She complained especially of the severe headache which always followed her shopping excursions, and said she was always afraid to look into a shop window for fear of bringing on her distressing headaches. On examination under homatropine I found that she had half a dioptré of hypermetropic astigmatism in the right eye, and the same amount of myopic astigmatism in the left. These cylinders were prescribed for constant wear, and since then she has been entirely free from headaches, and able to use her eyes without discomfort. This is only one of the numerous examples which I could quote from my case-books where a very slight amount of astigmatism frequently produces the most distressing symptoms, of which headache is one of the most common.

Whilst we know that headache is a very frequent accompaniment of errors of refraction, we must remember that it is a symptom only of a minority of such cases, although a very considerable minority. Bickerton,¹ of Liverpool, says that out of 1,000 cases of errors of refraction he found 277 suffering from headaches. This gives a percentage of 27·7. Ernest Clarke² finds that, of his patients who suffered from some error of refraction, about 30 per cent complained of headache. From my own private case-books I find that, taking my last 500 cases of errors of refraction, 123 of these suffered from headaches—that is, about 25 per cent. We may therefore take it as a fairly correct statement that, of patients suffering from refractive errors, from 25 to 30 per cent suffer also from headache.

Of all the forms of refractive error, the one which is most frequently the cause of headache is astigmatism. Of the 123 cases of refractive error in my practice associated with headache, 90 were cases of astigmatism, 28 were cases of hypermetropia, and 5 cases of myopia.

¹ *Lancet*, 1887, vol. ii, p. 303.

² Ernest Clarke, *Eye-Strain*, London, 1892.

This illustrates fairly well the relative importance of the various forms of refractive error in the production of headache, and it will be thus seen that astigmatism is by far the most common cause.

Of the different forms of astigmatism, the hypermetropic form is the one most frequently associated with headache. Of my 90 cases of astigmatism with headache, 40 were cases of hypermetropic, 31 were cases of myopic, and 19 were cases of mixed astigmatism.

I have already called attention to the fact that the presence of a very small amount of astigmatism, 0.5 to 1 D, is very frequently the source of all the patient's discomforts. Hence it is a matter of the very greatest importance to estimate this error with the greatest possible precision.

I would here call attention to the great utility of the ingenious instrument invented by Dr. Thos. Reid—the portable ophthalmometer, for the detection and measurement of corneal astigmatism. In the *Ophthalmic Review* of 1897 I have summarised in a short paper the special advantages of this beautiful instrument, which I have used for many years both in hospital work and in private practice. With this little instrument such a high degree of precision is attainable that a corneal astigmatism of 0.25 to 0.5 D can be readily estimated in a few seconds. It is a great help in a suspected case to be able to detect by this rapid and precise method the presence or absence of corneal astigmatism. When I detect the presence of corneal astigmatism with the ophthalmometer, then I proceed to examine the patient under homatropine, and estimate by the shadow test the total amount of astigmatism, which does not always coincide with the corneal measurement, there being also the lenticular astigmatism, which may increase or diminish the corneal. Where the patient objects to the use of homatropine, because of the prolonged interference with near vision, the shadow test can be employed by dilating the pupil with a few drops of a 5 per cent solution of euphthalmin, which interferes only very slightly, and for a very short time, with the patient's near vision. An account of this new mydriatic will be found in papers of mine in the *British Medical Journal*, 23rd September, 1899, and the *Ophthalmic Review*, November, 1899.

These errors of refraction cause an excessive strain to be thrown on to the ciliary muscle, which evidences itself by the consequent discomfort in the eye, or headache, or both. But another cause of headache is found in weakness or insufficiency

of the external muscles of the eye—muscular asthenopia, as it is called. The form most frequently met with is insufficiency of the internal recti. In order to read or do near work, the eyes require to be kept in a state of convergence by contraction of the internal recti muscles. If these muscles are healthy this convergence can be maintained continuously for a long time without discomfort to the patient, but should there be any weakness of those muscles, the prolonged strain produces great discomfort in the shape of headache, or pains in the eyes, or both.

Muscular asthenopia is a very much less frequent cause of headache than ciliary asthenopia; still, it should always be borne in mind, especially when the correction of any refractive error does not give relief to the patient.

Another cause of ocular headache which must be mentioned is glaucoma. Here the pain is primarily situated over the temporal and maxillary regions, but may spread forwards up to the middle line, or backwards and upwards to include the vertex. The pain is sometimes very severe, and is frequently accompanied by vomiting and considerable prostration. In acute glaucoma the pain in the eye itself is so acute that attention is at once directed to the eye as the cause of the headache, but in chronic glaucoma the headache may be such a prominent feature, and the discomfort in the eye so slight, that its dependence upon disease of the eye may remain unrecognised. This error of diagnosis will lead to disastrous results, as such glaucomatous attacks, without suitable treatment, soon lead to irretrievable loss of vision.

The treatment of the cases of headache dependent upon refractive error, and consequent over-strain of the ciliary muscle, consists in relieving this strain by prescribing suitable glasses for the patient.

This of itself is sufficient in the large majority of such cases to give the patient complete relief. There are cases, however, in which medical treatment is necessary, in addition to the relief of the eye-strain, in order to bring about the desired result. In such cases the eye-strain is a factor in the production of the headache, but not the sole factor. I have seen, for example, many cases of persistent headache in young anæmic women, which, though greatly relieved by the correction of the refractive error, did not disappear until the patient had been subjected to a thorough course of iron. I have seen also many cases of patients with refractive error after recovery from some acute disease suffering greatly from

headache. The correction of the refractive error did not give relief until the general health of the patient was improved. Cases also occur of periodic headache, in which refraction is an important factor, and complete relief will not be given to the patient until this is corrected. For example, it is a common thing to find women with refractive error suffering from headache during, or at the end of, the menstrual period, which disappears when the eye-strain is relieved by the proper glasses. In these cases, although the element of eye-strain is always present, it takes an additional factor to produce the headache, *i.e.*, lowering of the general health of the individual. I have seen many cases of young girls suffering from headache about the period of the establishment of the menstrual flow which were due to eye-strain, as the headache completely disappeared on correction of the error of refraction. Sometimes the refractive error was very slight, and yet the correction of it gave complete relief to the patient. After wearing the glasses for a year or two, when the menstrual flow had been regularly established, and their general health was good, many of these patients were able to discard the glasses prescribed, without suffering from any of the distressing symptoms of eye-strain which had previously afflicted them.

This is a clinical fact of considerable importance, which, I think, is not sufficiently appreciated, *viz.*, that the headache is frequently the result of several contributing factors, of which the refractive error is only one. The successful treatment of such cases, therefore, consists not only in the correct estimation of the refractive error and the prescription of suitable glasses, but in the discovery and removal of the other contributing causes.

A very common and very important factor is, as has already been pointed out, some lowering of the general health of the individual. The ciliary muscle, like all the muscles of the body, is influenced by the general condition of the individual. A man in robust health may be able to walk 20 miles, and without any undue fatigue, but the same individual, after an attack of some debilitating illness, may have great difficulty in covering a single mile. So is it with the little muscle of accommodation. A patient with some slight refractive error may have had no discomforts of any kind for many years of his life, because his ciliary muscle was quite able to do the extra work necessitated by the refractive error. He has some illness of a weakening character, or the tone of his general health is lowered, and the ciliary muscle is no longer able to

bear the strain which it previously did. Consequently, he begins to suffer more from the symptoms of eye-strain, of which headache is one of the most common. In the treatment of such cases, therefore, attention must be paid to the improvement of the general health of the patient, as well as the prescription of suitable glasses.

Another very important factor in the production of eye-strain is over-work and over-exertion of the ciliary muscle. A patient has got on quite comfortably for a long time, when some alteration in his mode of life takes place which necessitates an increased amount of near work for his eyes. The increased strain is more than the ciliary muscle can bear without manifesting symptoms of distress in the form of pain in the eyes and headache. In such cases it is to be remembered that the treatment does not end simply with the prescription of suitable glasses. Even with normal refraction the eye will stand only a certain amount of work. When this is overdone, symptoms of discomfort will arise. Such patients must be informed that the eye must not be subjected to too great a continuous strain. I have found it an admirable plan to recommend to the patients who have a large amount of near work to do the advisability of giving the eye occasionally short intervals of rest from near work by stopping their reading or writing or sewing for a few minutes every hour. These short intervals of rest are often of great assistance. It must be impressed upon such patients that glasses are only a help, but that if they wish to get entirely rid of their distressing symptoms, they must arrange their mode of life so that their eyes are not called upon to make the excessive continuous effort demanded by too long periods of near work.

When the headache is due to weakness or insufficiency of the external muscles of the eye, of which the most common form is insufficiency of the internal recti, relief is sometimes given by correcting any error of refraction, and thus enabling the patient to hold his work farther back. Sometimes patients have got into the bad habit of bringing their work quite unnecessarily close to their eyes, thus throwing great strain upon their internal recti. They must be taught the necessity of holding their work as far away from the eyes as they can with comfort. In such cases, too, much good may be done by regulated exercises and by improving the general health of the patient, by enjoining out-door exercise, and by the administration of tonics. In many cases, however, relief can only be given to the patient by prescribing prisms of suitable

strength with their bases in, in the case of convergence insufficiency, or in such a position as diminishes the work of the weakened muscle.

It is thus evident, from a study of the foregoing facts, what an important part the eye plays in the production of headaches. It is further evident that, whilst in many cases the relationship between the headaches and the eye is manifest, in others the eye-symptoms are so slight and trifling that the patient may suffer from headaches for many years without their ocular origin being suspected either by himself or his medical advisers. I would therefore insist that in every case of obstinate headache which does not yield to medical treatment, the eye ought to be examined as a matter of routine, even in the complete absence of subjective ocular symptoms. If this line of action be followed, it will frequently meet with its reward in the discovery of the true cause of the headache, and the ability, by suitable treatment, to give complete and permanent relief to the patient.



