OCULAR FINDINGS IN CASES WITH CHRONIC RHINOSINUSITIS
Mohammad M. Gab-Allah¹ and Nehal M. Samy El Gendy²
¹Ear, nose and throat Department, Hearing and speech institute
²Ophthalmology Department, Kasr Al Ainy medical school, Cairo University

ABSTRACT

Purpose: To elaborate causes of blurred vision and any other related ocular findings in cases with chronic rhinosinusitis. Material and Method: Cases with chronic rhinosinusitis complaining of blurred vision or ocular discomfort were referred to Ophthalmology clinic for assessment. Ocular examination included full ophthalmic examination, Hertleexophthalmometer assessment, field of vision and tear film evaluation. Results: one hundred and sixty cases were included: 45 % had frontoethmoidal sinusitis, 52.5% had pansinusitis and 2.5 % had isolated sphenoidalsinusitis. Unilateral cases contributed to 51.9% of our sample (83 cases). CT findings divided into: sinonasal polyposis 71.8% (115 cases), osteomeatal complex obstruction 22.5% (36 cases), frontoethmoidalmucocele 3.1% (5 cases), isolated fungal sphenoiditis 2.5% (4 cases), 1.26 % showed enlarged blind spot in field examination. Mean Schirmer test was 20+/ 5.1 mm. Comparing both eyes in unilateral cases ,the average Schirmer results was 19.7+/ 5.3 vs 24.1+/ 4.7 mm (p=0.007). Mean tear meniscus height on slit lamp was 599+/ 179.3µm. Both eyes comparison in unilateral cases was 493.1+/ 186µm. (P= 0.0001). Mean tear break up time(BUT) for all cases was 10.6+/ 1.3 sec . Both eyes comparison in unilateral cases was 10.1+/ 1.8 vs 11 3+/ 1.6 sec (p=0.004%). 5.6 % complained of diplopia in extreme gaze, 2.5% showed silent sinus syndrome, 1.87% showed mild proptosis. Conclusion: Dryness, extra ocular muscle dysfunction, silent sinus syndrome and mild proptosis can be other causes ( other than optic nerve affection) that causes ocular manifestations in cases with chronic sinusitis.

INTRODUCTION

Chronic rhinosinusitis (CRS) is referred to as chronic inflammation of sinuses that persists for more than 12 weeks despite treatment. (1) Diagnosis of CRS depends on symptomatology and/or endoscopic and radiological classification. Symptomatology is usually divided into: major factors like facial congestion and nasal purulence, and minor factors like headache, cough and ear fullness. Systems either subjective like SNOT-22 or objective like Lund-Mackay staging system are used to detect the severity of disease (2). Although stated by many cases of CRS; Ocular complains are usually overlooked, except for isolated sphenoid sinusitis fearing from optic neuritis. With the exclusion of optic neuritis; physicians stand clueless about the reason of disturbed vision in other CRS cases. Subtle decrease or increase in tear film thickness can affect vision quality and quantity. Changes in tear film composition can also affect vision quality. Change in eye position may also contribute to such changes. We conducted this study to elaborate various ophthalmic findings that may explain vision disturbance in cases with CRS.

MATERIAL AND METHODS

This study was conducted in accordance with the Declaration of Helsinki. Protocol was approved by local ethical committee. Cases with CRS and ocular discomfort represented to a tertiary referral clinic at Hearing and speech institute were referred to ophthalmic examination at KasrAlainy ophthalmology clinic.

Inclusion criteria: Cases with unilateral or bilateral CRS with symptoms persisting for at least 3 months. Adults aging between 30 and 50 years old.

Exclusion Criteria: Cases with known ocular diseases causing diminution of vision, Established cases of dry eye (BUT <5 sec or Schirmer’s test of <5 mm), history of eye surgeries or contact lens use, eyelid disorders including blepharitis, conjunctival diseases (e.g. symblepharon andpterygium) .Cases with dacrocystitis (acute or chronic), lacrimal punctastenosis and with history of systemic illness like diabetes mellitus, hypertension, collagen vascular disorders or any use of systemic medications were also excluded. Cases with previous sinus surgery were excluded. Cases with abuse of ephedrine or pseudoephedrine containing medications were also excluded.

Base line examination included: ENT complete evaluation: this included full ENT outpatient examination with endoscopic examination of the nasal cavity. Routine CT examination of the paranasal sinuses was ordered to all cases.

Eye complete examination: This included BCVA, Schirmer test, tear film evaluation (Tear break up time [BUT] test, reurgence test, John tests) , complete
ophthalmological examination including slit lamp examination, extraocular muscle evaluation (EOM) and fundus examination. Field of vision using 30.2 pattern (Humphrey Field Analyzer; Humphrey Instruments, Dub-lin, CA, USA). Subjects with unreliable visual field tests (fixation loss > 20%, false negative or false positive responses> 33%) were excluded. The visual field data were obtained from print-out the machine provides HertleExophthalmometer assessment of eye balls.

Statistics: Statistical data were described in frequency and percentages for categorical data, and mean ± SD for numerical data using SPSS version 24 (SPSS Inc., Chicago, IL, USA).

RESULTS

- Our study included 160 cases with unilateral and bilateral chronic sinusitis, 39.4% were females,. The patients' age ranged from 34 to 49 years with mean age value 42± 5.2 years.
- Cases with pansinusitis represented 52.5% of our sample, where as 45% of patients had frontoethmoidal sinusitis, and 2.5% had isolated sphenoidal sinusitis.
- Unilateral cases contributed to 51.9% of our sample (83 cases).
- CT findings divided into: sinonasal polyposis 71.8% (115 cases), osteomeatal complex obstruction 22.5% (36 cases), frontoethmoidal mucocele 3.1% (5 cases), isolated fungal sphenoiditis 2.5% (4 cases).
- Ophthalmological assessment data included in our statistics included 237 eyes of the 160 patients. In the same time data harvested from unilateral cases, were compared to the other normal side of the same patient.
- BCVA ranged from 6/6 to 6/12. Whereas 10.8% (9 cases) of the unilateral cases had a difference of one or two lines between the two eyes.
- Tear film evaluation results:
  - Schirmer test: mean Schirmer test was 20+/− 5.1 mm. We compared eyes in unilateral cases with the other side. The average Schirmer results for the unilateral eye was 19.7+/− 5.3 mm compared to 24.1+/− 4.7 mm .The difference was statistically significant (p=0.007)
  - Tear Meniscus height on slit lamp: had a mean of 599+/− 179.3 micrometer. Comparing both eyes of unilateral cases, affected side showed mean height of 493.1+/− 155 compared to 598+/− 186 microns on the other side . The difference was statistically significant. P= 0.0001
  - Tear break up time: mean BUT time for all cases was 10.6+/− 1.3 sec . Unilateral cases had a mean of 10.1+/− 1.8 sec, compared to the other side eye ,mean BUT was 11 3+/− 1.6 sec . The difference was statistically significant p=0.004
  - Regurge test: This was negative in all cases.
    - Fundus examination: Nothing specific to chronic sinusitis was revealed in all cases.
    - Field of vision results: Three eyes out of the 237 eyes(1.26%) showed enlargement blind spot, despite a 6/6 vision. (fig 1)
    - EOM evaluation: Nine cases complained of diplopia in extreme lateral gaze(5.6%). Mild superior oblique underaction was recorded in these cases.
    - HertleExophthalmometer assessment: Four cases of unilateral cases(4.8% of unilateral case, 2.5% from total cases) showed mild enophthalmos with a difference of more than 2 mm between the two eyes .Three cases from the unilateral group(1.87% of the total) showed mild proptosis(difference of 3 mm), these case showed superior oblique underaction in EOM assessment.

DISCUSSION

It is common to encounter patients with visual disturbance in cases with chronic sinusitis. This could be explained by optic nerve affection in cases with sphenoidal sinusitis or spread of infection. Still some patients are not comfortable with their vision, despite normal optic nerve function. It has been reported that acute sinusitis can trigger trigeminal neuralgia and affection, in a case report study (3). If this is true then chronic sinusitis may affect the trigeminal nerve in another way resulting into tear film disturbance. In a study by Galor et al (4), dry eye was addressed as a pain disorder. They summarized the evidence that chronicity of dry eye is more likely to occur in patients with dysfunction in their ocular sensory apparatus (ie, chronic ocular pain). Another hypothesis is that the pathology affecting nasal mucosa (allergy, infection) can logically affect conjunctival mucosa which is similar histologically. On the other hand it has been suggested that chronic corneal pain, resulting
from dry eye, may contribute to increased severity of other components of oculofacial pain. The neuropathic processes underlying chronic ocular pain may lead to increased afferent inputs to the trigeminal system, including neurons in the trigeminal ganglion, second-order neurons in the trigeminal brainstem, and third-order neurons in the thalamus (5). This could exaggerate the pain symptoms generated from chronic sinusitis. Our study showed that dryness and chronic sinusitis may co-exist. This was further elaborated by comparing both eyes in unilateral cases. Tear film disturbance result into blurred vision. Dryness symptoms are variable depending on day time, exposure to heat or wind. This this blurring is usually variable too. Dry eye causes fall into two main categories, aqueous deficiency and evaporative (6). Differentiating between the two causes was beyond the scope of our study, however, in our study, both BUT and Schirmer tests were affected. Change in eye position can also result into subtle vision affection that is difficult to be explained by the patient. Sinus silent syndrome (7) has been reported by Soparker et al back in 1994. They described the condition as a benign one. In our study we report 2.5% affection with this syndrome. However, this could be an under estimation, as bilateral cases showed have compared with their pre-disease measurements, but this isn’t available. Our study also showed that three cases with superior oblique muscle affection, showed mild proptoses. This could be explained by associated oedema in orbital tissue, however this was missed in CT scan reports. Six other cases had diplopia in extreme lateral gaze without proptosis, due to superior oblique underaction. This could be explained by associated trochleitis. Routine CT scan cuts, missed EOM evaluation. Three eyes had isolated enlarged blind spot in their fields. Whether this was due to previous neuritic attack or some sort of nerve compression is not clear. Acute neuritis could be excluded by the fact that vision was good 6/6 in those cases.

In conclusion, dry eye is an important cause of disturbed vision in cases with chronic sinusitis that is usually overlooked. CT scan reports, in cases with chronic sinusitis, are recommended to include more detailed study of the orbit. Optic nerve affection isn’t the only cause of visual disturbance to be excluded in such cases.