THE CORRELATION BETWEEN SIGNS AND SYMPTOMS IN THE DRY PATIENT

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A very common complaint among an elderly population of patients is that of a dry feeling eye. Patients use many descriptive terms in an effort to explain the feeling of their eyes. These adjectives have previously been lumped together into one group to describe the various forms of the dry eye. The basic premise of this study was to determine if there was any diagnostic significance to the different descriptive terms used by patients to describe the feeling of their eyes. That is to say, are there specific descriptive terms used to describe specific causes of the dry eye condition.

Realizing that the final diagnosis of the dry eye condition would be made during the clinical examination using the slit lamp, tendencies shown in this study could possibly be of extra use in dealing with the patient with nebulous dry eye signs. When clinical examination reveals questionable or negative results, the tendencies revealed in this study could be of some diagnostic use. These also could be of use in deciding whether or not a patient truly has a tear film abnormality of deficiency.

Doing this study also afforded the opportunity to check the efficiency of certain diagnostic signs in leading the clinician to his conclusion about the dry eye condition. There are several tests which are the clinician's ammunition in diagnosing a dry eye. The signs offerred by these tests are the basis of the final decision about the dry eye. The frequency of appearance of these signs in dry eyes was also examined in this study.

Dr. Charles McMonnius previously had done a study revealing which symptoms were clinically significant in the dry eye patient. He used a twelve question questionnaire on patients with known dry eye conditions. His study showed statistically which case history symptoms were significant. Question 2 of his questionnaire asked the patients if they experienced any of five possible dry eye symptoms. The three that were found to be of statistical significance were dryness, foreign body sensation, and burning.

While working at the Veteran's Administration Hospital in Saginaw, Michigan, I found many patients with dry eye like complaints. In selecting this population, I basically limited the study to middle-aged to elderly men. This is significant because Dr. McMonnius also found an increase in symptomology with increasing age.

Patients presenting to the V.A. clinic with any kind of dry eye complaints were presented with question 2 of the questionnaire.(Figure 1) Affirmative answers to the five possible dry

FIGURE 1

DO YOU EXPERIENCE ANY OF THESE SYMPTOMS?
1. DRYNESS _____
2. FOREIGN BODY SENSATION _____
3. BURNING _____
4. ITCHING _____
5. SORENESS _____

eye complaints were recorded in a table followed by the results of our examination. Four areas were examined using the slit lamp. First was an external and corneal exam looking for the presence

of pathology. Second, the integrity of the tear film was checked looking for debris. Thirdly, flourescein was instilled in the eyes and judged as normal or shorter than normal. Lastly, the cornea was examined for the presence of flourescein staining.

The answers to the questions about symptomology and the results of our clinical exam were then compared and contrasted looking for correlations between the two. Different groups of causes for the dry eye condition were found and analyzed for what symptoms were prevalent. Also, the results of the clinical findings were analyzed to see if positive results were more prevalent for certain causes of the dry eye.

The pre-corneal tear film is composed of three layers. The outermost layer is the lipid layer which is responsible for preventing the evaporation of the tears when the eye is open. This layer of the tears is affected in meibomianitis and blepharitis and thus can be a factor in leading to dry eye symptomology.

The major portion of the tear film is the aqueous layer. This layer is responsible for the nutrition and immunity of the cornea as well as providing the corneal smoothing necessary for a quality optical surface. Keratoconjunctivitis Sicca causes a deficiency of the aqueous layer and therefore can also be responsible for dry eye symptoms. It is thought that most dry eyes are due to a deficiency of the aqueous layer.

The innermost layer of the tear film is the mucin layer. Mucin adheres to foreign bodies and debris that gets into the eye and thus helps the lids in the removal of foreign material into the inferior fornix. The mucin layer also makes the cornea into a hydrophilic surface. The main indicator of mucin deficiency of the tears is a short tear film break-up time. Deficiency of the mucin layer is prevalent in chemical burns and Stevens-Johnson syndrome.

Dry eyes can be due to deficiencies in any or all of the tear film's three layers. There also can be a dry eye condition without there being any deficiency in the tears themselves. Lid anomalies such as entropion and ectropion often lead to symptoms the tear film is not properly spread over the entire cornea. Also, incomplete lid closure or incomplete blinking can cause dry eye complaints because part of the cornea is exposed to

the air at all times.

Important factors to consider in any dry eye patient are the presence of systemic disease states as well as systemic drug therapy. Such systemic pathologies as rheumatoid arthritis and sarcoid are notorious for causing dry eye conditions. Hyperthyroidism, because of the resulting exopthalmos, often potentiates a dry eye state due to exposure. An exopthalmic eye will not be adequately covered by the lids which in turn will not adequately spread tears over the entire cornea. Systemic drug therapy has the effect of altering the tear film chemistry as does any foreign substance which enters the blood. Certain classes of medications are notorious for causing dry eye complaints. Antihistamines, commonly used by people who have colds, have been associated with dry eyes in many patients. Anti-cholinergics and and anti-depressants also fall into the category of drugs that make some dry eyes happen.

Having discussed what may lead to a dry eye state, what are the symptoms I am speaking about. Patients with dry eyes will have a fairly wide array of complaints. Many will say simply that their eyes feel dry. Many more will have problems with burning or itching eyes. Some will even describe the feeling of their eyes as that they feel like there is something in their eyes all the time. In certain types of dry eye conditions, a symptom may be excessive tearing or watering eyes. Patients can sometimes tell you that their eyes are not dry at the time they visit your office, but are dry under certain circumstances. They commonly report that their eyes feel dry when they are in

the car or when they are outside on windy days. Reports of dryness occurring at only one time of year, especially winter, are not rarities. These types of symptoms should not be ignored despite the fact that there may be no signs of a dry eye in your exam.

There are two in-office tests available to the clinician to test the quantity and quality of the tears. The Schirmer tear test of basic secretion (Schirmer I) is a measure of total tear secretion. Standardized strips are placed over the edge of the lateral part of the lower lid. The patient is to keep his eyes open for the test duration of five minutes. The secretion of the tears causes wetting of the strip with a total wetting of less than five millimeters in the five minutes considered to be abnormally low.

The second in-office test used is tear film break-up time. Flourescein is instilled into the eye and the patient is instructed not to blink until he is told. Using the slit lamp the cornea is observed looking for dry spots or streaks. The time between the patient's last blink before he was told not to and the first appearance of a dry spot or streak is the B.U.T. A break-up time of less than ten seconds is considered abnormally low.

The main diagnostic tool available to the clinician in diagnosing a dry eye is the slit lamp examination. Several clinical signs are often associated with the dry eye symptoms mentioned by the patient. A qualitative observation of the tears can show a large increase in the amount of debris in the tears including threads of mucin. Quantitatively, a decrease in volume of the marginal tear strip often can be noted. With the instillation of flourescein, punctate staining of the lower two-thirds of the

cornea is often manifested. Late in the devel pment of a dry eye, a filamentary keratitis is a sign of a severely dry eye. Sometimes, the main clinical manifestation is a chronic red eye. Bulbar conjunctival injection can be as clinically significant as any corneal sign.

The mainstay of dry eye therapy is the use of artificial tears. These are used as little a q.i.d. in mild cases to on an as needed basis in severe cases. It is not possible to over-use or abuse this therapy. Clinicians should not hesitate to give artificial tears to patients with complaints even if there are no clinical manifestations. In cases of exposure, an ointment known as Lacrilube is an excellent option. This is especially an advantage for when a patient is asleep and can not be awoken every so often to instill artificial tears. Other options such as Lacreserts and punctal occlusion are also available but have not proven to be as effective and are reserved for the more severe cases.

Analysis of the data collected on the five symptoms about which each patient was questionned (Figure 2) showed that the most common symptom reported was that of itching. However,

FIGURE 2

PERCENTAGE OF DRY PATIENTS WITH EACH SYMPTOM	
1. ITCHING	64%
2. DRYNESS	41%
3. BURNING	36%
4. F.B. SENSATION	14%
5. SORENESS	0%

itching was found to be a statistically insignificant complaint in Dr. McMonnius' study because it was found that it was as commonly a complaint in normals. This is not to say that a patient who complains of itchy eyes should be ignored, but that many normals will have the same complaint.

The second most prevalent symptom reported was that of simple dryness of the eyes. This along with the next most prevalent sign, burning, were found to be significant symptoms by Dr. McMonnius. These two complaints were the main tip-offs in the V.A. setting that a patient truly had a dry eye problem.

Foreign body sensation which was found to be a significant symptom by Dr. McMonnius, proved to be an infrequent complaint. The last symptom that was asked to each patient, soreness, did not turn up at all within the V.A. population.

Based on the slit lamp examination, all the dry eye conditions were divided into five categories. Four of the categories were

composed of patients who had an observable pathological state that was causing or at least contributing to the dry eye state. The last and largest category, was composed of those patients who demonstrated no external pathology, but none the less had significant dry eye complaints.

The first group of patients with dry eye complaints were those patients with blepharitis.(Figure 3) These patients presented

FIGURE 3

DRY EYE WITH BLEPHARITIS N - 5	
SYMPTOM	# OF COMPLAINTS
ITCHING	4
BURNING	3
F. B. S.	1

with only three different symptoms. The most commonly reported symptom was that of itching with four of the five patients having this complaint. Three of the five patients also had complaints of burning eyes. There was one patient who gave the symptom of foreign body sensation. None of the five patients reported dryness as a symptom. These results correlate reasonably well with the overall percentages of dry eye symptoms with itching being the most common symptom and foreign body sensation the least common. Therefore, in this case no specificity of a symptom for blepharitis can be established. The only outstanding feature of this category was the lack of the dryness complaint.

The second category of patients were those with meibomianitis, a condition known to effect the lipid layer of the tear film. Four patients with meibomianitis presented to the clinic with

three different symptoms (Figure 4). Again, the leading symptom

FIGURE 4

DRY EYE WITH MEIBOMIANITIS N - 4	
SYMPTOM	# OF COMPLAINTS
ITCHING	4
DRYNESS	2
F. B. S.	1

was itching with all four patients reporting this. The second most common symptom in this case was dryness with half the patients with this complaint. As with blepharitis, there was only one report of foreign body sensation. These findings again correlate reasonably well with the overall percentages of dry eye complaints. However, there was the glaring absence of any burning complaints in this category. No specificity for the three symptoms reported can be established for meibomianitis patients. Again, the outstanding feature of this group, was the lack of one complaint, burning.

A third category of patients were those with corneal dystrophies. There were three patients diagnosed as having a corneal dystrophy. Interestingly, the only symptom reported by all three of these patients was dryness of the eyes. (Figure 5)

FIGURE 5

DRY EYE WITH CORNEAL DYSTROPHY N - 3	
SYMPTOM	# OF COMPLAINTS
DRYNESS	3

In this case, despite the low number of patients, it is reasonable to ascertain that the main complaint patients with dystrophies will have is dryness. Dryness was reported in other categories

but not to the exclusion of other symptoms. Therefore, it can be concluded that patients with corneal dystrophies are likely to have the symptom of dryness.

Five patients at the V.A. clinic were diagnosed as having exposure keratitis that led to their dry complaints. These patients described their condition using four symptoms, the most common of which was again itching. Four of the five had complaints of itching followed by two patients with complaints of burning (Figure 6). One patient had the symptom of dryness

FIGURE 6

DRY EYE WITH EXPOSURE KERATITIS N - 5	
SYMPTOM	# OF COMPLAINTS
ITCHING	4
BURNING	2
DRYNESS	1
F. B. S.	1

and one also had foreign body sensation. The itching complaint once again correlates reasonably well with the percentage of overall dry eye complaints and thus can not be considered specific. Because of the low fequency of the other symptoms, they are also eliminated as being specific. This proved to be the most nebulous of all of the categories.

The last and most prevalent group of patients were those who presented with dry eye symptoms but upon slit lamp examination revealed no external signs. The eight patients presented with all four of the symptoms. Five of the eight patients reported itching. However, in this category, five also presented with

with complaints of burning and dryness (Figure 7). Foreign body

FIGURE 7

DRY EYE WITH NEG. SLIT LAMP EXAM N - 8	
SYMPTOM	#OF COMPLAINTS
ITCHING	5
BURNING	5
DRYNESS	5
F. B. S.	1

sensation was noticed only by one of the eight patients in this group. This category revealed no specificity for any of the symptoms and in fact produced the most confusing statistics. The only symptom which matched the pattern was foreign body sensation. The group of symptoms in this category provided no clues toward etiology.

Beyond the external and corneal examination which detected states of pathology, three signs were commonly seen which led to the conclusion that the patient truly had a dry eye . on every patient who had dry eye complaints, fluorescein was instilled into each eye to look for staining. Seven of the 28 patients examined did display some degree of flourescein staining. Two of those patients with meibomianitis displayed a diffuse inferior pumctate staining. The category in which flourescein staining was most prevalent was exposure keratitis. All five patients with this condition did have significant corneal staining. In fact, this was the easiest method for diagnosing this condition. However, this is the only category which this technique proved diagnostic.

The overall quality of the tear film was also examined on each patient. Excessive tear film debris and mucin threads could be observed on eight of the patients with dry eye symptoms. The category where this proved to be most diagnostic was those patients who showed no other slit lamp findings. Tear film debris was noted on fifty percent of these patients. The presence of this debris can be a tip-off in patients with nebulous dry eye complaints.

On all the patients with dry eye symptoms, a tear film break up time was taken. This was easily the most diagnostic of all the examination techniques. Eighty eight percent of the patients showed break up times abnormally low, less than ten seconds. It can be concluded that this is a procedure that should be done on any patient that has dry eye complaints. It is very simple to do and in my case provided the most valid answers to whether or not the patients had legitimate complaints.

This study revealed that there really is no specificity to the various dry eye complaints. Itching is the most common symptom reported and proved to be the least specific of all. This corresponds to the findings of Dr. McMonnius who in his study determined that itching was a statistically insignificant complaint in deciding whether a patient had a dry eye or not. For each category, the percentage of each symptom noted correlated with the overall percentages of each symptom for all of the dry eyes examined. The one exception were the patients with corneal dystrophies who reported dryness to the exclusion of other symptoms.

Also, this study showed that the single most valid diagnostic test for a dry eye is the tear film break up time. An abnormally

low break up time was manifested in the great majority of patients with dry eye symptoms. It is a very simple test to perform and in my case provided the best information of the validity of patients complaints.

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