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# ASSESSMENT OF CORRELATION OF DISEASES OF DRY EYE AND VITILIGO

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**Abstract:**

***Objective:*** *The purpose of this research work is to assess the relationship of the diseases of vitiligo and dry eye with objective features.*

***Methodology:*** *This research work carried out on 20 patients of vitiligo and 21 patients suffering from not complicated refractory issues. All these patients had to undergo complete examination through ophthalmology including Fluorescein Breakup Time, Corneal Fluorescein Staining and Schirmer Test-1. The evaluation of the status of the dry eye carried out by the average of the Ocular Surface Disease Index.*

***Results:*** *Both of the groups were same about the age of the patients and the distribution of gender. The group of the vitiligo was present with the high scores of Ocular Surface Disease Index (24.8 ± 13.88 Vs 12.68 ± 3.38), short FBU (5.78 ± 2.88 Vs 7.78 ± 2.18 and very high Corneal Fluorescein Staining positivity 16.0/28.0 versus 3.0/29.0 as compared to the group of healthy controls. The patients of both groups were same regarding the Meibomian Gland Dysfunction and results of the Schirmer test. Total 44.68% patients of vitiligo were present with the peri-ocular involvement. The examination in the patients of vitiligo discovered that there were short Fluorescein Breakup Time and Schirmer test in the patients present with the peri-ocular involvement; there were same scores of Ocular Surface Disease Index and the status of the Meibomian Gland Dysfunction.*

***Conclusion:*** *This research work proposes a possible relationship of the diseases dry eye and vitiligo. The diagnostic tools for the disease of dry eye are in better association with one another. The questionnaire of Ocular Surface Disease Index seems empirical for both diagnostic reasons as well as follow-ups.*

***KEY WORDS:*** *Meibomian Gland Dysfunction, Ocular Surface Disease Index, Fluorescein Breakup Time, Schirmer, Corneal, Vitiligo, Dysfunction.*

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## INTRODUCTION:

One of the most frequent topics of ophthalmologic routine practice is Dry Eye Disease. This complication is an isolated condition but it can be the part of some other abnormality. This complication develops as an outcome of the altered metabolism of tear due to the dysfunction of the lacrimal functional department. Vitiligo is a complication categorized with the presentation of the achromic patches on the surface of skin as well mucous membranes. The correlation of the vitiligo with various other ocular diseases has been elaborated like uveitis & glaucoma. The relationship of the vitiligo with the dry eye disease is not present in detail in various research works.

Only a single research work interrogated this correlation and stated changes in the tear functions and ocular surface. The main purpose of this research work was to examine the presence of dry eye disease in the patients suffering from vitiligo with objective features and Ocular Surface Disease Index questionnaire and then provided the comparison of this group with the group of healthy controls.

## METHODOLOGY:

The current research work carried out from March 2019 to August 2019. We took the verbal consent from all the participants of this research work. There were 20 patients of vitiligo in the study group and there were 21 patients in the group of controls. All these patients visited the Department of Ophthalmology of Alshifa Eye Hospital Sukkur, with no complicated refractory issues. The patients who were under the active treatment of the vitiligo, with any ocular complication or the patients under some medication were not the part of this research work. Every participant of this research work has to undergo complete ophthalmologic assessment including the Fluorescein break up time, Corneal Fluorescein Staining and Schirmer Test-1 with the utilization of the topical anesthesia.

We used the Ocular Surface Disease Index scores for the evaluation of the status of dry eye. We carried out the grading of the Corneal Fluorescein Staining in accordance with the Oxford scheme and the classification of the extremity of the vitiligo Meibomian Gland Dysfunction carried out in accordance with the Bron system. One of the authors performed all these procedures. Though, with empirical purposes, the analysis of these 2 features carried out as dichotomous variables (available or not available) due to the small sample size of the study. We recorded all the information on a well organized Performa. SPSS V.20 was in use for the statistical analysis of the collected information.

## RESULTS:

Study (Group-V) & control (Group-C) groups were same regarding their age (41.28 ± 10.8 versus 37.58 ± 9.78 years) and distribution of gender. The scores of Ocular Surface Disease Index were very high, there were shorter Fluorescein break up time and Corneal Fluorescein Staining was much high in the patients of vitiligo where both groups were same regarding the status of Meibomian Gland Dysfunction and results of Schirmer test (Table-1).

**Table-I: Comparison of Results of Two Groups (41 Patients).**

| Results | Vitiligo (n= 20) | | Control (n=21) | | P value | |
|---|---|---|---|---|---|---|
| | Right eye | Left eye | Right eye | Left eye | Right eye | Left eye |
| FBU (seconds) | 5.78 ± 2.88 | 6.16 ± 2.88 | 7.78 ± 2.18 | 8.0 ± 2.18 | 0.0050[a] | 0.0030[a] |
| Schirmer test (mm) | 7.78 ± 2.58 | 6.0 ± 2.88 | 9.38 ± 3.18 | 9.58 ± 3.8 | 0.0550[a] | 0.0890[a] |
| Ocular Surface Disease Index score | 24.8 ± 13.88 | | 12.68 ± 3.38 | | <0.0010 | c |
| Corneal fluorescein | 10/8/4/2 | 13/6/4/1 | 26/3/0/0 | 26/5/0/0 | <0.0010[b] | <0.0050[b] |
| Meibomian Gland Dysfunction * | 3/14/4/3/0 | 4/13/4/3/0 | 4/20/3/0/0 | 7/20/3/1/0 | 0.7850[b] | 0.8060[b] |

The involvement of the peri-ocular was available in 44.68% patients of vitiligo. When we assessed the patients of vitiligo regarding the condition of the peri-ocular involvement, we identified that the patients with the peri-ocular participants, though statistically not significant, were younger than the participants with no peri-ocular involvement (37.58 ± 10.88 years versus 44.48 ± 8.68 years). In the patients of vitiligo, there was shorter Fluorescein Breakup Time than ten seconds in 68.0% (only right eye) and 68.0% (only left eye) when compared with the patients of healthy controls (46.38% for only right eye, Chi-square test, p=0.0860 & 36.68% for only left eye, Chi-square test, p= 0.0140).

Analysis of the parameters of research work within the patients of vitiligo showed that Fluorescein Breakup Time and Schirmer test-1 were shorter in the patients present with the involvement of the peri-ocular, the scores of Ocular Surface Disease Index and status of Meibomian Gland Dysfunction status, the availability of the Corneal Fluorescein Staining was more important although being not much significant (Table-2).

**Table-II: Comparison Of Results Within Vitiligo Patients Regarding The Periocular (VPO+/-) Involvement**

| Results | Group VPO(+) (n= 8) | | Group VPO(-) (n=12) | | P value | |
|---|---|---|---|---|---|---|
| | Right eye | Left eye | Right eye | Left eye | Right eye | Left eye |
| FBU (seconds) Mean ± SD | 4.58 ± 2.68 | 5.8 ± 2.38 | 6.88 ± 2.58 | 7.18 ± 2.88 | 0.0340[a] | 0.0520[a] |
| Schirmer test (mm) Mean ± SD | 6.38 ± 2.78 | 6.88 ± 3.8 | 8.88 ± 1.78 | 9.00 ± 2.28 | 0.0070[a] | 0.0430[a] |
| Ocular Surface Disease Index score Mean ± SD | 27.3±14.5 | | 19.1±11.2 | | 0.31 | c |
| Corneal Fluorescein Staining * status (absent/present) | 3/9 | 2/8 | 7/5 | 9/3 | 0.0720[b] | 0.0660[b] |
| Meibomian Gland Dysfunction * (absent/present) | 2/10 | 3/9 | 3/11 | 3/11 | 1.000[b] | 1.000[b] |

In this research work, we identified that the scores of Ocular Surface Disease Index, Schirmer test-1, Corneal Fluorescein Staining and FBU were all available with one another significantly (Table-3).

**Table-III: The Correlations Between Ocular Surface Disease Index Scores and Other Objective Tests**

| Ocular Surface Disease Index Scores | Correlation Coefficient (Spearman's Rho) | Significance (P Value) |
|---|---|---|
| FBU right eye | -0.4878 | <0.0010 |
| FBU left eye | -0.4828 | <0.0010 |
| Corneal Fluorescein Staining right eye | 0.6118 | <0.0010 |
| Corneal Fluorescein Staining left eye | 0.6088 | <0.0010 |
| Schirmer right eye | -0.3288 | 0.0058 |
| Schirmer left eye | -0.4318 | 0.0018 |

## DISCUSSION:

Vitiligo is one of the serious complications of skin and this disease has an incidence up to 2.0% in general public. We found no particular research work on the rate of occurrence of vitiligo. But various national research works depending upon the data of the registers of the hospitals stated the occurrence rate of 1.38% in children and 2.8% in adult cases. Regular treatment and follow up is the need of this disease. The rate of prevalence of Dry Eye Disease is up to 13.0%. There is lack of the data about the rate of occurrence of Dry Eye Disease nationally. A research work on the patients suffering from Sjögren's Syndrome showed that 33.18% patients stated persistent complaints of dry eye for greater than 3.0 months and 7.38% patients stated the regular use the substitute eye drops for tear. Ophthalmologic outcomes have been researched elaborately and the most studied subject if the uveitis due to its auto-immune pathophysiology of inflammation. There is no research work which has elaborated the correlation between the Dry Eye Disease and the vitiligo disease.

The findings of this research work with no manifested complaints of dry eye, objective as well as subjective tests displayed that the patients of vitiligo were present with the significant disparity from the group of controls which should draw the concentration of the practitioners as well as patients. The confirmation of Dry Eye Disease carried out with the parameters like Corneal Fluorescein Staining, Fluorescein Breakup Time and Schirmer tests. There are variable sensitivities & specificities of these tests methods. These diagnostic tools also have many cut-off points. Since, the outcomes of the diagnostic tests of Dry Eye Disease show a wide range of variability among various conditions, relying

on only one cut-off point is not dependable. In one recent research work, Alves stated that there was best correlation among vital staining and Fluorescein Breakup Time with each other while the best combination of the tests to identify the Dry Eye Disease was Ocular Surface Disease Index, Fluorescein Breakup Time and Schirmer.

The findings of this research work presented that this association was very good. Facial involvement may be available up to 85.0% of generalized patients of vitiligo with different levels of severity. There was involvement of peri-ocular in 58.0% patients. In our group of the patients of vitiligo which all were present with generalized form, 45.0% patients were present with the peri-ocular involvement. At perilesional zones of regions of vitiligo, there is available apoptosis of the melonocytes and accretion of T-lymphocytes. The categorization of the Dry Eye Disease consists 2 types, one is deficiency of tear and the other is evaporative. The main reason of the second type Dry Eye Disease is the Meibomian Gland Dysfunction. In this research work, groups were same about the status of the Meibomian Gland Dysfunction. So, the non-availability of the effect of Meibomian Gland Dysfunction in our study group supports the dysfunction of the lacrimal unit as a contributory factor which results in the metabolism of tear. There are many probable etiological features causing this very abnormality like age, factors of environment, hormonal, other auto-immune diseases, under medicaltion, wear of the contact lens and surgical intervention: all can lead to a response of inflammation.

One of the most vital finding of this research work is use of the Ocular Surface Disease Index tool for Dry Eye Disease in a different group of patients. Our research work is the first study to utilize the Ocular Surface Disease Index in the patients of vitiligo. This current research work showed that there is a strong correlation of Ocular Surface Disease Index with the other diagnostic methods.

## CONCLUSION:

The results of this research work suggest the relationship between the diseases of vitiligo and dry eye. The investigative tools for the disease of dry eye are in good association with one another. The questionnaire of the Ocular Surface Disease Index scores seems empirical for both the investigative and the follow up purposes.

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