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STUDY ON THE CORRELATION OF PREVALENCE OF OCULAR DISEASE TO PSORIASIS AND OTHER CONCOMITANT DISEASES IN PATIENTS WITH PSORIASIS IN SAUDI ARABIA
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ABSTRACT

***Objective*: Ocular diseases are chronic type associated with multiple factors. This research investigates correlation of prevalence of ocular disease to different demographic variables, medical history and psoriasis as well as other concomitant diseases in patients with psoriasis.**

***Design*: A survey-based study was conducted.**

Setting: The research was conducted among patients with ocular diseases in a hospital of Saudi Arabia.

***Participants*: The study was approached to be conducted among 120 patients with psoriasis and age≥ 18 years. 101 patients admitted to participate.**

***Intervention*: Questionnaire was prepared to get information from patients. Observations of Ophthalmologists and dermatologists were recorded. Statistical package for social sciences (SPSS version 22) was used for data entry and analysis. Odd ratios and Chi-square test were used to analyze the correlations.**

***Results*: Our study has found significant correlation of prevalence of diabetes mellitus and ocular complication and significant correlation of prevalence of diabetes mellitus and cataract. We also observed significant correlation between the prevalence of hypoparathyroidism and ocular complication and significant correlation between the prevalence of having hypoparathyroidism and cataract. Having dyslipidemia and ocular complication was found to be significantly correlated. Our study found association between presence of cataract and topical steroid use. Our findings have focused on the treatment modalities commonly used in Saudi Arabia.**

***Conclusion*: Our research findings indicate that proper management of the correlated diseases can prevent the occurrence and severity of ocular diseases.**

INTRODUCTION

Ocular diseases are common in throughout the world. In Saudi Arabia, the common people of these countries still lack in adequate awareness of diseases, their correlation and susceptibility. On the contrary, researches on correlation of prevalence of ocular disease to medical history and concomitant diseases have not been done so much. A recent study in Yemen indicated the prevalence of diabetic retinopathy (DR) in 55% and proliferative retinopathy in 17% of 350 participants. In Egypt, the prevalence of DR among diabetic patients is above 20.5 percent in patients of over 18 years. There has still not been significance research on correlation of prevalence of ocular disease to different demographic variables, medical history and concomitant diseases in Egypt, Sudan, Yemen and other countries. There are different types of parameters relevant to the prevalence of ocular diseases. In this study, we have analyzed whether there is any correlation of ocular diseases to psoriasis and other concomitant diseases. In this study, the data have been collected from a hospital in Saudi Arabia. In this research, we studied the factors affecting the presence of ocular diseases of patients. Here the study is based on variables of three categories which are demographic variables, medical as well as family history of the patient and concomitant diseases.

METHODOLOGY

This was a cross-sectional prevalence study which was conducted between March to May 2018 at a hospital of Saudi Arabia. Ethical approval for the study was obtained from ethical board of the hospital. Through convenient sampling, 120 patients were requested to participate in the study but 101 agreed to participate and filled the questionnaire and went through the screening. Hence, the participation rate 84.2%. Informed consent was obtained from the patients in which they agreed for detailed examination of their psoriasis and eye diseases. Inclusion criteria were (a) patients with psoriasis, (b) participants with age ≥18 years.

The information was taken by prepared pretested questionnaire(1). Questionnaire used for the present study adopted from a previously published study and provided to the patients during their visit to dermatologist. Questions translated into Arabic by a native Arabic language speaker after that those translated questions were provided to another person who also had Arabic as native language and sound knowledge of English. He translated the Arabic questions into English in order to ensure that the questions were carrying the same meaning in both English and Arabic versions. Hence, the study participants had both options, if they were comfortable with Arabic they provided the Arabic questionnaire and vice versa.

Demographic data e.g age, gender, marital status, nationality, height and weight of each patient were obtained through questionnaire. Then family history of the psoriasis and medical history were taken from the patients by the doctor before screening the patients (2). Patients were asked about site of psoriasis, onset of disease, swelling, morning stiffness, joint involvement, treatment and its duration.

Patients were also asked about prevalence of diabetes mellitus, hypertension, dyslipidemia and chronic disease. After getting history, patients were examined by the dermatologist, doctor screened the patients for number of sites involved and severity of psoriasis by using psoriasis area and severity index (PASI)(3). Patients' blood sugar, cholesterol and triglycerides were analyzed taking their blood sample. After having examination by dermatologist, patients were screened by ophthalmologist. Each patient received comprehensive ophthalmological examination. Prevalence of ocular complications among those patients was noted as separate variable (4–6).

Statistical package for social sciences (SPSS version 22) was used for data entry and analysis (7). Demographic data of the patients were presented in form of tables and graphs. Odd ratios were computed for the questions related to psoriasis and ocular complication. Chi-square test was used to study the relation between blood investigations with ocular complications among psoriasis patients as the test used by Arefin *et al* (8,9).

RESULTS AND DISCUSSION

Total number of patients participated in the study was 101. Some demographic data and medical history of patients such as age, nationality, gender, family history etc were obtained through questionnaire as found in study by Samy EL *et al* (2018) (2) and presented in Table-1. Among the total participants, 45 (44.6%) were male and 56 (55.5%) were female which indicates that majority of the participants were woman. Average age of a patient was 40.26± 15.4 (Mean ±SD) years (ranging from 13 to 80 years).

Table 1

Demographic Data and medical History of Patients

Parameters	**Value**
Total Participants (N)	101 (100%)
Age (Mean ± SD)	40.26 ± 15.4 years (range:13 to 80 years)
Sex	
Male	45(44.6%)
Female	56(55.5%)
Nationality	
Saudi	72(71.38%)
Non-Saudi	29(28.71%)
Family History	
Yes	40(39.6%)
No	61(60.4)
Medical History	
Diabetes	
Yes	69 (68.31%)
No	31 (30.69%)
Arthropathy	
Yes	45(44.6%)
No	56(55.5%)

Hypertension	
Yes	88(87.1%)
No	13 (12.9%)

The Table-1 shows 72% of the participants were from Saudi and rest were Non-Saudi. 40% of the patients had family history of psoriasis. Analyzing the medical history, we found that, 69(68.31%) patients and 88 (87.1%) patients suffering from psoriasis had concomitant diabetes and hypertension respectively.

Random blood sugar, cholesterol and triglycerides were analyzed by taking blood sample from each patient. The average of the parameters was recorded, and standard deviation (SD) was calculated. The parameters has been presented in the study as mean± SD. Blood sample analysis revealed that average random blood glucose level (mg/dl) was 113.3±26.9 (Mean ±SD). Average cholesterol level was 189.35± 49.7 mg/dl and average triglycerides level was found to be 124.25±50.0 mg/dl. Average systolic and diastolic blood pressure was found to be 126.0 ± 15.5 mmHg and 81.43 ± 8.0 mmHg respectively.

After getting history of the patients, they were examined by the dermatologist. The dermatologists observed the signs, and the patients were asked about the presence of the symptoms to evaluate the severity of psoriasis and psoriatic arthropathy. The patients were asked about the duration for which they had been suffering from psoriasis. On an average, a patient was found to be suffering from psoriasis for 11.4 ±9.9 years (the duration ranged from a minimum of 1 year to maximum 45 years). Doctor screened the patients for number of sites involved and evaluated severity of psoriasis via psoriasis area and severity index (PASI) score. Average Psoriasis Area and Severity Index (PASI) for the patients, as recorded by the dermatologists was found to be 5.94 ± 6.8.

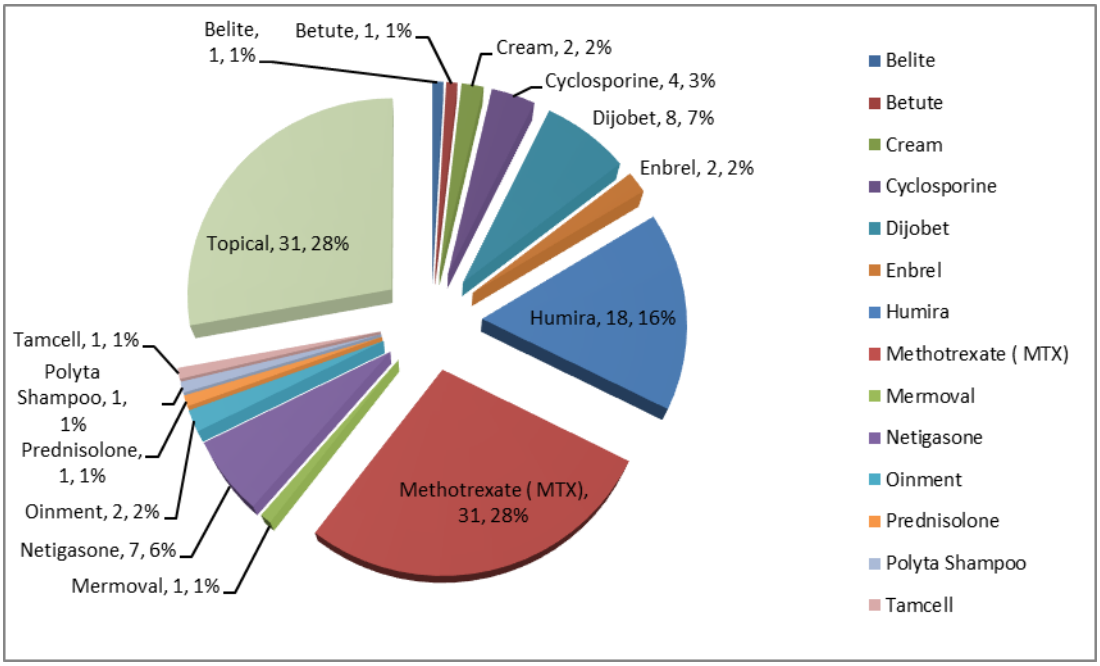

Figure 1: Patients suffering from Psoriasis under Different Treatment modalities

The patients suffering from Psoriasis were found to be under different treatment modalities. Figure 1 shows the mostly used treatment approach was Methotrexate (MTX) (31%) and Topical formulations (31%). The next one is Humira prescribed to 16% patients. Dijobet, Netigasone, Cyclosprorine were found to be recommended to 8%, 6% and 4% patients respectively. Each of Enbrel, cream and ointment was prescribed for 2% patients seapartely. Belite, Betute, Mermoval, Prednisolone, Polyta Shampoo, Tamcell all of these modalities were recommended to 1% patients individually.

Table 2

Association of Ocular complication to psoriasis, history of psoriasis and arthropathy (Odds Ratio analysis)

Variable	Response	Ocular Complication		Odds Ratio	95% Confidence Interval	P value
		Present number (%)	Absent number (%)			
Psoriasis	Present	46(71.9)	24(64.9)	1.38	0.58, 3.3	0.46
	Absent	18(28.1)	13(35.1)			
History of Psoriasis	Yes	61(95.3)	32(86.5)	1.1	0.96, 1.3	0.11
	No	3(4.7)	5(13.5)			
Psoriatic Arthropathy	Yes	27(42.2)	5(13.5)	3.1	1.3, 7.4	0.003*
	No	37(57.8)	32(86.5)			

**Statistically significant (95% confidence level, level of significance 0.05)*

We researched whether there is any correlation of psoriasis, history of psoriasis and arthropathy to prevalent ocular complication by evaluating Odds ratio (4,10,11). 71.9% percent of patients with a diagnosis of psoriasis had ocular complication as opposed to 64.9 % of patients without this diagnosis. The estimated odds ratio between ocular complication and prevalence of psoriasis was 1.38 which is greater than 1 at 95% confidence interval (significance level of 0.05), but statistically insignificant (P-value 0.46). Similarly, 61% of patients with a history of psoriasis had ocular complication as opposed to 32% without this diagnosed (OR 1.1, 95% CI 0.96–1.3, P value 0.11). In both cases, as the P value is insignificant at significance level of 0.05, the correlation is not statistically significant. However, OR between psoriatic arthropathy and ocular complication was 3.1 which is greater than 1 at 95% confidence interval (significance level of 0.05), and statistically significant (p-value 0.003). So, our study found significant association between the prevalence of psoriatic arthropathy and ocular complication (Table 2).

Table 3

Correlation of Eye disease to concomitant diseases (Chi-square Test)

Variables	**Responses**	**Ocular Complication n (%)**		**P-value**	**Cataract**		**P-value**
		Yes	**No**		Present	Absent	
Diabetes Mellitus (DM)	Yes	26(40.6)	4(10.8)	0.002*	9(30%)	21(70%)	0.001*
	No	38(59.4)	33(89.2)		4(5.6%)	67(94.4%)	
Hypoparathyroidism (HPT)	Yes	23(35.9)	4(10.8)	0.006*	10(37%)	17(63%)	<0.001*
	No	41(64.1)	33(89.2)		3(4.1%)	71(95.9%)	
Dyslipidemia	Yes	25(39.1)	6(16.2)	0.016*	6(19.4%)	25(80.6%)	0.19
	No	39(60.9)	31(83.8)		7(10%)	63(90%)	

**Statistically significant (95% confidence level, level of significance 0.05)*

We used Pearson Chi-square test (4,12) to study the correlation between ocular complication and cataract to blood investigations among psoriasis patients (Table 2). Table 2 indicates that the P value for patients having diabetes mellitus and ocular complication and the P value for patients having diabetes mellitus and cataract are 0.002 and 0.001 respectively at significance level of 0.05. So, it can be said that correlation of prevalence of diabetes mellitus and ocular complication and the correlation of prevalence of diabetes mellitus and cataract both are statistically significant. The P value for patients prevalence of hypoparathyroidism and ocular complication and that for patients having hypoparathyroidism and cataract are 0.006 and <0.001 respectively which match the findings of Tasli and Akbas (2020) (6). So, there is statistically significant correlation between the prevalence of hypoparathyroidism and ocular complication and there is statistically significant correlation between the prevalence of having hypoparathyroidism and cataract. There is statistically significant relation of having dyslipidemia and ocular complication (P value 0.016) at significance level of 0.05 which is similar to the research findings of Samy El *et al* (2018) and Heydari *et al* (2,5). But the correlation of prevalence of dyslipidemia and cataract is not statistically significant (P value 0.19) as consistent with the findings of the research by Wang *et al*(2012) (13).

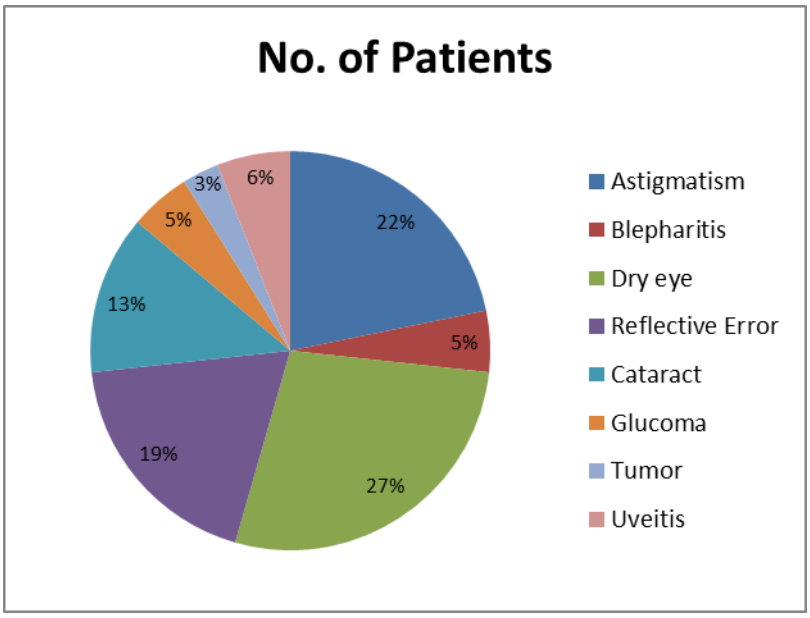

Figure 2: Ocular complications among the patients

We studied the types of ocular complications reported in the patients participated (Figure 2). The most commonly observed complications were dry eye (27%), astigmatism (22%), tumor (19%), and cataract (13%).

Table 4

Association between presence of cataract and topical steroid use

Topical Steroid Use	Cataract		Odds Ratio	Confidence Interval	P-value
	Present number (%)	Absent number (%)			
Present	9(69.2)	27(30.7)	5.08	1.44, 17.96	0.007*
Absent	4(30.8)	61(69.3)			

**Statistically significant (95% confidence level, level of significance 0.05)*

We studied whether there is any association between presence of cataract and topical steroid use (Table 4) as there are some studies indicating a correlation between these (14). The estimated odds ratio between prevalence of cataract and topical steroid use was 5.08 which is greater than 1 at 95% confidence interval (significance level of 0.05) and statistically significant (P-value 0.007). So, we found that the association between presence of cataract and topical steroid use was statistically significant.

CONCLUSION

The purpose of this study was to analyze the association of ocular disease to psoriasis and other concomitant diseases. The study has the limitation that the sample size is small, and it has focused on a specific population. But the previous studies also have similar findings in

some cases. We found a significant correlation between ocular complication and psoriatic arthropathy. Our research identified a significant correlation of diabetes mellitus and ocular disorders prevalence, as well as a significant correlation of diabetes mellitus and cataract prevalence. We have reported a significant correlation between hypoparathyroidism prevalence and eye complication as well as a significant correlation between hypoparathyroidism and cataract prevalence. Dyslipidemia and ocular complication have been seen to be associated greatly. Our analysis identified a correlation between cataract involvement and topical usage of steroids. Our results based on the traditional treatment approaches in Saudi Arabia. There are potential testing possibilities for larger sample sizes and diverse tests. Our research results demonstrate that careful management of associated diseases will prevent the onset and seriousness of ocular diseases.

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