Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2016; 4(7F):2729-2731 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI: 10.36347/sjams.2016.v04i07.088

Original Research Article

Relation of Climate Droplet Keratopathy (CDK) with Occupation and Other Diseases

Dr. Naishadh Jivrajani, Dr. Sfoorti Goswami, Dr. Visalakshi Subramanian, Dr. Sudha Jeyaram, Dr. Chandrakanth, Dr. Amita Nair
Sankara eye hospital, Krishnankoil – 626190, Tamilnadu, India

***Corresponding author**
Dr. Naishadh Jivrajani
Email: path.pdumc@gmail.com

Abstract: Climatic droplet keratopathy (CDK) is an acquired degeneration of the cornea. Climatic droplet keratopathy consists of a degenerative change that occurs in the cornea and is characterized by the accumulation of aggregates of small golden-yellow globules of various sizes that accumulate in the subepithelial layers of the cornea. This is an Observational clinical study. Patients visited to our hospital from 1st January 2014 to 31st March 2016 were studied. Their complete medical records was studied and analyzed. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups. We strongly found Occupational association with CDK, especially, which are associated with sunlight working conditions i.e. UV exposure. Among them, those who work in Farm are more prone to get CDK. Occupation is NOT associated with type of CDK, but to the severity of CDK i.e. Grades of CDK. Hence if we educate the Susceptible patients for CDK according to their working conditions, to take proper Preventive measures, we can reduce the morbidity of the disease and hence their quality of life.
Keywords: Climatic droplet keratopathy (CDK), Cornea, Occupational disease, pterygium, Cataract.

INTRODUCTION:

Climatic droplet keratopathy (CDK) is an acquired degeneration of the cornea [1-3]. Climatic droplet keratopathy consists of a degenerative change that occurs in the cornea and is characterized by the accumulation of aggregates of small golden-yellow globules of various sizes that accumulate in the subepithelial layers of the cornea [1,8]. The accumulation of the globules primarily involves Bowman's layer; however, it may occur in the subepithelial area and superficial layers of the stroma once Bowman's layer is disrupted. The deposits in the epithelium may damage the corneal epithelium and the band-shaped configuration may extend to the center leading to decrease in vision. [1-3] .The translucent corneal deposits are composed of protein, but although they share some of the staining characteristics of degenerated protein, such as that found in pingueculae, their exact histochemical nature remains uncertain. The corneal deposits are thought to be derived from plasma proteins, which diffuse into the normal cornea, and may be photochemically degraded by excessive exposure to ultra-violet light (UV). The degraded protein material may then be deposited in the superficial stroma. UV light is now widely accepted to be the main etiological factor in the pathogenesis of CDK [4, 5].

Two types of CDK are recognized. Primary CDK is characterized by corneal lesions that occur without other ocular or corneal disorders. Secondary CDK is associated with other ocular disorders, corneal vascularization and scarring [1, 8].

The predisposing factors appear to be similar, and these types of CDK occur more frequently in men than women. It is presumed that exposure to environmental irritants, such as evaporation and microtrauma caused by windblown dust and UV radiation, may predispose to CDK [1,7,8]. UV light from solar irradiation is considered as a main causal factor which is common to all geographic locations. Cataract and pseudoexfoliation are common among patients with CDK [1, 5].

Grading of CDK has been classified into three grades: Grade 1, mild spherule deposition near the limbus; Grade 2, moderate spherule deposition with band-shaped haziness and Grade 3, large yellow

aggregates of subepithelial droplets spherules reaching the central part of the cornea [6].

There is powerful epidemiological support for an association between chronic UVR exposure and the formation of cataracts and pterygia. The evidence in support of UVR linkage to pinguecula, ocular neoplasms and retinal changes is weaker-in part because there are fewer studies reported in the literature [9]. Ocular exposure to UV-B is also associated with several corneal changes, pterygium, climatic droplet keratopathy, and acute photokeratitis (snow blindness). Significant reduction in ocular UV-B exposure results from the use of eyeglasses and hats.

UVR-blocking hydrogel contact lenses and spectacles are two equally effective preventive measures in minimizing unnecessary suffering and health costs, especially for people who spend a significant time outdoors and for those who live in more UV intense environments. UVR-blocking contact lenses and spectacles must not, however, be substitutes in situations that require UVR-blocking safety goggles [9]. Simple measures such as wearing a hat or spectacles protect the eye and could potentially reduce the amount of pterygium and climatic droplet keratopathy attributable to UV radiation exposure [10]. To the best of our knowledge there are very few or no studies related to effects of protective measures on CDK, or any prospective studies done specifically for CDK.

MATERIAL AND METHODS:

This is an Observational clinical study. Patients visited in year 2014 to our hospital from 1st January 2014 to 31st March 2016. Their complete medical records was studied and analysed. Statistical Methods: Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data is made, **Assumptions: 1.**Dependent variables should be normally distributed, 2.Samples drawn from the population should be random, Cases of the samples should be independent

Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

Significant figures:

+ Suggestive significance (P value: $0.05<P<0.10$)

* Moderately significant (P value: $0.01<P \leq 0.05$)

** Strongly significant (P value: $P \leq 0.01$)

Statistical software: The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1 ,Systat 12.0 and R environment ver.2.11.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

RESULTS AND DISCUSSIONS:

In our study we found the following results:

Age & Gender are not associated with type of CDK. (P=0.205 & 0.932 respectively). Age is associated with Grade of CDK, BUT Gender is not associated with Grade of CDK. NS2, NS2 PSC, NS4, NS4 PSC are NOT associated with Type of CDK, BUT significantly correlated with grade of CDK.

Occupation distribution is not associated with type of CDK (P=0.846), BUT strongly associated with grade of CDK (P=0.001).

PXF distribution is not associated with type of CDK (P=0.446), BUT strongly associated with grade of CDK (P=0.002). Pterygium distribution is not associated with type of CDK (P=0.420), BUT strongly associated with grade of CDK (P=0.008).

We strongly found that Occupational association with CDK, occupation especially which are associated with sunlight working conditions i.e. UV exposure. Among them, those who work in Farm are more prone to get CDK. Occupation is NOT associated with type of CDK, but to the severity of CDK i.e. Grades of CDK.

We found that NS2, NS2 PSC, NS4, NS4 PSC are strongly associated with Grade of CDK and not with type of CDK. Also we found that PXF is associated with severity of CDK (Grade of CDK) and NOT associated with type of CDK. Similarly we found that Pterygium is associatd with severity of CDK (Grade of CDK) and NOT associated with type of CDK.

As per best of our knowledge the previous studies have not distinguished between type and grades of CDK and its association, which we found that the above conditions are strongly associated with Severity of CDK and not to the Type of CDK. Previously done studies are done for the all eye disease which are associated with sunlight exposure, and not specific for CDK.

Table 1: Occupation distribution of patients studied

Occupation	No. of patients	(%)
Farmer	56	48.3
Laborer	20	17.2
Businessmen	13	11.2
Housewife	12	10.3
Driver	8	6.9
Firecracker worker	5	4.3
Construction labor	1	0.9
Postman	1	0.9
TOTAL	116	100

Table 2 Age distribution of patients studied in relation to type of CDK

Age in years	Type of CDK		Total
	Primary	Secondary	
<50	2	1	3
50-60	13	3	16
61-70	37	26	63
71-80	22	6	28
81-90	5	1	6
TOTAL	79	37	116

In the above table, P=0.205, Not significant, Fisher Exact test.

Table 3: Gender distribution of patient studied in relation to type of CDK

Gender	Type of CDK		Total
	Primary	Secondary	
Male	25	12	37
Female	54	25	79
TOTAL	79	37	116

In the above table, P=0.932, Not significant, Fisher Exact test. So, Age is strongly associated with grade of CDK, BUT Gender is neither associated with type nor Grade of CDK

Table 4: Correlation between types of CDK with CATARACT

VARIABLE	CDK type	P value
	Correlation coefficient	
NS2	0.77	0.41
NS2PSC	-0.009	0.927
NS3	-0.83	0.375
NS3PSC	-0.134	0.152
NS4	-0.111	0.235
NS4PSC	0.128	0.171
SMC	0.031	0.743

There is NO Statistically significant correlation found BETWEEN TYPE OF CDK & CATARACT

CONCLUSION:

There is a strong association of Severity of CDK with Age, Occupation, SIMC, PXF & Pterygium, & not with Type of CDK. Gender is not associated with CDK.

Hence if we educate the Susceptible patients for CDK according to their working conditions, to take proper Preventive measures, we can reduce the morbidity of the disease and hence their quality of life.

There is a Mention in literatures that practicing veil like protective measures by women, wearing hat, etc. severity of CDK is less in them. Hence as ours was observational study, we require further studies to support the effects of Protective measures which can reduce the morbidity of the disease.

REFERENCES:

1. Copeland R.A, Afshari N.A, Dohlman C.H; Copeland and Afshari's Principles and Practice of Cornea: JP Medical Ltd, 2013; 1.
2. Duhaiman AS, Aprahamian S, Gorban AM, Shoukrey N, Tabbara K.F; Biochemical analysis of climatic droplet keratopathy. Saudi Bull Ophthalmol. 1988; 3(3):147-9.
3. Tabbara KF; Climatic droplet keratopathy. Int Ophthalmol Clin. 1986; 26(4):63-8.
4. Gray R.H, Johnson G.J, Freedman A; Climatic droplet keratopathy. Survey of ophthalmology, 1992; 36(4): 241-253.
5. Taylor H.R; Aetiology of climatic droplet keratopathy and pterygium. British Journal of Ophthalmology, 1980; 64: 154-163.
6. Gray RH, Johnson GJ, Freedman A; Climatic droplet keratopathy. Surv Ophthalmol. 1992; 36(4):241-53.
7. Urrets-Zavalia JA, Knoll EG, Maccio JP, Urrets-Zavalía E.A, Saad J.A, Serra H.M; Climatic droplet keratopathy in the Argentine Patagonia. Am J Ophthalmol.2006; 41(4):744-6.
8. Viswamithra Murthy CM; Spheroidal Degeneration –An Epidemiological Study; IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) 2015; 14(8): 48-53.
9. Bergmanson J.P.G, Söderberg P.G; The significance of ultraviolet radiation for eye diseases. A review with comments on the efficacy of UV-blocking contact lenses. Ophthalmic and Physiological Optics, 1995; 15(2): 83-91.
10. Taylor H.R, West S.K, Rosenthal F.S, Munoz B, Newland H.S, Emmett E.A; Corneal changes associated with chronic UV irradiation. Archives of Ophthalmology, 1989; 107(10):1481-1484.