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Original Research Article

A Study of Risk Factors for Climatic Droplet Keratopathy in Elderly Persons from Western Rajasthan

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Abstract: Climatic Droplet Keratopathy is an acquired degeneration of cornea. It is characterised by the deposition of amber coloured oily spherules at and around the Bowman's membrane of the cornea. The disease occurs in areas where exposure to ultraviolet (UV) light is excessive. Climatic droplet Keratopathy is a common ocular morbidity in this part of country. Intense sunshine, excess UV radiation, micro trauma due to wind borne particles, extremes of high or low temperature, aridity, malnutrition and genetic factors were incriminated as the etiological factors for the development of Climatic Droplet Keratopathy. We studied about the relation of Climatic Droplet Keratopathy to age, sex, laterality, familial pattern and working hours in sunlight. Climaticdropletkeratopathymaybepreventedbywearing UV blocking sunglasses in areas of sand and dust. Side protectors of the sunglasses may have to be placed to preventexposureto environmental irritants.
KeywordsClimatic droplet keratopathy, Corneal Degeneration

INTRODUCTION:

Climatic droplet keratopathy (CDK) is an acquired degen-eration of the cornea.Climatic Droplet Keratopathy is an acquired degeneration of cornea. It is characterised by the deposition of amber coloured oily spherules at and around the Bowman's membrane of the cornea [1-3]. There are many synonyms of this entity including Bietti's band-shaped nodular dystrophy, Labrador keratopathy, spheroidal degeneration, chronic actinic keratopathy, oil droplet degeneration, elastoid degeneration, keratinoid corneal degeneration, hyaline degeneration and Nama keratopathy. This diversity is related to the variation in the geographic distribution of this entity. Bietti made his initial clinical observation in southwest region of Saudi Arabia [4]. The disease occurs in areas where exposure to ultraviolet (UV) light is excessive [5-7]. Climatic Droplet Keratopathy is a common ocular morbidity in this part of our country. Intense sunshine, excess UV radiation, micro trauma due to wind borne particles, extremes of high or low temperature, aridity, malnutrition and genetic factors were incriminated as the etiological factors for the development of Climatic Droplet Keratopathy. We studied about the relation of Climatic Droplet Keratopathy to age, sex, laterality, familial pattern and working hours in sunlight.

MATERIALS AND METHODS

Materials:

Hospital based non-randomized observational study. All Patients attending Eye OPD MDM Hospital, Jodhpur with features of Climatic Droplet Keratopathy were enrolled for study after receiving informed written consent. This study was conducted over a period of 6 months from July 2015 to December 2015 and total 93 patients were included who were above 50 years of age at the time of diagnosis.

Exclusion criteria

1. Active or previous eye infection/inflammation, glaucoma, history of previous eye trauma, history of contact lens uses, retinal pathology, regular use of any eye drop.
2. Those who refused for consent.

METHODS:

Informed consent was obtained from each participant. Age, gender, demographic details, occupation (working hours in sunlight), visual acuity, intraocular pressure was recorded. Slit lamp examination was performed and grading of corneal keratopathy was done accordingly. Detailed fundus examination was done. Tear film status was examined

using Schrimer test and Tear film break up time recorded.

RESULTS

Out of total 93 patients of CDK only 6% were of age less than 60 years. 61% patients were of age group of 66–70 years. 23.65% patients were of age group of 60-65 years of age. CDK was observed predominantly in males. Out of total patients 93.54% were male. 94.62% patients were from rural areas.

In our study 100 percent of the patients had bilateral CDK. Most of the patients were working more than 8 hours per day in bright sunlight. 73 % of patients had clear-cut history of more than 8 hours per day of outdoor activity during their adulthood. 26.88% patients had history of 4-8 hours working in bright sunlight during their adulthood. None of them had worked less than 4 hours per day in bright sunlight during their adulthood.

Family history was positive in only 7.52% of cases.

Table 1: Age wise distribution of CDK

AGE	Number (n=93)
<60 years	06 (6.45%)
60-65 years	22 (23.65%)
66-70 years	57 (61.29%)
>70 years	08 (8.6%)

Table 2: Sex wise distribution

SEX	Number (n=93)
Male	87 (93.54%)
Female	06 (6.45%)

Table 3: Rural versus urban

Area	Number (n=93)
Rural	88 (94.62%)
Urban	05 (05.37%)

Table 4: Unilateral versus Bilateral

Laterality	Number (n=93)
Unilateral	00(0%)
Bilateral	93(100%)

Table 5: Working hour per day (outdoor working hours)

Outdoor working hours per day	Number (n=93)
<4 hours	00 (0%)
4-8 hours	25 (26.88%)
>8 hours	68(73.11%)

Table 6: Family history

Family history	Number (n=93)
Positive	07 (7.52%)
Negative	86 (92.47%)

DISCUSSION

Climatic droplet keratopathy consists of a degenerative changethatoccursinthecorneaandischaracterizedby the accumulation of aggregates of small golden-yellow globules of various sizes that accumulate in the sub epithelial layers of the cornea. The accumulation of this materialoccursnearthelimbus inearly stagesandmay progress toward thecenter of thecorneain thehorizontal meridianwithaband-shapedfashion [8]. Theaccumulationof theglobulesprimarilyinvolvesBowman'slayer;however, it may occur in the sub epithelial area and superficiallayers ofthestromaonceBowman'slayerisdisrupted [1-3]. Thedeposits in the epithelium may damage the corneal epithelium and theband-shapedconfiguration mayextendtothecenter leading to decrease in vision.

TwotypesofCDKarerecognized.PrimaryCDKis characterizedbycorneallesionsthatoccurwithoutother ocular or corneal disorders. Secondary CDK is associated with other ocular disorders, corneal vascularization and scarring.Thepredisposingfactors are similar though. Both ofthesetypesofCDKoccurmorefrequentlyinmenthan women. Eyes exposed to environmental irritants,suchasevaporationandmicro traumacaused by windblown dust and UV radiation, are predisposed to CDK. UV light from solar irradiation is considered as a main causal factor which is common to all geographic locations. Thepreponderanceofmenprobablyreflects their outdoor activities and exposure to environmental irritants such as sand, dust, wind and sunlight.

GradingofClimatic Droplet Keratopathyhasbeenclassifiedintothreegrades: Grade1:mildspheruledepositionnearthelimbus;Grade 2: moderatespherule depositionwith band-shaped haziness and Grade 3: largeyellow aggregates of sub epithelial droplets spherules reaching the central part of the cornea [9]. Anothergradingoftheconditiondependingontheseverity isasfollows:trace(smallnumberofdepositsinoneeye or only at the end of the interpalpebral strip in each eye(if bilateral);Grade1(sparingofcentralcorneawithinvolveme ntofmedialandlateralinterpalpebralstrips);Grade 2 (affected central cornea but no effect on visual acuity); Grade 3 (central cornea is affected with reduced vision) andGrade4 elevatednodulesinadditiontothefindingsof Grade 3) [10].

CONCLUSION

Climatic droplet keratopathy is seen predominantly in older persons. It is more common in males as compared to females and was bilateral in all the cases. It is more common in persons working in sunlight for prolonged duration particularly in persons who works more than 8 hours per day in bright sunlight. Climaticdropletkeratopathymaybepreventedbywearing UV blocking sunglasses in areas of sand and dust. Side protectors of the sunglasses may have to be placed to preventexposureto environmental irritants. Avoiding solar irradiation andrepeatedmicro traumaofthecorneamayalso preventtheformationofClimatic Droplet Keratopathy.

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