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Diffuse retinal pigment epitheliopathy among the inhabitants of Brahmaputra Valley of India

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PURPOSE. *To analyze the patient demography and the various fluorescein angiography (FA) features of diffuse retinal pigment epitheliopathy (DRPE) cases among the inhabitants of the Brahmaputra Valley of India and to see if there is any ethnic variation in its clinical presentation and risk factors.*

METHODS. *This is a retrospective study in a clinical practice setting with study population of Aryan and Mongoloid races. Data analysis of 30 cases (40 eyes) of DRPE of 262 consecutive cases of central serous chorioretinopathy (CSC) was done. The various features of these cases were compared and statistically evaluated with the findings of CSC cases with symptom duration of 6 months or more and cases with recurrent episodes.*

RESULTS. *A total of 11.45% had DRPE that had average symptom duration of 3.50 years. Logistic regression showed high risk for DRPE if sensory retinal detachment (SRD) persists for more than 18 months. Systemic hypertension was another significant risk factor, whereas multiple RPE leaks appeared to be weakly significant. DRPE was predominant in eyes of patients having first acute episode of CSC in later age and fairly large retinal pigment epithelial detachments (PEDs) contributed to its development. Role of exogenous corticosteroid, retinotoxic drugs, and tobacco consumption could not be assessed properly due to inadequate sample size.*

CONCLUSIONS. *The main factor for the development of DRPE is the persistence of SRD for more than 1.50 years. Fairly large leaking PED and onset of primary CSC in later age appear to contribute towards its development. Except for these, no major variation from Western studies was observed. (Eur J Ophthalmol 2008; 18: 578-86)*

KEY WORDS. *Chronic central serous chorioretinopathy, Diffuse retinal pigment epitheliopathy, Recurrent central serous chorioretinopathy, Retinal pigment epithelial atrophic tract, Retinal pigment epithelial detachment*

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INTRODUCTION

Zweng and Little (1) in 1977 coined the term diffuse retinal pigment epitheliopathy (DRPE) for a condition which had diffuse hyper- and hypopigmentation in the retinal pigment epithelium (RPE), shallow sensory retinal detachment (SRD), no active fluorescein leak, a chronic course, often bilateral, recurrent in nature, poor visual prognosis, and the patients were on an average 3.4 years older than those with central serous chorioretinopathy (CSC). Subsequent reports (2-4) added a few more features like association of multiple subretinal foci of leakage, presence of multiple serous pigment epithelial detachments (PEDs), frequent field defect corresponding to RPE degeneration, dyschromatopsia, and electro-oculogram abnormalities. Such cases had been previously documented without any particular term being assigned (5-8). Initially, several investigators (1-3) thought it to be a separate entity from CSC and some (9-11) described these cases under different names. The present trend is to consider DRPE to be

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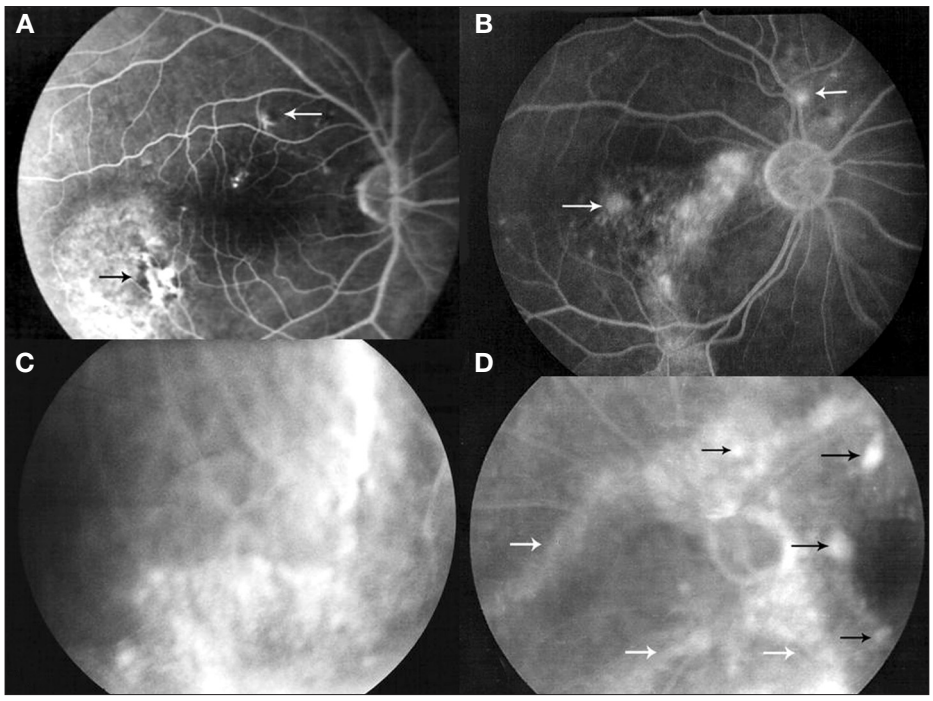

Fig. 1 - (A) *Fluorescein angiographic (FA) findings of right eye of a 55-year-old patient showing a large patch of retinal pigment epithelium (RPE) atrophy with evidence of a spontaneously collapsed pigment epithelial detachment (PED) (arrow). An isolated small collapsed PED (arrow) and three point leaks are also seen.* **(B)** *FA of the right eye of a 45-year-old patient shows a decompensated RPE tract contiguous with multiple RPE leaks. Top arrow shows an inkblot leak, bottom arrow a PED. Several window defects are visible in the parafoveal area and above the optic disc.* **(C)** *FA of the left eye of a 51-year-old patient shows a descending RPE atrophic tract, which expanded in the peripheral part.* **(D)** *FA findings of the left eye of a 52-year-old patient show peripapillary RPE atrophy and three obliquely descending tracts in the nasal half of the retina. White arrows show RPE atrophic tract and black arrows show PED.*

synonymous with chronic CSC, which is thought to be a more severe and rarer form of the disease occurring in patients older than 50 years (12-15), particularly in Asian and Hispanic patients. Castro-Correia and associates (12) thought it to be the terminal state of most severe cases of CSC. Several investigators (3, 7-12, 16-18) are of the opinion that the visual prognosis is grave in many of these cases.

CSC is not uncommon among the inhabitants of the Brahmaputra Valley of India. This valley is traversed by a large river Brahmaputra, situated amidst the Himalayan range of hills in the northeastern part of India. This valley has a mixed population of Aryan and Mongoloid races. The objective of this study is to analyze the patient demography and the various fluorescein angiography (FA) features of DRPE cases among the inhabitants of this part of India and to see if there is any ethnic variation in its clinical presentation and risk factors.

METHODS

This retrospective observational case series analyzed the medical records of 262 of 323 consecutive CSC cases attending a referral Eye Care Centre located in northeast India within a span of 5 years. Of these 262 cases, 30 (40 eyes) had DRPE.

Selection criteria

The cases were selected for this study as per the following definitions: DRPE is defined in eyes of the patients with/without history of acute CSC in the affected or in the fellow eye with patches of overt RPE atrophy or decompensation revealed on FA without any clinical evidence of intraocular inflammation, which in totality could roughly cover an area of 4 disc diameters or more either in the posterior pole (Fig. 1A) or rarely in the periphery of the eye. The findings could be RPE atrophic patch/tract contiguous with the original point of RPE leakage (Fig. 1B), isolated atrophic patches, descending atrophic tract that may enlarge towards the periphery (Fig. 1C), multiple atrophic tracts (Fig. 1D), geographic atrophic patches, presence of decompensatory leaks and pigment migration/hyperplasia in the atrophic patches, presence of PED or evidence of spontaneously collapsed PED, along with the decompensated or atrophic RPE. Acute CSC was diagnosed by the presence of visual symptoms like blurred vision, positive central scotoma in Amsler grid, micropsia, metamorphopsia, loss of color saturation, chromatopsia, and blister-like SRD in the posterior pole of the eye with or without PED, but devoid of other possible causes of exudation like inflammation, infiltration, or choroidal neovascular-

ization (CNV) due to other choroidal pathology. FA findings of point leak, inkblot-leak, smokestack leak, diffuse leak, window defect, and PED were used for confirmation of the diagnosis. Chronic CSC was defined by the presence of symptoms/SRD of at least 6 months duration. Recurrent CSC was defined by the presence of previously documented acute CSC at our center or elsewhere or by the history of previous acute episode suggested by symptoms of CSC in the individual eye.

Exclusion criteria

Nonperformance of FA at the time of presentation in first acute episodes and follow-up FA in recurrent cases, cases with clinical evidence of active/healed intraocular inflammation, congenital pit in the optic nerve head, or age-related macular degeneration (AMD), and cases with evidence of diabetic/hypertensive retinopathy. Most of the cases were rejected because of nonperformance of FA.

TABLE I - BREAKUP OF NON-PRIMARY CENTRAL SEROUS CHORIORETINOPATHY (CSC) CASES INTO NON-OVERLAPPING GROUPS

DRPE in non-primary CSC cases	No. of cases
Unilateral recurrent CSC	64
Bilateral recurrent CSC	6
Unilateral chronic CSC	13
Bilateral chronic CSC	1
Unilateral DRPE in recurrent CSC	3
Unilateral DRPE in chronic CSC	9
One eye DRPE in recurrent CSC and other eye asymptomatic DRPE	1
One eye recurrent CSC and other eye asymptomatic DRPE	1
One eye DRPE in chronic CSC and other eye recurrent CSC	2
One eye chronic CSC and other eye asymptomatic DRPE	1
One eye DRPE in chronic CSC and other eye asymptomatic DRPE	3
One eye DRPE in recurrent CSC and other eye recurrent CSC	1
One eye chronic CSC and other eye recurrent CSC	1
One eye DRPE in chronic CSC and other eye DRPE in recurrent CSC	3
Unilateral asymptomatic DRPE	3
Bilateral asymptomatic DRPE	3
Total of non-primary CSC cases	115

CSC = Central serous chorioretinopathy; DRPE = Diffuse retinal pigment epitheliopathy; FA = Fluorescein angiography; RPE = Retinal pigment epithelium; PED = Pigment epithelial detachment; SRD = Sensory retinal detachment

Observation procedure

Medical records of the 262 selected cases were reviewed with special emphasis on the clinical and FA features, their relation to the duration of the SRD, age at presentation, age at first acute episode, previous systemic corticosteroid usage or any other medication, sex, laterality, the history of recurrences, presence of systemic diseases, stress, and the ultimate visual outcome on the day of final visit. All the patients had given consent at the time of doing investigations for utilization of the data in future research work. The various features of DRPE cases were compared and statistically evaluat-

TABLE II - SALIENT FEATURES OF ALL DRPE CASES OUT OF 262 CONSECUTIVE CHRONIC (SYMPTOM / SRD DURATION OF 6 MONTHS AND MORE) AND RECURRENT CSC CASES

Features	Findings
Number of patients	30 cases
Number of eyes	40 eyes
Males	27/30 cases (90.00 %)
Bilateral	10/30 cases (33.33 %)
Age at presentation	Median : 49 ±12.09 yrs; Range: 30 -73 yrs.
Age at first acute episode	Median: 41 ± 8.31 yrs; Range: 25 – 54 yrs.
Symptom duration (chronic CSC eyes only)	Median: 3.5 ± 8.41 yrs; Range 0.5 - 30 yrs.
DRPE in Chronic CSC	17/34 eyes (50.00 %)
DRPE in Recurrent CSC	8/89 eyes (08.99 %)
DRPE in asymptomatic eyes	15/40 eyes (37.50%)
Stress	14/17 cases (82.35%); 13 - not recorded.
Hypertension	13/30 cases (43.33 %)
Diabetes	7/30 cases (23.33 %)
Gastritis	3/30 cases (10.00 %)
H/O Malaria	3/30 cases (10.00%)
Tobacco	10/15 cases (66.66%); 15 – not recorded.
No leak on FA	20/40 eyes (50.00%)
Single leak	12/40 eyes (30.00%)
Multiple leaks	8/40 eyes (20.00%)
RPE atrophic patch/s	34/40 eyes (85.00%)
RPE diffuse leak	10/40 eyes (25.00%)
RPE atrophic tract/s	26/40 eyes (65.00%)
PED	13/40 eyes (32.50%)
SRD	9/40 eyes (22.5%)
Choroidal neovascularization	2 eyes (5.0 %)
BCVA on last visit (only extreme figures).	
20/20	9/40 (22.50%)
Less than 20/200	5/40 (12.50%)

TABLE III - COMPARISION OF SALIENT FEATURES OF DRPE AND NON-DRPE EYES AND THEIR STATISTICAL ANALYSIS

Features	Non – DRPE eyes (No. = 98)	DRPE eyes (No. = 40)	p-value	Significance of p-value
Mean age at first acute episode	36.08 ± 7.68 yrs. (median: 35yrs.)	39.93 ± 8.31yrs. (median: 41yrs.)	0.026* (0.033)†	SIG at 5% {SIG (at 5%)}
Median symptom duration	11.00 ± 6.07 months. (6 – 24 months.)	42±100.92 months. (6 –360 months.)	0.000†	SIG (at 1%)
Single RPE leak	50/98 (51.02%)	12/40 (30.00%)	0.024‡	SIG (at 5%)
Multiple RPE leak	33/98 (33.67%)	8/40 (20%)	0.111‡	Borderline weakly SIG
SRD	83/98 (84.69%)	9/40 (22.50%)	0.000‡	SIG (at 1%)
PED	21/98 (21.43%)	13/40 (32.50%)	0.171‡	NS
Steroid before	2/98 (2.04%)	3/40 (7.5%)	0.119‡	NS
Steroid after	9/98 (9.18%)	5/40 (12.5%)	0.558‡	NS
Point leak	36/98 (36.73%)	3/40 (7.5%)	0.001‡	SIG (at 1%)
Inkblot leak	26/98 (26.53%)	6/40 (15%)	0.145‡	NS
Smokestack leak	15/98 (15.31%)	0	0.009‡	SIG (at 1%)
Diffuse leak	22/98 (22.45%)	10/40 (25%)	0.747‡	NS
Decompensatory leak	7/98 (7.14%)	17/40 (42.50%)	0.000‡	SIG (at 1%)

* = t-test for difference of means, † = Mann Whitney U test; ‡ = z-test for difference of proportions, NS = Not significant; SIG = Significant; CSC = Central serous chorioretinopathy; DRPE = Diffuse retinal pigment epitheliopathy; FA = Fluorescein angiography; RPE = Retinal pigment epithelium; PED = Pigment epithelial detachment; SRD = Sensory retinal detachment

ed with that of non-DRPE recurrent and chronic cases together to find out the probable risk factors. In case of symptom duration, only the chronic cases were selected for comparison. It is assumed that presence of SRD is required for the persistence of the symptoms even if clinically blister-like swelling is not visible. Cases with first acute episodes were not considered for comparison as no DRPE-like fundus changes are seen in these cases.

Statistical analysis

Data were processed using SPSS 10.0 for Windows. The *t* statistic was used for testing significance of difference between means. To rule out the effect of extreme values in case of duration data, median as a measure of central tendency was preferred. The non-parametric Mann Whitney *U*-test was used to test the significance of difference between medians. The Z-test statistic for testing significance of difference in observed proportions was used for testing the significance of differences between the dichotomized parameters. Quantification of risk (with regard to the length of symptom duration) was arrived at using logistic regression.

RESULTS

Of the 262 selected cases, 147 (56.10%) had first acute (primary) episode and 115 (43.89%) had non-primary CSC comprised of recurrent, chronic, and DRPE cases (Tab. I). Of the primary cases, 131 (89.12%) were male, 15 (10.20%) had SRD in both eyes, 71 (48.29%) had various fluorescein angiographic findings suggestive of CSC in the fellow asymptomatic eyes, and the median age at presentation of this group was 37 years. Altogether 40 eyes of 30 cases (11.45%) had DRPE. Of these, 17 eyes (42.5%) had history of chronic episode, 8 (20.0%) had recurrent episodes, and in 15 eyes (37.5%), patients were unaware of the presence of CSC. Of the 8 eyes with recurrent episodes, 6 were laser treated earlier. Salient features of DRPE cases are shown in Table II. Table III shows the comparison between the features of DRPE and non-DRPE chronic and recurrent cases together and their statistical evaluation.

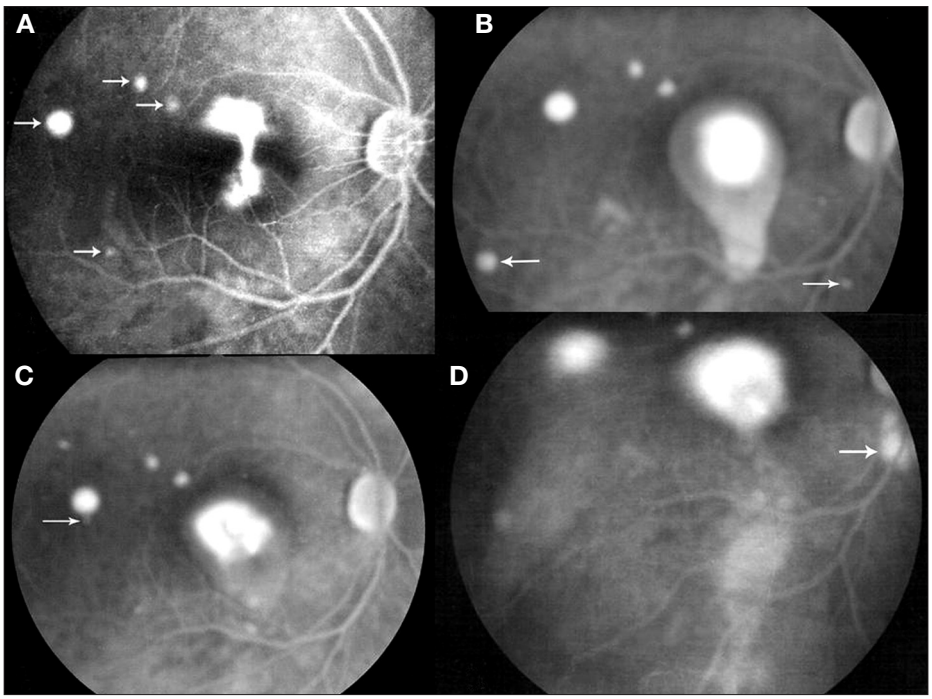

Fig. 2 - (A) *Fluorescein angiography (FA) of the right eye of a 30-year-old patient done on February 10, 2003, shows a smokestack leak just at the inferotemporal margin of the foveal avascular zone and three pigment epithelial detachments (PEDs). This patient had the first acute episode of central serous chorioretinopathy (CSC) in this eye for 2 weeks.* **(B)** *FA of the right eye of the same patient done on August 5, 2004, when he presented with an acute CSC in the fellow eye. It shows the beginning of the downward extension of the central sensory retinal detachment (SRD) and a faint descending decompensatory tract. Two new PEDs (arrows) were also visible.* **(C)** *FA of the right eye of the same patient done on April 30, 2005, revealed considerable dye accumulation in central SRD and beginning of downward extension of serous fluid (arrow) from a PED on the temporal side.* **(D)** *Late phase FA of the right eye of the same patient done on April 30, 2005, revealed two descending retinal pigment epithelium decompensatory tracts. This time two small dot-like fluorescent spots developed below the disc which coalesced and leaked dye (arrow).*

In this series, steroid-induced CSC cases were very few in number (Tab. III). This series had only one eye developing DRPE following a bullous exudative variant of CSC, which persisted for about 8 months. We have observed three descending atrophic tracts in the lower nasal half of the retina in one eye and double tracts in five eyes.

In the present series, 75% of the eyes with DRPE had symptoms lasting for more than18 months. In comparison, 80% of the eyes without DRPE had symptom duration of 18 months or less. Logistic regression analysis showed that the risk of DRPE goes up to 20.62 times if symptom duration was more than 18 months. The overall correct prediction percentage of this analysis was 81.3%. Figure 2 shows the evolution of DRPE in a patient aged 30 years.

DISCUSSION

In the majority of CSC cases spontaneous resolution occurs within 1 to 6 months (6, 8, 19-22). It has been observed that in 60%, resolution occurs within 3 months and in 20% it lingers for more than 6 months (23). On a long-term follow-up (12, 24), the natural course of the disease is found to be of the following types: 1) CSC with a single resolving episode; 2) recurrent resolving CSC; 3) recurrent chronic CSC; and 4) chronic CSC—persistence of SRD/symptoms beyond the usual period of recovery. Interestingly, several studies (8, 16, 25-30) have indicated that CSC is basically an asymmetrically developed bilateral chronic disease of the choriocapillary–RPE complex and the acute episodes are actually acute-on-chronic manifestation of the disease process due to various triggering factors. However, the present trend is to divide CSC into two clinical subtypes of acute or classic CSC and chronic CSC or DRPE (10, 17, 31-35). van Velthoven and associates (36) described these cases as active and inactive.

According to Yannuzzi and associates (37), DRPE represented around 4% of the CSC cases. Recent literature (4, 38-41), mostly from the European countries, documented 10% to 16% prevalence. In the present study it is also towards the higher side (11.45%). Definition of DRPE needs some precision, at least the RPE decompensation or atrophy needs quantification; otherwise, the prevalence will differ in different studies.

Several investigators (3, 8-10, 35, 41) observed DRPE to be in older age groups (median: 49.8–53.33 years). In the present series the median age at presentation was 49 years (range: 30–73 years) for DRPE eyes as compared to a median of 38 years for non-DRPE eyes of the recurrent and chronic cases together (Tab. III). This difference in medi-

an is significant (p=0.000). The mean age at first acute episode in DRPE cases was 39.93 years versus 36.08 years in non-DRPE cases (Tab. III). It appears that the first acute episode of CSC occurred at a later age in the eyes that developed DRPE (p value 0.026). This observation deserves attention, as this suggests the possibility of prolonged persistence of SRD following the primary acute episode in an aging retina. Bennett (19) observed recovery of acute CSC within 3 months in 65% of the eyes in patients under 45 years of age, whereas it required 6 months in patients above this age group. However, this finding was not statistically significant. Further study is needed to corroborate this observation.

Many investigators (8-10, 31) observed that prolonged persistence of subretinal fluid was responsible for the development of DRPE, but few studies (10, 12, 42) mentioned the time period required for it, which ranged from 3 to 5.6 years. The present study also found the median symptom duration of the DRPE to be 3.5 years. Analysis by logistic regression technique showed that persistence of symptoms/SRD at least for about 1.5 years was needed for development of RPE atrophy. It has already been mentioned that persistence of symptoms is presumed to be due to persistence of SRD. However, history of symptom duration may not be a very precise assessment particularly in recurrent cases. But in absence of a meticulous prospective study, we will have to be content with the crude estimation suggested by such retrospective studies.

There was borderline significant difference in proportion of multiple RPE leaks between DRPE and non- DRPE eyes (p=0.111). It is likely that presence of multiple RPE leakages might lead to chronic persistence of the SRD or appear to contribute towards the recurrent nature of the disease. Observation of all the recurrent cases clearly indicates that even though the clinical presentation of the disease may vary, the disease process is basically chronic. Recent indocyanine green angiography (ICGA) studies (43, 44) showed persistent nature of choroidal dye leakage after resolution of acute episode throughout the follow-up period. Shiraki and associates (44) opined that the static nature of ICG dye leakage in the choroid is likely to be related to persistent pathology in the subretinal pigment epithelial space, possibly causing chronicity and recurrences, particularly in severe CSC cases. By severe they meant chronic, as well as CSC with bullous retinal detachment. Contrary to common belief, the present study found DRPE to be more common in eyes with chronic episodes than with recurrent episodes of CSC (p=0.000). Lodato and Brancato (39) had similar observation in their series. In the asymptomatic eyes in which we have observed DRPE, there must have been prolonged SRD, but asymptomatic as the foveal area was spared or possibly due to absence of profuse leakage (38). In fact, many previous series on DRPE (9-11) had such type of cases.

Another finding that is commonly reported to be associated with DRPE is multiple small PEDs (1-3, 9-11, 42). Gass (45) observed association of fairly large PEDs with bullous variant of CSC. In the present series of DRPE cases, we found moderately large fresh leaking PED or spontaneously collapsed PED to be contiguous with the decompensated/degenerated RPE patches or descending tracts in 16 eyes. This series had only one eye with DRPE following bullous exudative detachment earlier. We also have not observed a statistically significant difference as regards the presence of PED in DRPE and non-DRPE eyes (Tab. III). A recent OCT study (36) found PED in 30% of the cases both in acute and chronic stages. In the present series by FA alone we could detect PED in 32.50% of DRPE cases. It appears that fairly large leaking PEDs persisting for a long time, which are also not possible to treat by laser, can lead to DRPE and after a considerable period of time the spontaneously settled PEDs, characterized by small depigmented area, some pigment clumping, and sometimes by the presence of drusen-like deposits (2, 46, 47), may not be distinguishable in the atrophic area.

In the present study gravity dependent RPE atrophic tracts were seen in 65% of eyes. We have seen multiple tracts on either half of the retina running obliquely downwards. This peculiar orientation of the tract/s depends on the position of the body at the time of sleep as the tracts are often seen in the same hemisphere of the eyes in bilateral cases. Figure 2 presents a fairly good idea about the time period required for the development of these tracts.

We have observed that 13 of 30 cases (43.33%) of DRPE were hypertensive. As these cases are usually detected in older age group, these patients are likely to be hypertensive in comparison to other cases. But two (33, 35) recently conducted retrospective case control studies found hypertension to be a risk factor for CSC. The present study also found it to be significant (p=0.039). Localized serous detachments are known to occur in accelerated hypertension (48), but whether prolonged chronic hypertension can produce pathologic changes in the choriocapillary resulting in CSC or they need occasional spikes of high blood pressure deserve study.

Haimovici and associates (35) described tobacco use as risk factor for CSC. As nicotine can affect the choroidal

circulation by its vasoconstrictive action (49, 50), its role in the production of CSC cannot be ruled out. Smoking and consumption of tobacco in various forms is quite common in this part of the country. In the present series, 10 out of 15 patients with DRPE were consumers of tobacco in some form (Tab. II), but the sample size is too small to form significant conclusions. Several studies (32, 51, 52) from Western countries, as well as from Japan (53), showed that steroid induced CSC cases are more prone to develop DRPE. As systemic corticosteroid therapy would lead to chronic persistence of CSC, development of DRPE would be the natural sequel. The number of such cases in this series is smaller for analysis (Tab. III). As regards drug toxicity, some patients had chloroquine therapy, but the history was not worthwhile for analysis.

This study has shown that the DRPE type of clinical picture does not exclusively represent the recurrent form of the disease or the end stage of the exudative bullous variant; rather it should be considered to be a sequel of prolonged persistence of SRD. Wang and associates (54) also observed that RPE atrophy is caused by the detachment and not by the primary disease process in CSC. Some earlier studies (55, 56) had reported association of DRPE with bullous exudative type of CSC. The present study has shown that it is the prolonged persistence of chronic SRD, not necessarily a massive exudative detachment, that is required for its development. While reviewing the literature, we noted some confusion regarding the terminology "severe variant." Should we reserve this term for the massive exudative type or to the small group of patients prone to develop DRPE that runs a protracted course? Our view is that the massive exudative type should be considered as the severe variant of CSC that may at times lead to DRPE depending upon the duration of SRD. Why a small group of people have persistent SRD for a long time either in chronic or recurrent chronic form is difficult to explain.

This study gives the impression that the development of DRPE passes through two stages: 1) RPE decompensation, which is probably reversible up to a certain period of time. After this critical period, which seems to be around 1.5 years, RPE decompensation becomes irreversible and gradually atrophy sets in; and (2) RPE atrophy, which is characterized by extensive RPE atrophy and clinical absence of subretinal fluid. PEDs may not be appreciable at this stage, as they are also collapsed and atrophic. Though clinically it looks like a burnt out stage of the disease process, few decompensatory leaks may be visible on FA and rarely subretinal hemorrhage may develop from development of choroidal neovascularization.

As this is a retrospective study, certain drawbacks are inevitable. A few variables did not have adequate data for statistical analysis, e.g., consumption of tobacco. Probability of bias could not be ruled out at the time of interpretation of collapsed PEDs in the RPE atrophic tracts or patches. Limitations in the calculation of time period required for the development of DRPE has already been mentioned. However, the following points emerge from this analysis: 1) prevalence of DRPE in this part of the country does not differ from that of European population; 2) development of DRPE requires persistence of SRD for a period of around18 months and above, which may be following a single acute episode (chronic CSC) or in recurrent cases usually with prolonged recovery time in each episode. This is not a new observation, but analysis was not done earlier by logistic regression. However, the required time period for its development differed from that of previous studies on Caucasians, but it could be due to the methodology adopted for assessing this period; 3) not only were DRPE cases detected in the older age group, it was also found to be more common in patients developing the first acute episode at a later age, which was significant at 5%. This observation hints at an important factor for the development of DRPE and it needs further study; 4) the present study found DRPE to be more common in chronic type of CSC, whereas most of the Western studies found it to be more common in recurrent cases; 5) evolution of DRPE passes through a phase of RPE decompensation that might be reversible up to a certain critical period of time. This phenomenon is universal; 6) the present series clearly demonstrated the role of fairly large leaking PEDs in development of DRPE, unlike the small PEDs reported by Western authors; 7) CSC being basically an asymmetrically developed bilateral chronic disease, DRPE should be considered to be a rare variant of it, instead of considering it to be synonymous with chronic CSC.

Proprietary interest: None.

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