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Case Report

A STUDY OF WHITE WITHOUT PRESSURE PERIPHERAL RETINAL LESIONS IN EMMETROPIA AND MYOPIA

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ABSTRACT

This work was carried out in 240 eyes of 120 patients in order to study the white without pressure (WWOP) peripheral retinal lesions as regards to its incidence, morphology, distribution, associated retinal and vitreous changes predisposing to retinal detachment in 60 patients each of emmetropia and myopia. Maximum numbers of patients were in the second to fifth decade of life. The gender difference was not significant between the groups. The maximum numbers of eyes were emmetropic. The WWOP lesions were detected in 4.17% eyes. The WWOP lesions were found to be more common in the third decade of life. There was no predilection for sex in patients with WWOP. The WWOP lesions were found more frequently in myopic eyes as compared to emmetropic eyes. These lesions were observed between the oraserrata and equator. The isolated WWOP lesions were more frequent than the confluent lesions. The superotemporal quadrant was the most frequently involved. The peripheral retinal lesions capable of causing retinal detachment were seen more frequently in myopic eyes with WWOP. The peripheral retinal degenerations and vitreous changes were observed in all the eyes with WWOP irrespective of the type of refractive error. The WWOP lesion as such may not be having any potential for causing retinal detachment, but because of the more frequent association with the predisposing peripheral retinal degenerations and vitreous changes, it has been suggested that these eyes should be examined more exhaustively and followed up more frequently to prevent the occurrence of retinal detachment.

Key words: Chorioretinal atrophy, Goldman three-mirror lens, indirect ophthalmoscopy, peripheral retinal degenerations, posterior vitreous detachment, retinal break.

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INTRODUCTION

The term white without pressure (WWOP) refers to geographic areas of relative whiteness of the peripheral retina, which is seen by indirect ophthalmoscopy without scleral indentation. When the whitening of the retina appears over the scleral depressor the term used is white with pressure (WWP). The WWOP has been regarded by some as an exaggerated form of white with pressure (WWP) [1,2]. The subject of WWOP lesions is controversial as, there are only a few reports in the available literature as regards to its incidence, morphology, distribution and significance [3-9]. Moreover, the association of WWOP with subsequent retinal breaks/detachment is yet to be ascertained. A detailed study of these lesions was required in this regard.

Routine histopathological examination of these

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lesions in various sites is not possible. It is only the inspection of the retina, which gives us an insight into the significance, and natural history of these lesions. The advent of improvised binocular indirect ophthalmoscopy by Schepens in 1947 has lead to its development as a procedure of paramount importance in the stereoscopic examination of the periphery of the retina [10].

Various peripheral retinal lesions such as lattice degeneration, snail track degeneration, retinoschisis, and chorioretinal atrophy and vitreoretinal adhesions have been exhaustively studied by indirect ophthalmoscopy. Their incidence, morphology, associated vitreous changes like posterior vitreous detachment (PVD), vitreous liquefication and their predisposition to rhegmatogenous retinal detachment (RRD) have been established. This enables one to know the course of the disease and to devise various therapeutic and prophylactic measures to prevent occurrence of RRD. Though a lot of work has been carried out for these lesions, not much is known about the WWOP lesions.

The incidence of WOW lesions in emmetropic and myopic eyes needs to be established. The exact morphology, distribution and significance if known can give a meaning to their detection. The association of WWOP with vitreous changes such as PVD and vitreous liquefication also needs to be verified. This can be specifically looked into when a WWOP lesion is observed. Whether, WWOP lesions are a forerunner of a subsequent retinal detachment also needs to be ascertained. Such an association can be of great help in order to prevent retinal detachment once the exact course of the disease is established. Therefore, the WWOP lesions are still an enigma with the ophthalmologists.

For a better understanding of WWOP lesions a well-framed study of these lesions was required. This work is a step in this regard to find out the incidence, morphology, distribution and clinical significance of WWOP retinal lesions in emmetropic and myopic patients .

Material and methods

The present study was carried out in 120 patients attending the out patient department of an eye institute of ophthalmology in northern India. They were divided into two groups of 60 patients each. Group I consisted of patients of emmetropia, group II of myopia.

Patients suffering from diabetes, hypertension, haemoglobinopathies, Eales' disease, uveitis, glaucoma and patients of trauma were not included in the study. All the patients were subjected to history taking with special reference to the complaints of flashes of light, floaters, failing vision and defects in the field of vision. Subsequently, they were subjected to meticulous ocular examination consisting of slit lamp biomicroscopy of the anterior segment. Retinoscopy was carried out in all the patients, and best-corrected visual acuity (BCVA) and refractive error were recorded. Pupils were dilated by instilling a combination of phenylephrine (5%) and tropicamide (1%) eye drops three times at an interval of 10 minutes. Thereafter, the retina of the patients was examined by binocular indirect ophthalmoscopy and vitreous was examined by Goldman three-mirror contact lens biomicroscopy.

In the present study, the peripheral retina was examined, first, without scleral depression in order to detect specifically WWOP lesions. The morphology and distribution of WWOP lesions, presence/absence of peripheral retinal degenerations, capable of causing RRD, were recorded on a retinal chart. Subsequently, depressor indirect ophthalmoscopy was performed in order to record most peripheral retinal lesions, if any.

The vitreous examination was carried out by Goldman three-mirror contact lens biomicroscopy under topical anesthesia. The vitreous changes like synchisis, syneresis and PVD were looked for. Vitreoretinal traction, if any, in patients of white without pressure were recorded. The results of the study were compiled and entered into Google spread sheet and compared statistically to comment on the incidence, morphology and the distribution of WWOP lesions as well as associated retinal breaks and changes in the vitreous. Student's 't' test (two ended) was used to compare normally distributed numerical variables, the Fisher's exact test was done. Clinical data were expressed as mean ± standard deviation (SD) and percentage (%). The difference was considered significant when the p value was < 0.05.

RESULTS AND ANALYSIS

In the present study, a total of 120 patients were included and were divided into 2 groups of 60 patients each. Group I included emmetropes and group II of myopes.

The age of the patients ranged from 11-72 years, with maximum number of 94.17% patients in second to fifth decade of life. There were 53 (44.17%) males and 67 (55.83%)females in various age groups (Table 1).

In the present study 127 eyes (52.92%) including 7 eyes of myopic group had no refractive error. In the myopic group, 53 patients were having bilateral myopia whereas rest of the 7 patients was having unilateral myopia and accordingly 113 (47.08%) eyes in group II had refractive error. Maximum number of 25.0% eyes had 0.25-2 diopters of refractive error, and 12.09% eyes had refractive error of 2.25 – 6 diopters, and rest 9.58% eyes had > 6 diopters of refractive error (table 2).

In the present study the maximum number of 210 patients (87.5%) in the two groups had their best corrected visual acuity (BCVA) of 6/6 (table 3).

In the present study the WWOP lesions were seen in 8 (6.67%) patients, and these lesions were bilateral in 2 patients and unilateral in 6 patients. Thus, 10 eyes (4.17%) of 8 patients were having WWOP lesions. Therefore, the

incidence of WWOP lesions was found to be 4.17% in the present study. The incidence of WWOP lesions in emmetropes and myopes was found to be 0.65%, 2.70% respectively.

Out of 8 patients of WWOP, 5 were males and 3 were females. This predilection for sex in present study was statistically insignificant (p>0.05). The age of the patients of WWOP ranged from 18 years to 43 years and the maximum number of patients (75%) were seen in the third decade of life (table 4).

Out of 10 eyes having WWOP lesions, 2 eyes (20.0%) were emmetropic and 8 (80.0%) were myopic, thereby, signifying predilection of myopic eyes for WWOP lesions. This was found to be statistically significant (p <.001).

Seven eyes with myopia had refractive error > -2.25D, whereas, only 1 had refractive error < -2.25D. This means that myopes with refractive error > -2.25D were more frequently having WWOP lesions. This observation was statistically significant (p <.001) as shown in table 5.

Out of total 10 eyes of WWOP lesions, 60% eyes had BCVA of 6/6 and the rest were having BCVA < 6/6 (Table 6).

In the present study, two types of WWOP lesions were observed: Confluent and Isolated. The confluent lesions were circumferential to ora serrate involving more than one quadrant with sharp and well defined scalloped posterior border and fuzzy anterior border, and were found to be almost parallel to ora serrata. The isolated lesions were either tongue-shaped or finger-like with rounded and well-defined posterior border, which merged with the anterior retina imperceptibly and were confined to one quadrant only. The isolated lesions were observed more frequently than confluent lesions. The 7 out of 10 lesions (70.0%) of WWOP were of isolated type and 3 lesions (30.0%) were of confluent type (table 7).

The superotemporal quadrant was the most frequently involved (50%) and the inferonasal quadrant was the least frequently involved in this study. This difference in occurrence was found to be highly significant statistically as per Fisher's Exact Test.

It was found that in group I white without pressure lesions were associated coincidently with salt and pepper fundus in 2 eyes. In myopic group, these lesions were associated with 2 eyes each of lattice degeneration, pigmentary clumps, chorioretinal atrophy and retinal holes. Eight out of ten eyes (80%) with WWOP had associated retinal lesions. This association of WWOP in myopic eyes with various retinal lesions was found to be statistically significant (Z 4.23, p < .01) when compared with emmetropic eyes.

The most frequent retinal degeneration observed in the present study of 240 eyes was chorioretinal atrophy in 10 eyes (4.17%), and all the patients happened to be in myopic group. The incidence of chorioretinal atrophy increased to 8.85 % if myopic eyes (113) only were taken into consideration. Otherwise also, Group II had the maximum number of associated other retinal lesions (Table 10).

The incidence of peripheral retinal degenerations, like lattice degeneration, pigmentary clumps, chorioretinal atrophy and retinal breaks was 20.8% in myopic eyes, whereas the incidence was much more (75.0%) inmyopic eyes with WWOP. This higher incidence in myopic eyes with WWOP lesions was found to be statistically significant (Table 11).

In total 35% of eyes showed associated vitreous changes. Out of 120 eyes in group II, thirty-five eyes (29.2%) showed vitreous changes whereas, these were seen only in 5.8% eyes of group I. This difference was statistically significant.

All the patients with WWOP lesions, irrespective of type of refractive error, showed vitreous changes. However, these were observed more frequently in group II as compared to group I and were found to be statistically significant (p <0.001). The most common vitreous change observed was PVD in 70.0% eyes followed by vitreoretinal adhesions in 50% eyes and synchisis in 40% eyes as shown in Table 13.

Table 1. Age and Sex distribution in total patients of two groups

Sr. no.	Age (years)	Group I		Group II		no. of patients n
		Male	Female	Male	Female	
1	11-20	11	10	10	8	39
2	21-30	9	13	8	9	39
3	31-40	2	4	2	9	17
4	41-50	5	5	3	5	18
5	51-60	-	-	2	2	4
6	61-70	1	-	-	1	2
7	71-80	-	-	-	1	1
Total n (%)		28 (23.33)	32 (26.67)	25 (20.83	35 (29.17)	120 (100)

Table 2. **Distribution of refractive errors in group I and II**

Sr.No.	Refractive error (Diopters)	Group I (n=120)	Group II (n=120)	Total eyes n (%)

		RE	LE	RE	LE	
1.	No refractive error	60	60	4	3	127 (52.92)
2.	0.25-2	-	-	29	31	60 (25.0)
3	2.25-4	-	-	5	5	10 (4.17)
4	4.25-6	-	-	11	9	19 (7.92)
5	6.25-8	-	-	3	3	6(2.50)
6	>8	-	-	8	9	17 (7.08)
Total		60	60	60	60	240

Table 3. The BCVA in all eyes

Sr.No.	BCVA	Group I (n=120)		Group II (n=120)		Total eyes (n=240)	
		RE	LE	RE	LE	RE	LE
1	6/6	60	60	46	44	106	104
2	6/9- 6/12	-	-	4	5	10	11
3	6/18- 6/24	-	-	4	5	8	8
4	6/36- 6/60	-	-	4	1	4	1
5	< 6/60	-	-	2	5	2	5
Total		60	60	60	60	180	180

Table 4. The Distribution of age and sex in patients of white without Pressure (WWOP)

Sr.No.	Age(years)	Number of patients n		Number of eyes
		Male n	Female n	
1	11-20	1	-	2
2	21-30	3	3	6
3	31-40	1	-	2
4	41-50	-	-	-
Total		5	3	10 (100)

Table 5. The type and amount of refractive error in eyes with WWOP

Sr.No.	Amount of Refractive error (Diopters)	Group I (eyes=2) n	Group II (eyes=8) n	Total no. of eyes (n=10) n
1	0 - 2	2	1	3
2	2.25 - 4	-	2	2
3	4.25 - 6	-	2	2
4	6.25 - 8	-	1	1
5	> 8	-	2	2
Total (%)		2 (20.0)	8(80.0)	10(100)

Table 6. The **Distribution of BCVA in all 10 eyes of WWOP**

Sr.No.	(BCVA)	Group I		Group II		Total eyes n
		RE	LE	RE	LE	
1	6/6	1	1	3	1	6
2	6/9-6/12	-	-	-	-	-
3	6/18-6/24	-	-	1	1	2
4	6/36-6/60	-	-	-	-	-
5	<6/60	-	-	1	1	2
Total (%)		1	1	5	3	10 (100)

Table 7. The Distribution of type of WWOP lesions in the two groups

Sr. no	Type of lesions	Group I n	Group II n	Total n (%)
1	Isolated	1	6	7 (70.0)
2	Confluent	1	2	3 (30.0)
Total (%)		2(20.0)	8(80.0)	10 (100)

Table 8. The distribution of WWOP lesions in various quadrants

		Quadrant involved			
Sr. no.	Groups	Superonasal	Superotemporal	Inferonasal	Inferotemporal
1	I	1	1	-	-
2	II	2	4	-	2
Total (%)		3(30.0)	5 (50.0)	-(0)	2(20.0)

Table 9. Associated peripheral retinal lesions in the eyes with WWOP

Sr. no	Associated Retinal lesions	Group I (n=2)	Group II (n=8)
1	Lattice	-	2
2	Pigmentary clumps	-	2
3	Chorioretinal atrophy	-	2
4	Retinal holes	-	2
5	Salt and pepper fundus	2	-
Total (eyes)		2	8

Table 10. The distribution of various retinal degenerations in the two groups

Sr. no	Retinal degeneration	Group I(120 eyes) n	Group II (120 eyes) n	Total (240 eyes) n
1	Lattice degeneration	-	6	6
2	Pigmentary clumps	2	4	6
3	Chorioretinal atrophy	-	10	10
4	Retinal breaks	-	5	5
5	Salt and pepper fundus	2	-	2
Total(%)		4 (3.33)	25(20.83)	29(12.08)

Table 11. Associated peripheral retinal degenerations in myopic eyes with and without WWOP lesions– a comparative analysis

Sr. no	Retinal lesion	Myopic eyes(113 eyes) n (%)	Myopic eyes with WWOP(8 eyes) n (%)	Significance (Z value)
1	Lattice degeneration	6 (5.3)	2 (25)	6.9
2	Pigmentary clumps	4 (3.5)	1 (12.5)	9.5
3	Chorioretinal atrophy	10 (8.85)	2 (25)	2.8
4	Retinal breaks	5 (4.4)	1 (12.5)	8.1
Total (%)		25 (22.12)	6(75)	Z=4.23

Table 12. The vitreous changes in all the eyes in the two groups

Sr. no	Groups (eyes)	Synchysis/liquefication n (%)	PVD n(%)	Vitreoretinal adhesions n(%)	Total n(%)
1	I (120)	6(5.0)	1 (0.83)	-	7(5.8)
2	II (120)	14(11.7)	12(10.0)	9(7.5)	35(29.2)
Total	240	20(17.7)	13(10.83)	9(7.5)	42(35.0)

Table 13. The vitreous changes seen in 10 eyes of 8 patients of WWOP

Sr. no	Groups	Synchysis/cavitation eyes (%)	PVD eyes (%)	Vitreoretinal adhesions eyes (%)
1	I	2	1	-
2	II	2	6	5
Total (%)		4(40.0)	7(70.0)	5(50.0)

DISCUSSION

The term white without pressure (WWOP) refers to geographic areas of relative whiteness of the peripheral retina that can be seen by indirect ophthalmoscopy without scleral indentation. When the whitening of the retina appears over the scleral depressor the term used is white with pressure (WWP). The WWOP has been regarded by some as an exaggerated form of white with pressure [1,2]

The incidence of WWOP lesions, its exact morphology, distribution, associated retinal and vitreous changes and its significance to cause rhegmetogenous retinal detachment (RRD) can give a meaning to their detection. Whether, WWOP lesions are a forerunner of a subsequent retinal detachment also needs to be ascertained. Such an association can be of great help in order to prevent RRD, once the exact course of WWOP lesion is established.

In the present study, 240 eyes of 120 patients were studied for WWOP lesion as regards to its incidence, morphology, distribution, associated retinal and vitreous changes and their predisposition to retinal detachment. These included 60 patients each of emmctropia and myopia.

The WWOP lesions were detected in 10 eyes of 8 patients. The overall incidence of WWOP in the present study was 4.17%. The incidence in emmetropes and myopes was found to be 0.60%, 2.70% respectively. This was found to be in accordance with another study on Indian subjects which reported the incidence of to be 2.75% [7] However, it was found to be higher than the reported incidence of 0.6% in whites of New York [3] While reviewing the literature, we could find one study that was carried out in white and black races, in which the incidence of WWOP was 2.5% in the former and 23% in the latter [6] Thus, it was realised that the incidence of WWOP in Indians was almost the same as that observed in the Caucasians. The WWOP lesions were found to be more common in the third decade of life as 53.8% of the eyes having WWOP were found in this age group. This was in accordance with the other Indian study [7] However, the occurrence of WWOP lesions was more common in the fourth decade of life according to a study by Karlin and Curtin [5]

As regards to the gender, no statistically significant predilection was seen in the present study, which was in accordance with various authors who also observed sex to be an insignificant determinant in the prevalence of WWOP lesions [5,7,11]

In the present study of WWOP, lesions were found 80% in myopic eyes as compared to 20% in emmetropic eyes . This difference was highly significant statistically. The myopes having refractive error of more than 2.25 diopters were more commonly affected (80%). Similar observations were made by various authors [5,7] Karlin and Curtin reported the incidence to be 54% in myopes [5] Hunter noted the similar association and recommended yearly re-evaluation of WWOP lesions in patients with high myopia [6]

The best corrected visual acuity (BCVA) in 60% eyes with WWOP lesions was 6/6. This could be due to the relatively more peripheral location of the WWOP lesions without the involvement of the macula. However, the rest of the 40% eyes with less visual acuity happened to be high myopes with macular involvement.

In this study, the WWOP lesions were observed between the ora serrata and the equator. These lesions were either parallel to ora serrata with sharp scalloped posterior borders and fuzzy anterior borders. This finding was in accordance with the studies of other authors. (5,6) However, in the other study on Indian subjects, WWOP lesions were seen to affect the equatorial and post equatorial regions being separated from ora serrata by WWP lesions. [7] Though, the post equatorial distribution of these WWOP lesions was reported in rare instances by other authors [5,6,12], but it was not observed in the present study.

The isolated lesions of tongue shaped patches or circumferential girdle like lesions of WWOP were found more frequently (70.0%) than the confluent lesions (30.0%). This was in contrast to the observations of one study by Karlin and Curtin where confluent, lesions were found to be more than the isolated lesions [5]. Both the isolated and the confluent lesions were seen in another study. However, the prevalence was not mentioned [6].

In the present study, islands of normal retina surrounded by areas of WWOP resembling the pseudoholes were not observed. However, it had been reported by other authors [6,12]

In this study, bilateral WWOP lesions were observed in only 25% patients, and there was hardly any tendency of bilaterality. This was found to be in accordance with the other study on Indian subjects [7] However, Karlin and Curtin had reported a tendency of bilaterality in their study of 1437 eyes [5] This difference could be due to the large sample of exclusively myopic eyes.

Temporal retina was observed to be more frequently involved than the nasal retina in the present study, and it was in accordance with other studies [5-7]. In our observations, the most frequently involved quadrant was superotemporal and least frequent being inferonasal. This was statistically highly significant. However, it was found in other studies that inferotemporal followed by the superotemporal quadrant, seemed to be the most frequently involved retinal quadrants [5,6].

Various associated peripheral retinal degenerations capable of causing RRD, like lattice degenerations, pigmentary clumps, chorioretinal atrophy and atrophic retinal holes were most frequently (20.83%) observed in myopic eyes. And 75% of myopic eyes with WWOP had these lesions, and these were almost non-existent in emmetropes. The salt and pepper fundus lesion seen in only 1.67% of eyes was mere a coincidental finding and insignificant. This is an inflammatory condition and not a peripheral retinal degeneration.

The lattice degeneration was observed in 5.3% of myopic. However, the incidence increased to 25% in

myopic eyes of more than 6 diopters of refractive error. This was in accordance with observations of other authors, whose reported incidence of lattice degeneration in myopia of more than 6 diopters ranged from 11% to 22% [5,13,14]

In the present study out of 10 eyes of WWOP lesions 8 eyes were myopic and the association of various peripheral retinal lesions was observed in 75.0% of these myopic eyes. The associated lattice degeneration in eyes with WWOP was observed in 25% eyes as compared to 5.3% in myopic group. This difference was found to be statistically highly significant. Though, the other authors had also reported the association of lattice degeneration with WWOP but, the exact percentage was not mentioned.(5,6) However, it was obvious from the present study that the lattice degeneration, a predisposing factor for retinal detachment was found more frequently in myopic patients with WWOP than in myopic patients in general.

The pigmentary clumps are known to occur at sites of vitreoretinal adhesions. These were observed in 3.5% of myopes compared to 1.7% in the emmetropes.. The incidence of pigmentary clumps was found to be much less than what had been reported by others [5] This appeared to be because of the fact that all the patients with pigmentary clumps were in the younger age group of less than 30 years of age. Karlin and Curtin had also observe this who reported a lower incidence in patients of less than 20 years of age [5] In this study, the association of pigmentary clumps with WWOP were seen in 18.5% of myopic eyes as compared to 3.5% eyes without WWOP lesions. This difference was found to be statistically significant. Since, the presence of pigmentary clumps is an established lesion predisposing to RRD. Therefore, it appeared that the presence of these lesions with WWOP makes the eye more vulnerable to develop RRD.

In the present study chorioretinal atrophy was observed in 8.85% myopic eyes and the incidence increased to 25% in myopes of refractive error of more than 6 diopters. This was found to be in accordance with other studies where an incidence of 22.4% of chorioretinal atrophy was found in myopic subjects in one study [9], and 23% in another study [15]. The association of chorioretinal atrophies with WWOP were observed in 25% of myopic eyes as compared to 8.85 % eyes in myopes without WWOP lesions. This difference was found to be statistically highly significant.

In the present study the retinal breaks were found in 4.4% of myopic eyes but, none of the eyes in emmetropics. If, myopic eyes of more than 6 diopters were taken into consideration the incidence of retinal breaks increased to 13%. This was found to be in accordance with Karlin and Curtin and Hyams and Newmann who also found the occurrence of retinal breaks in high myopes [16,17]. The retinal breaks were observed in 12.50% with WWOP lesions as compared to 4.4% in myopic group in general. And this difference was found to be statistically highly significant.

In the present study, the vitreous changes consisting of liquefication, PVD and vitreoretinal adhesions were seen to occur more frequently (29.2%) in myopes as compared to emmetropes (5.8%). This difference was statistically highly significant. The degenerative changes in vitreous gel were seen in lesser percentage of cases in emmetropic group as compared to the reported incidence of other authors. (18,20-22) This appeared to be because of the fact that the patients were relatively of younger age in both these groups (40-50 years) as compared to the samples of other authors. However, these changes were observed in relatively still younger patients in group II of myopia. This was in accordance with other authors [18-21]. Vitreous liquefication was observed in 11.7%) eyes, PVD in 10.0% and vitreoretinal adhesions in 7.5% eyes of myopes. This was in accordance with other studies by Singh et al (18) and Takahashi et al. [19]

Most common vitreous lesion observed was PVD (60%) in association with vitreoretinal adhesions (50%) posterior to vitreous base and vitreous liquefication (20%) in myopic eyes with WWOP lesions. These were observed in areas corresponding to the WWOP as confirmed by Goldman three mirror examination and were found to be in accordance with other studies [1,4,5,7,11,12,22].

In the majority of the eyes with WWOP lesions PVD and vitreoretinal adhesions were observed, therefore, it could be postulated that the later caused some kind of traction on the retina making it appear greyish white than the adjoining adhesion-free normal looking retina. Thus, the WWOP lesions in association with PVD and vitreoretinal adhesions posterior to vitreous base were found to be in accordance with other reports [4,6,12,16].

Some authors considered WWOP just an abnormal light reflex originating at the vitreoretinal interface without structural abnormalities [1]. Other evidence suggesting this include the observations that these areas migrate and/or disappear [4] and are far more frequent in young patients [5,7] In the present study we did not observe any abnormal light reflexes, which further gives support to the hypothesis that WWOP lesions are probably as a result of vitreoretinal adhesions only in the areas of WWOP following the synchisis and syneresis of vitreous.

On the basis of the frequent presence of PVD and vitreoretinal adhesions visualized in the area corresponding to WWOP, it was postulated that vitreoretinal traction at the base of the vitreous was probably responsible for the occurrence of WWOP.

Since, WWOP lesions were found significantly

more frequently in myopic eyes as compared to non-myopic eyes and the associations of peripheral retinal lesions predisposing to retinal detachment were also observed significantly more commonly in myopic eyes with WWOP than in the myopic eyes without WWOP lesions. Therefore the eyes with WWOP lesion should not be disposed off after establishing the presence of WWOP lesion. Infact, a suspicion should arise warranting more close and frequent follow-up for the timely detection and treatment of predisposing lesions causing RRD in such eyes so that the potential to cause retinal detachment is warded off.

CONCLUSION

The present study was carried out in 240 eyes of 120 patients in order to study the peripheral retinal lesion-WWOP, as regards to its incidence, morphology, distribution, associated vitreous changes and its predisposition to retinal detachment in 60 each of emmetropic and myopic patients and compare the two groups. The age of the patients ranged from 11 to 72 years, with maximum number of patients in second to fifth decade of life. The gender was not found to be significantly different between the groups. And the maximum number of eyes was emmetropic. The WWOP lesions were detected in 4.17% eyes. The WWOP lesions were found to be more common in the third decade of life. There was no predilection for sex in patients with WWOP lesions. The WWOP lesions were found more frequently in myopic eyes as compared to emmetropic eyes. These lesions were observed between the oraserrata and equator. The isolated WWOP lesions were more frequent than the confluent lesions. The WWOP lesions were mostly unilateral. The superotemporal quadrant of the retina was most frequently involved. The association of other peripheral retinal degenerations like lattice degeneration, chorioretinal atrophy, pigmentary clumps, and retinal breaks was found only in myopic group. The various vitreous changes like PVD, liquefication and vitreoretinal adhesions were observed more frequently in myopes as compared to emmetropes. The vitreous changes were observed in majority of the eyes with WWOP irrespective of the type of refractive error. The WWOP lesion as such may not be having any potential for causing retinal detachment, but because of the more frequent association of the above to the predisposing peripheral retinal degenerations and vitreous changes, it has been suggested that these eyes should be examined more exhaustively and followed up more frequently to prevent the occurrence of retinal detachment.

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Nil

CONFLICT OF INTREST

No interest.

REFERENCES

1. Tolentino FI, Schepens CL, Freeman HM. (1976). Vitroretinal disorders-Diagnosis and Management. Philadelphia: WB Saunders, 328
2. Curtin BJ. (1985). The Myopias: Basic Science and Clinical Management. New York: Harper and ROW, 339-403.
3. Halpern JI. (1966). Routine screening of the retinal periphery. *Am J Ophthalmol*, 62, 99-102
4. Nagpal KC, Huamonte F, Constantaros A. (1976). Migratory whitewithout pressure retinal lesions. *Arch Ophthalmol*, 94, 576-579.
5. Karlin DB, Curtin BJ. (1976). Peripheral chorioretinal lesions and axiallength of the myopic eye. *Am J Ophthalmol*, 81, 625-635.
6. Hunter JE. (1982). Retinal white without pressure: Review and relative incidence. *Am J Optom Physiol Opt*, 59, 293-296.
7. Shukla M, Ahuja OP. (1982). White with pressure (WWP) and whitewithout pressure (WWOP) lesions. *Ind J Ophthalmol*, 30, 129-132.
8. Augsburger JJ. (1988). Peripheral retinal degenerations. In: David A. Newsome, editor. Retinal dystrophies and degenerations. NewYork: Raven Press, 302.
9. Shukla M, Ahuja OP. (1983). Peripheral retinal in myopia. *Ind J Ophthalmol*, 31, 719- 722
10. Schepens CL. (1947). A new ophthalmoscope demonstration. *Trans Am Acad Ophthalmol Otolaryngol*, 51, 298-305.
11. Rutnin U, Schepens CL. (1967). Fundus appearance in normal eyes. Retinal breaks and other findings. *Am J Ophthalmol*, 64, 1063-1077
12. Bell FC, Stenstrom WJ. (1983). Peripheral retinal appearances and degenerations. In: Atlas of the peripheral retina. Philadelphia, WB Saunders, 24.
13. Schepens CL, Bahn GC. (1950). Examination of the ora serrata its importance in retinal detachment. *Arch Ophthalmol*, 44, 677-690.
14. Kirker GEM, McDonald DJ. (1971). Peripheral retinal degeneration in high myopia. *Can J Ophthalmol*, 6, 58.
15. Curtin BJ. (1985). The Myopias. Basic Science and Clinical management. New York: Harper and Row, 183.
16. Karlin DB, Curtin BJ. (1974). Axial length measurements and peripheralfundus changes in the myopic eye. In: Pruett RC and Regan CDJ, editors. Retina congress. New York: Appleton - Century – Crofts, 629.

17. Hyams SW, Neumann E. (1969). Peripheral retina in myopia: with particular reference to retinal breaks. *Br J Ophthalmol*, 53, 300-306.
18. Singh A, Paul SD, Singh K. (1970). The clinical study of the vitreous body (in emmetropia and refractive errors). *Orient Arch Ophthalmol*, 8, 11.
19. Takahashi M, Jalkh A, Hoskins J, Trempe CL and Schepens CL. (1981). Biomicroscopic evaluation and photography of liquefied vitreous in some vitreoretinal disorders. *Arch Ophthalmol*, 99, 1555-1559
20. Teng CC, Chi HH. (1957). Vitreous changes and the mechanism of retinal detachment. *Am J Ophthalmol*, 44, 335.
21. Goldman H. (1961).The diagnostic value of biomicroscopy of the posterior parts of the eye. *Br J Ophthalmol*, 45, 449-60.
22. Gloor BP, Daicker BC. (1975). Pathology of the vitreoretinal border structures. *Trans Ophthal Soc UK*, 95: 387.

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