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Case Report

ANALYSIS OF WHITE WITHOUT PRESSURE RETINAL LESIONS IN MYOPIA AND HYPERMETROPIA

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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) lesions as regards to its incidence, morphology, distribution, associated retinal and vitreous changes predisposing to retinal detachment in 60 patients each of myopia and hypermetropia. The maximum numbers of patients were in the second to fifth decade of life. There were 36.67% males and 63.33% females. The maximum number of eyes had 0-2 diopters of refractive error. The WWOP lesions were detected in 4.58% eyes. The WWOP lesions were found to be more common in the third decade of life. There was no predilection for sex in the patients with WWOP. The WWOP lesions were found more frequently in myopic eyes as compared to hpermetropic eyes. These lesions were observed between the ora serrata 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 associated 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 to the predisposing peripheral retinal degenerations and retinal breaks, 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, lattice degenerations, posterior vitreous detachment, retinal break, vitreous liquefictaion.

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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 and detachment is yet to be ascertained. A detailed study of these lesions was required in this regard.

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Routine histopathological examination of these 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 binocular indirect ophthalmoscopy by Schepens in 1947 has lead to its development as a procedure of paramount importance in the stereoscopic examination of the peripheral retina [10].

Various peripheral retinal lesions such as lattice degeneration, snail track degeneration, retinoschisis, and chorioretinal atrophy 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..

The exact incidence, morphology, distribution and significance of WWOP to cause RRD in myopic and hypermetropic eyes, if known, can give a meaning to their detection. The association of WWOP with other peripheral retinal and vitreous changes needs to be verified. This can be specifically looked into when a WWOP lesion is observed. Whether WWOP lesion is a forerunner of a subsequent retinal detachment also needs to be ascertained. This knowledge can be of great help in order to prevent retinal detachment once the exact course of the disease is established.

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 myopic and hypermetropic 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 of myopia and hypermetropia.

Patients suffering from diabetes, hypertension, Eales' disease, uveitis, glaucoma and trauma were excluded from the study. A detailed history was taken in all the patients with special reference to the complaints of flashes of light, floaters, failing vision and defects in the field of vision. Then, a meticulous ocular examination consisting of retinoscopy and slit lamp biomicroscopy of the anterior segment was carried out. The amount and type of refractive error and best-corrected visual acuity (BCVA) were recorded. Pupils were dilated by instilling a combination of phenylephrine (5%) and tropicamide (1%) eye drops. Thereafter, the retina of the patients was examined by binocular indirect ophthalmoscopy and the vitreous was examined by Goldman three-mirror contact lens biomicroscopy.

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

Vitreous examination was carried out by Goldman three-mirror contact lens biomicroscopy under topical anesthesia. The vitreous changes like synchisis, syneresis, PVD and vitreoretinal adhesions, if any, were looked for, particularly in patients of white without pressure. The results of the study were compiled and analyzed 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) and Fisher's exact test were used to find statistical significance. Clinical data was expressed as mean±SD (standard deviation of the mean) 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 of myopia and hypermetropia.

The age of the patients ranged from 11-72 years, with maximum number of patients (88.33%) in second to fifth decade of life. There were 44 (36.67%) males and 76 (63.33%) females in various age groups as depicted in Table 1. This difference between the two groups was statistically significant.

In the myopic group, 53 patients were having bilateral myopia whereas rest of

the 7 patients were having unilateral myopia and accordingly, 113 eyes had refractive error. In hpermetropic group, 55 patients were having bilateral hypermetropia and 5 patients had unilateral hypermetropia and accordingly, 115 eyes had refractive error. Thus, in the present study there were 228 (95%) eyes with refractive error. Maximum number of 64.5% eyes were having 0-2 diopters of refractive error, and 25% eyes had refractive error of 2.25 – 6 diopters, and rest 10.5% eyes had > 6 diopters of refractive error (table 2).

In the present study the maximum number of patients (86.4%) in the 2 groups had best corrected visual acuity (BCVA) of 6/6 (table 3).

In the present study the WWOP lesions were seen in 10 (8.33%) patients, and these lesions were bilateral in 1 patient and unilateral in 9 patients. Thus, 11 eyes (4.58%) were having WWOP lesions. Therefore, the incidence of WWOP lesion was found to be 4.58% in the present study. The incidence of WWOP lesion in myopes was 4.17% and in hypermetropes 0.41%.

Out of 10 patients of WWOP, 6 were males and 4 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 (60%) were seen in the third decade of life (table 4).

Out of 10 patients having WWOP lesions, 9 (90 %) were myopic and 1 eye (10.0%) was hypermetropic, 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 2 had refractive error < -2.25D. This means that myopes with refractive error > -2.25D were more frequently having WWOP lesions. This observation was statistically highly significant (p <.001) as shown in table 5.

Out of total 11 eyes with WWOP lesions, 63.64% eyes had BCVA of 6/6 and the rest were having BCVA < 6/9 (Table 6).

In the present study two types of WWOP lesions were observed: Confluent and Isolated. The isolated lesions were observed more frequently than confluent lesions. Eight out of 11 lesions (72.72%) of WWOP were isolated type of lesions and 3 lesions (27.77%) were of confluent type (table 7).

The most (45.45%) was the most and inferonasal the least (9.1%) frequently involved quadrant in this study. This difference in occurrence was found to be highly significant statistically as per Fisher's Exact Test.

In group I, the associated peripheral retinal degenerations were found in 2 eyes each of lattice degeneration, pigmentary clumps, chorioretinal atrophy and retinal holes. Whereas, in Group II no associated retinal lesions were observed (Table 9).

Eight out of ten myopic 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 hypermetropic eyes.

The most frequent retinal degeneration observed in the present study of 240 eyes was chorioretinal atrophy in 13 eyes (3.61%), and all the patients happened to be in myopic group (group II). The incidence of chorioretinal atrophy increased to 11.5 % if myopic eyes only were taken into consideration. Otherwise also, Group II had the maximum number of associated other retinal lesions, whereas, group II was without any associated retinal lesion (Table 10).

The incidence of peripheral retinal degenerations like lattice degeneration, pigmentary clumps, chorioretinal atrophy and retinal breaks was 5.0%, 3.3%, 10.8% and 4.2% respectively in myopic eyes of group I, whereas the incidence was 20% of each of the above lesions in myopic eyes with WWOP. The higher incidence of these lesions in myopic eyes with WWOP as compared to myopic eyes of group I was found to be statistically significant (Table 11).

Out of 120 eyes in group I, thirty-five eyes (29.2%) showed vitreous changes whereas, 4 eyes (3.4%) of group II showed vitreous changes. This difference was statistically highly significant (p < 0.001).

All the patients with WWOP lesions, irrespective of type of refractive error, showed vitreous changes. However, these were observed more frequently in group I as compared to group II and these were found to be statistically highly significant (p <0.001). The most common vitreous change observed was PVD in 80.82%% eyes.

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

Sr.No.	Age(years)	Group I (n=60)		Group II (n =60)		Total no. of patients n (%)
		Male	Female	Male	Female	
1	11-20	10	8	8	5	31(25.83)
2	21-30	8	9	4	13	34(28.33)
3	31-40	2	9	1	12	24(20.0)
4	41-50	3	5	3	6	17 (14.17)
5	51-60	2	2	2	4	10 (8.33)
6	61-70	-	1	1	1	3(2.50)
7	71-80	-	1	-	-	1 (0.83)

Table 2. The distribution of refractive error in total eyes

Sr. No.	Refractive Error (Diopters)	Group I (n=113)		Group II (n=115)		Total eyes n (%)
		RE	LE	RE	LE	
1	0-2	29	31	42	45	147(64.5)
2	2.25- 4	5	5	11	12	33(14.5)
3	4.25- 6	11	9	4	-	24(10.5)
4	6.25 -8	3	3	-	1	7(3.1)
5	>8	8	9	-	-	17(7.5)
Total		56	57	57	58	228(100)

Table 3. The Best Corrected Visual Acuity (BCVA) in total 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	46	44	50	51	156	155
2	6/9- 6/12	4	5	6	6	10	11
3	6/18- 6/24	4	5	4	3	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 WWOP

Sr.No.	Age(years)	Number of patients n		Number of eyes n (%)
		Male n	Female n	
1	11-20	1	-	1 (10)
2	21-30	3	3	6 (60)
3	31-40	1	-	1 (10)
4	41-50	1	1	2 (20)
Totaln (%)		6(60	4(40)	10 (100)

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

Sr.No.	Amount of Refractive error	Group I n (%)	Group II n (%)	Total no. of eyes n (%)
1	0 - 2	2	1	3 (27.27)
2	2.25 - 4	3	-	3 (27.27)
3	4.25 - 6	2	-	3 (27.27)
4	6.25 - 8	1	-	1 (9.09)
5	> 8	1	-	1 (9.09)
Total		9 (90)	1 (9.0)	11 (100)

Table 6. The distribution of BCVA in all 11 eyes of WWOP

Sr.No.	Visual acuity (BCVA)	Group I		Group II		Total eyes n (%)
		RE	LE	RE	LE	
1	6/6	5	1	-	1	7 (63.64)
2	6/9-6/12	-	-	-	-	-
3	6/18-6/24	1	1	-	-	2(18.18)
4	6/36-6/60	-	-	-	-	-
5	<6/60	1	1	-	-	2(18.18)
Total eyes(%)						11(100)

Table 7. The distribution of type of WWOP lesions in all groups

Sr. no	Type of WWOP lesions	Group I n	Group II n	Total no. of lesions n (%)
1	Isolated	7	1	8(72.72)
2	Confluent	3	-	3(27.27)
Total		10(90.9)	1(9.1)	11(100)

Table 8. The distribution of WWOP lesions in various quadrants

		Quadrant involved			
Sr. no.	Groups	Superonasal	Superotemporal	Inferonasal	Inferotemporal
1	I	2	5	1	2
2	II	-	-	-	1
Total lesions(%)		2(18.18)	5 (45.45)	1 (9.1)	3(27.27)

Table 9. Showing other peripheral retinal lesions in the eyes with WWOP

Sr. no	Associated lesions	Group I (n=10)	Group II (n=1)
1	Lattice degenerations	2	-
2	Pigmentary clumps	2	-
3	Chorioretinal atrophy	2	-
4	Retinal holes	2	-
Total(eyes)		8 (80%)	-

Table 10. The distribution of 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 degenerations	6 (5.0)	-	6 (2.5)
2	Pigmentary clumps	4 (3.3)	-	4 (1.7)
3	Chorioretinal atrophy	13 (10.8)	-	13 (5.42)
4	Retinal breaks	5 (4.2)	-	5 (2.08)
Total (%)		28 (24.8)	-	28(11.67)

Table 11. Associated peripheral retinal degenerations in myopic eyes – a comparative analysis

Sr. no	Retinal lesion	Myopic eyes (113 eyes) n (%)	Myopic eyes with WWOP (10 eyes) n (%)	Significance (Z value)
1	Lattice degeneration	6 (5.3)	2 (20)	6.9
2	Pigmentary clumps	4 (3.5)	2 (20)	9.5
3	Chorioretinal atrophy	13 (11.5)	2 (20)	2.8
4	Retinal breaks	5 (4.4)	2 (20)	8.1
Total (%)		28 (24.8)	8 (80)	Z=4.23

Table 12. **The vitreous changes in all the patients.**

Sr. no	Groups (eyes)	Synchysis/Liquefication n (%)	PVD n(%)	Vitreoretinal adhesions n(%)	Total n(%)
1	I (120)	14 (11.7)	12 (10.0)	9 (7.5)	35 (29.2)
2	II (120)	2 (1.7)	2 (1.7)	-	4 (3.4)

Table 13. The vitreous changes seen in 11 eyes of 10 patients of WWOP

Sr. no	Groups (eyes)	Synchysis/cavitation eyes	PVD eyes	Vitreoretinal adhesions eyes
1	I (10)	2	8	6
2	II (1)	1	1	-
Total (%)		3 (27.27)	9 (80.82)	6 (54.55)

Discussion

The term 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 myopia and 60 patients of hypermetropia

The WWOP lesions were detected in 11 eyes of 10 patients. The overall incidence of WWOP in present study was 4.58%. The incidence in myopes and hypermetropes was found to be 4.17% and 0.41% 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. (6) The incidence of WWOP was 2.5% in the former and 23% in the latter. Thus, it was noted 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 60% patients were found to be 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 sex 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 more commonly in myopic eyes (90%) as compared to hypermetropiceyes (10%). This difference was highly significant statistically. No study has compared this between myopic and hypermetropic eyes.

The myopes having refractive error of more than 2.25 diopters were more commonly affected (63.63%). Similar observations were made by some other authors [5,7]. Karlin and Curtin reported the incidence to be 54% in myopes [5] and Hunter noted the similar association and recommended yearly re-evaluation of WWOP lesions in patients with high myopia [6]

Out of total 11 eyes with WWOP lesions, 63.64% eyes had BCVA of 6/6 and the rest were having BCVA < 6/9. This could be due to the relatively more peripheral occurrence of the WWOP lesions without the involvement of the macula. However, the rest of the 2 eyes with less visual acuity were of high myopia with macular involvement.

In the present study, the WWOP lesions were observed between the ora serrata and the equator. 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 white with pressure 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.

In this study, the isolated lesions of tongue shaped patches or circumferential girdle like lesions of WWOP were found to be more common (72.72%) than confluent lesions (27.77%), and this difference was found to be statistically highly significant. This was in contrast to the observations of one study where confluent lesions were found to be more common 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 10% patients. There was hardly any tendency of bilaterality of the lesions. This was found to be in accordance with the other study on Indian subjects. [7] However, Karlin and Curtin reported a tendency of bilaterality in WWOP lesions in their study of 1437 eyes. (5) This difference could be due to the large sample of 1437 eyes exclusively of myopia as compared to smaller sample of 360 eyes consisting of 120 myopic eyes in the present study.

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]. The most frequently involved quadrant having WWOP was superotemporal (45.45%) and least frequent being inferonasal (9.1%).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].

The incidence of peripheral retinal degenerations like lattice degeneration, pigmentary clumps, chorioretinal atrophy and retinalbreaks was 5.0%, 3.3%, 10.8% and 4.2% respectively in myopic eyes. The total incidence of these various peripheral retinal degenerations was 24.8% in mypic eyes. And 80% of myopic eyes with WWOP had these associated peripheral retinal degenerations. In the present study there was not even a single patient in groupof hypermetropes who was having associated peripheral retinal degenerations.

The lattice degeneration was observed in 5.0% of myopic patients. However, the incidence increased to 26% 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].

The associated lattice degeneration in myopic eyes with WWOP was observed in 20% as compared to 5.3% in myopic eyes without WWOP. 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 had not been 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 3.3 % of myopic patients and none in hypermetropic patients. 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 observed this, who reported a lower incidence in patients of less than 20 years of age [5].

In this study the associations of pigmentary clumps in myopic eyes with WWOP were seen in 20% as compared to 3.5% eyes in myopic eyes without WWOP. This difference was found to be statistically significant. Since, the presence of pigmentary clumps is an established risk factor predisposing to RRD. Therefore, it appears that the association of these lesions with WWOP makes the eye more vulnerable to develop RRD.

In the present study chorioretinal atrophy was observed in 10.8% myopic patients, and the incidence increased to 30.4% 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 20% myopic eyes as compared to 10.8 % eyes in myopic group. This difference was found to be statistically highly significant.

In the present study the retinal breaks were found in 4.2% of myopic patients and none in hypermetropes. 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, Hyams and Newmann who also found the similar prevalence of retinal breaks in high myopes. (16,17)

The retinal breaks were observed in 20% of myopic eyes with WWOP lesions as compared to 4.2% in myopes without WWOP. The atrophic holes were found more frequently in myopic eyes with WWOP and the difference was found to be statistically highly significant.

In the present study the vitreous changes consisting of liquefaction, PVD and vitreoretinal adhesions were seen to occur more frequently (29.2%) in myopes as compared to 3.4% in hypermetropes. This difference was statistically highly significant. Vitreous liquefaction was observed in 11.7 % eyes, PVD in 10% eyes and vitreoretinal adhesions in 7.5% myopic eyes. This was in accordance with other studies by Singh et al. (18) and Takahashi et al. [19]

The degenerative changes in vitreous gel were seen in lesser percentage of cases in in hypermetropic patients as compared to the reported incidence by other authors. [18,20-22]. This appeared to be because of the fact that the patients were relatively of younger age in hypermetropes as compared to the samples of other authors. However, these changes were observed in relatively still younger patients in myopes in our study. This was in accordance with other authors [18,20-21].

The most common vitreous changes observed were PVD (80.82%) in association with vitreoretinal adhesions (54.55%) posterior to vitreous base and vitreous and liquefication in 27.27% eyes. 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, WWOP lesions in association with PVD and vitreoretinal adhesions posterior to vitreous base had been found to be in accordance with other reports [4,6,12,16].

Some authors considered white without pressure just an abnormal light reflex originating at the vitreoretinal interface without structural abnormalities [1]. Other evidence suggesting that white without pressure was only due to an abnormal light reflex 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 visualised 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 was 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 should not be disposed off after establishing the presence of WWOP lesions. Infact, a suspicion should arise warranting more close and frequent follow-up for the timely detection and treatment of predisposing lesions 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 peripheral retinal and vitreous changes and its predisposition to cause retinal detachment. These cases were divided into two groups of 60 patients each of myopia and hypermetropia. The age of the patients ranged from 11 to 72 years with maximum number of patients in second to fifth decade of life. There were 40%

males and 60% females. The maximum numbers of eyes were having 0-2 diopters of refractive error .The maximum number of patients in all age groups had their best corrected visual acuity of 6/6. The WWOP lesions were detected in 10 eyes. The overall incidence of WWOP lesions was found to be 4.58%. There was no predilection for sex in patients with WWOP in the present study. The WWOP lesions were found to be more common in the third decade of life. The WWOP lesions were found more frequently in myopic eyes (90%) as compared to hypermetropes (10%). Eighty percent of these myopes had refractive error of more than -2.25 diopters. The WWOP lesions did not affect the visual acuity of the patients. The WWOP lesions were observed between the oraserrata and equator. The isolated WWOP lesions were more frequent (90.9%) than the confluent (9.01%). It was bilateral lesions in only 1 patient. Superotemporal quadrant of the retina was the most frequently involved and the least frequent being the inferonasal quadrant. The association of other peripheral retinal degenerations like lattice degeneration, pigmentary clumps, chorioretinal atrophy and retinal breaks were found only in myopic group. Associated peripheral retinal degenerations were observed in 24.8% of myopic eyes as a whole whereas these were seen in 80% myopic eyes with WWOP lesions. Vitreous changes like PVD, liquefication and vitreoretinal adhesions were observed more frequently in myopes (29.2%) as compared to hypermetropes (3.4%). Although, the vitreous changes were observed in majority of the eyes with WWOP irrespective of the types of refractive error but these occurred significantly more frequently in myopes than hypermetropes. Since the occurrence of PVD and vitreoretinal adhesions could be visualized in areas corresponding to WWOP lesions, therefore, it could be postulated that the latter caused some kind of traction on the retina making it appear greyish-white than the adjoining adhesion free normal retina. The WWOP lesion as such may not be having any potential for causing retinal detachment, but because of its more frequent association with predisposing peripheral retinal degenerations, retinal breaks and vitreous changes, it had been advocated that these eyes should be examined more exhaustively and followed up more frequently for the development of any retinal detachment.

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CONFLICT OF INTREST

No interest.

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