Case Report

Multiple evanescent white dot syndrome: case presentation and literature review

Abstract

The multiple evanescent white dot syndrome is a multifocal ocular condition involving the choroid and the retina that typically affects young myopic females. It is typically unilateral and has a favorable evolution without treatment, recovering the visual function and normal structure upon several weeks since the onset of the condition. In some cases, treatment via systemic corticosteroids has been chosen, as in the case of the patient selected for the present work, in which an excellent visual and structural result was obtained much faster by using the treatment with corticosteriods. The present article presents a literature review on the current issues about this pathology and the possibilities with regard to its management.

Keywords: MEWDS, visual acuity, corticosteroids, outer retina, choroids

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Abbreviations: MEWDS, multiple evanescent white dot syndrome; FA, fluorescein angiography; RPE, retinal pigment epithelium; SD-OCT, spectral domain optical coherence tomography; OCT, optical coherence tomography; ICGA, indocyanine green angiography; CVC, computerized visual field; VA, visual acuity; ERG, electroretinogram; HIV, human immunodeficiency virus; HSV, herpes simplex virus; CMV, cytomegalovirus; TB, tuberculosis

Introduction

The multiple evanescent white dot syndrome (MEWDS) is a multifocal condition involving the choroid and the retina, typically unilateral with spontaneous resolution of fundus findings upon several weeks of evolution without any visual or structural alterations.[1-3] Reported for the first time by Jampol in 1984,[1] affects females principally (75% of cases) between 20 and 50 years of age. A high association with myopia has been found.[2,4] Less frequently, it is recognized that the MEWDS can be associated with recurrences, bilateralism and inflammatory changes of the choroid and the retina which are known as the atypical forms of the disease.[3] In recent years, the possibility of two presentations has been considered, the classic known as primary and the secondary that could be associated with those forms described as atypical presentations.

The etiology and pathophysiology of this disease are not yet clear, but throughout the years since its initial description, debut cases of this pathology have been reported following a viral infection or vaccination. Moreover, the high levels of IgG and IgM found in the patients' serum who have the active disease and symptoms similar to those of a viral infection associated to MEWDS have sometimes backed up the theory of an infection as the trigger of this syndrome.[1,4]

The patients usually exhibit acute onset of unilateral painless blurred vision that can be associated or not to the presence of floaters or scotomas, in addition to physiological blind spot enlargement.[1,4] Its presentation usually exhibits multiple unilateral grey-white nummular dots in the ocular fundus (outer retina and choroid), located principally in the macular region, but can extend into the medium outer area, with foveal granularity or optic disc edema at the acute phase.[5] A less typical presentation may also exhibit vitritis and an inflammatory response in the anterior segment.

The findings of initial studies using fluorescein angiography (FA) and electrophysiology, suggested that the MEWDS was a disease that affected the retinal pigment epithellium (RPE) or the outer retina, while recent studies using spectral domain optical coherence tomography (SD-OCT) suggested that it could be a disease of the outer retina caused by the presence of hyper-reflective material in the outer retina and alterations of the ellipsoid zone, without evidence of RPE damage. Finally, studies using indocyanine green angiography (ICGA) and measurements of the choroidal thickness in patients with and without the disease concluded that MEWDS can be a choroidal inflammatory disease.[2]

Spontaneous resolution usually occurs within 7 to 10 weeks without treatment, although some cases have reported much faster resolution through medical management using systemic corticosteroids both intravenous and oral, reporting recovery of the visual acuity and changes that are evident in the OCT within 3 days, 1 week, and 3 weeks, respectively.

The present article presents the case of a patient diagnosed with MEWDS, exhibiting a typical clinical development managed with intravenous pulse dosing corticoesteroid therapy. The clinical evolution of the disease is described and a literature review on MEWDS and its current management is made.

Case presentation

18 year old female patient coming from a rural area without important antecedents, admitted due to one-week clinical symptoms consisting on progressive reduction of the visual acuity in the left eye not associated to other ocular symptoms. Upon admission, 20/20 visual acuity in right eye and 20/400 in left eye were documented, Ishihara test normal for both eyes, external examination, extraocular movements and pupillary reflex without alterations, healthy anterior segment in both eyes and intraocular pressure within normal limits. No alterations were found at the the ocular fundus of the right eye under pharmacologic dilation, the left eye presented optic disc exhibiting diffuse elevated margins with multiple rounded pointed whitish scattered lesions over the macular area with foveal compromise. No further lesions were observed in the medium outer area or the rest of the retina.

The two diagnoses considered were white dot syndrome and neuroretinitis of infectious causes; for this reason, infectious profile, fluorescein angiography, computerized visual field (CVC), and macular OCT were requested. The patient had normal blood count and acute phase reactants, negative infectious profiles (HIV, syphilis, toxoplasma, HSV, CMV, TB) and an abdominal echography and a chest radiography without alterations.

Blind spot enlargement in CVC was documented in the left eye with associated central defect (figure 1). The macular OCT showed vitreous opacities, overall increase in thicknesses, and the presence of subretinal hyper-reflective material with an interrupted ellipsoid zone and external limiting membrane (figure 3). The fluorescein angiography exhibited edema-related optic disc leakage in addition to hyperfluorescent lesions distributed within the macular area and above the temporal arcades (figure 3).

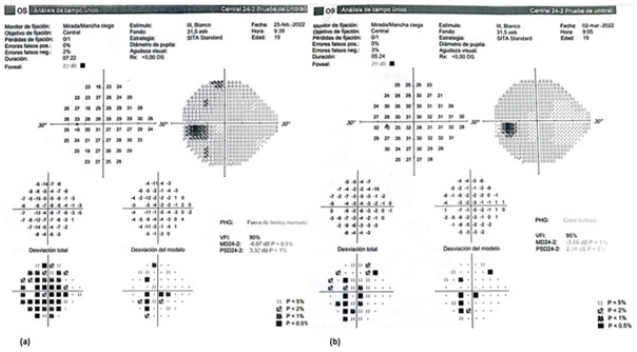

Figure 1 CVC 24-2 (a) Increased blind spot and associated central defect, pretreatment image. (b) Posttreatment: Improvement of the central defect and decrease in the size of the blind spot.

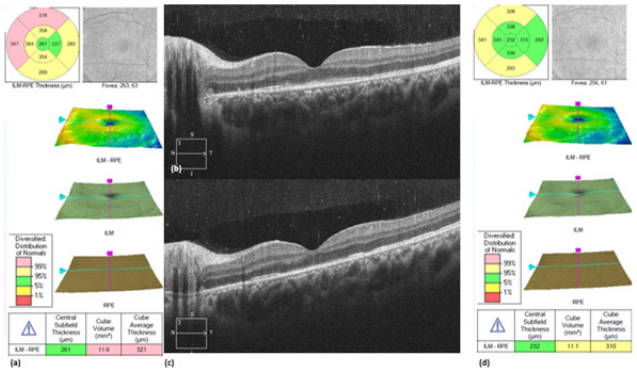

Figure 2 Macular OCT: Image a and b pretreatment and c and d posttreatment. (a) Generalized increase in thickness and macular cube. (b) Presence of vitreous opacities, MER Govetto I, interruption of ellipsoids and EML, presence of subretinal hyperreflective material. (c) Decrease in thickness, central and in the normal 3 mm area. (d) Reduction of vitreous opacities, hyperreflective material and interruption zones of external hyperreflective lines.

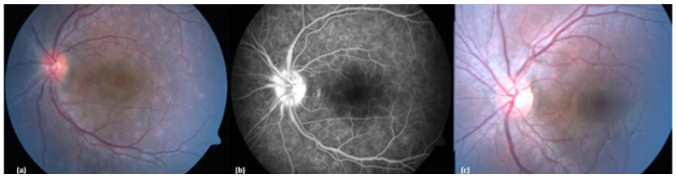

Figure 3 Fluorescein angiography: (a) Pretreatment color photo shows diffuse optic disc edges and multiple grayish-white lesions distributed in the posterior pole. (b) Upon passage of the contrast medium, peridiscal leakage and multiple scattered hyperfluorescent lesions are observed. (c) post-treatment color photo without the presence of grayish-white lesions.

Considering the paraclinic tests results, it was concluded that the patient had multiple evanescent white dot syndrome. Management started using intravenous corticosteroid for three days following deparasitization, upon which an improvement in visual acuity was encountered (20/30+2 measured with the Snellen chart) 4 days after corticosteroid treatment started; likewise, the clinical signs assessed by indirect ophthalmoscopy and photos of the ocular fundus had been resolved completely and the macular OCT findings exhibited an improvement in the clinical signs and the blind spot enlargement as documented by CVC 24-2 (figure 1 & 2). After two weeks of treatment, VA of 20/20 was documented in both eyes.

Discussion

Dr. Lee M. Jampol described for the first time the clinical features of the MEWDS in 1984. Typically, it occurs in young myopic females exhibiting temporary grey-white lesions in the ocular fundus associated to a slight degree of affectation in the optic nerve, which were resolved spontaneously without treatment.[3]

The initial visual acuity in these patients ranged between 20/20 and 20/300. Numerous small white spots can be identified in the ocular fundus (100 a 200 µm), mainly in the posterior pole, but they can extend beyond the vascular arcades. Vitrous cells and blurred margins of the optic disc were often found. Although it is usually unilateral, bilateral MEWDS has been reported and it can exhibit asymmetric affectation.[4]

The angiography usually showed early and late hyperfluorescence of the white dots, forming a pattern often described as a crown that overlaps the bigger dots which correspond to the clinical lesions and capillary leakage in the optic disc; once the lesions are resolved, window defects could be observed.[1,4] On the other hand, the OCT rendered hyper-reflective imaging forming a dome in the subretinal space and below this lesion an increase in the acute phase choroidal reflectivity could be observed. The high resolution OCT also showed an alteration of the ellipsoid zone. Hypoautofluorescent areas concentrated around the optic disc and the posterior pole could be observed in the autofluorescence. Areas of hyperautofluorescence, corresponding to the white spot, were also observed.[1,2,4] Yannuzzi et al described the double-layer lesions denominated "dots over spots"; the "dots" lie in the Henle fiber layer and the outer nuclear layers and overlap the bigger "spots", which involve the ellipsoid and interdigitation zones. These dots can be detected through OCT and ocular fundus autofluorescence imaging.[3] Electrophysiology studies have found reduced a waves in the electroretinogram (ERG), which suggested a primary participation of the outer segments of the photoreceptors. Finally, the visual field typically showed enlargement of the physiological blind spot.[4]

Typically, there is no evidence of persistent anatomic changes in the retinal pigmentary epithelium or the choroid in primary MEWDS. The most relevant is that MEWDS exhibits complete recovery of the visual function, including the white dot enlargement.[3] Choroidal neovascularization is very rare, but if it is present, it can affect the visual prognosis.[4]

The presence of two forms of MEWDS has been questioned in recent years, the primary form described originally by Jampol et al and a secondary form described as a macular disease or a retinal iatrogenic lesion. In 2002 Bryan et al.,[6] reported for the first time MEWDS in a patient with Best disease. Further associated conditions have recently been reported, such as acute zonal occult outer retinopathy, toxoplasmosis, retinal trauma, retinopexy, retinal detachment, subretinal hemorrhage, choroidal neovascularization, and multifocal

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choroiditis. Secondary MEWDS seems to have a course similar to that of primary MEWDS, which includes spontaneous resolution and the recovery of vision. The difference is in the addition of the clinical features of the triggering associated retinal pathology.[3]

As it has been said, the MEWDS is a self-limited disease, registers total recovery of vision and the structural changes observed through multimodal imaging upon several weeks of evolution without treatment.

In 2016 Marsiglia et al.,[7] made the follow up of 34 patients with MEWDS without treatment and found that the median for the recovery of vision was 10 weeks. Similarly, Lombardo[8] reported that the recovery of visual acuity and the resolution of the clinical findings without treatment usually occurred within 6 to 10 weeks of clinical course.

However, there are also reports of cases in which systemic corticosteroid therapy has been used, either intravenous or oral for the treatment of MEWDS, with which a much faster response has been obtained without reporting any additional adverse effects so far. In the case of the patient selected for the present study, once further differential, inflammatory, or infectious diagnoses were discarded, pulse methylprednisolone dosing for 3 consecutive days was used. Once management with corticosteroids ended, the patient showed an improvement of the visual acuity (20/400 to 20/30+2) and 2 weeks after the treatment started visual acuity had been completely recovered.

As in the patient selected for this study, Takahashi et al.,[9] encountered an improvement of visual acuity from 20/400 to 20/25 within the 3 days of the steroid pulse therapy (3000 mg for 3 days) in a patient with MEWDS.

Norooznezhad et al.,[5] decided to use corticosteroid therapy, in this case the authors decided to apply a short cycle of 0.75 mg/kg/day of prednisolone, with which the patient had an improvement of the initial visual acuity from 20/140 to 20/25 after a week of treatment, with a complete recovery upon 3 weeks of treatment.

These findings could represent an alternative for the management of patients with MEWDS in order to offer, in selected cases, a much faster recovery. It is particularly important to take this alternative into consideration in secondary MEWDS cases which might turn out to be more complex involving compromise of the visual function.

Conclusion

The multiple evanescent white dot syndrome, either in its primary or secondary form, features the presence of grey-white lesions located in the outer retina, pigmentary epithelium of the retina, and choroids. The etiology is unknown; however, there are many theories including infectious, genetic, and autoimmune causes, in addition to possible triggering factors such as the hormonal state, immunization through vaccines or stress. The majority of individuals affected are young males and females, although it is more frequent in females between 20 and 50 years of age. The major difficulty with the white dot syndrome occurs mainly at the moment of the diagnosis, as it can be confused with other differential diagnoses which have a worse functional prognosis. In the present study it was important to take into consideration infectious neuroretinitis causes which might compromise the prognosis of visual acuity; however, the ocular fundus findings documented through diagnostic aids allowed to obtain a final diagnosis. Although MEWDS is a self-limited disease, corticosticoid management is an alternative in selected patients who have high visual acuity compromise, in order to offer a faster recovery, as in the case of the patient selected for the present work.

Acknowledgments

None.

Conflicts of interest

The authors of the present article do not have any conflicts of interest.

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