Journal français d'ophtalmologie (2016) 39, 355—363

Disponible en ligne sur ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com

ORIGINAL ARTICLE

Prevalence of macular complications associated with high myopia by multimodal imaging☆

Prévalence des complications maculaires liées à la myopie forte analysées par imagerie multimodale

O. Lichtwitz[a,*], M. Boissonnot[a], M. Mercié[a], P. Ingrand[b], N. Leveziel[a,c]

[a] *Department of ophthalmology, Poitiers university hospital, 2, rue de la Milétrie, 86021 Poitiers, France*
[b] *Department of public health, Poitiers university hospital, 2, rue de la Milétrie, 86021 Poitiers, France*
[c] *Inserm 1084, 86021 Poitiers, France*

Received 27 September 2015; accepted 12 November 2015
Available online 22 March 2016

KEYWORDS
High myopia;
Prevalence;
Macular complications;
Choroidal neovascularization;
Choroidal thickness

Summary
Purpose. — To describe the prevalence of macular complications in patients with visual acuity decrease related to high myopia (HM). To establish correlations between these complications and demographic or anatomical characteristics.
Materials and methods. — Cross-sectional observational study including HM patients undergoing best-corrected visual acuity (BCVA), fundus examination, macular SD-OCT, and fluorescein angiography in the case of suspicion of choroidal neovascularization (CNV). The presence of anatomical criteria (staphyloma, subfoveal choroidal thickness [CT]) and macular complications (CNV, lacquer cracks, central chorioretinal atrophy, dome-shaped macula with serous retinal detachment [SRD], retinal foveoschisis, macular hole and epiretinal membrane) was investigated.
Results. — A total of 87 eyes of 47 patients were included (39 eyes without macular complication and 48 eyes with macular complications). In the case of macular complications, decrease in

☆ Research presented as a poster at the ARVO Congress in May 2014 (Orlando, USA).

* Corresponding author.
E-mail address: olivier.lichtwitz@hotmail.fr (O. Lichtwitz).

http://dx.doi.org/10.1016/j.jfo.2015.11.005

BCVA was related to CNV in 33%, macular hole in 25%, chorioretinal atrophy in 19%, foveoschisis in 11%, lacquer crack in 6%, to a dome-shape macula with serous retinal detachment in 4% and epiretinal membrane in 2%. After adjusting for interocular correlation and degree of myopia, staphyloma ($P = 0.0023$), choroidal thinning ($P = 0.0036$), and extrafoveal chorioretinal atrophy ($P = 0.042$) were significantly associated with macular complications.
Conclusions. — High myopic patients with staphyloma or choroidal thinning should undergo regular comprehensive retinal screening for retinal complications.

MOTS CLÉS
Myopie forte ;
Prévalence ;
Complications maculaires ;
Néovascularisation choroïdienne ;
Épaisseur choroïdienne

Résumé
Objectif. — Décrire la prévalence des complications maculaires chez des patients présentant une baisse d'acuité visuelle liée à une myopie forte. Établir des corrélations entre ces complications et les caractéristiques démographiques ou anatomiques.
Matériels et méthodes. — Étude observationnelle, transversale d'une série de patients présentant une myopie forte. Chaque patient a bénéficié des examens suivants : meilleure acuité visuelle corrigée (MAVC), fond d'œil, SD-OCT maculaire, angiographie à la fluorescéine en cas de doute diagnostique sur une néovascularisation choroïdienne (NVC). La présence des critères anatomiques (staphylome, épaisseur choroïdienne sous-fovéolaire) et la recherche des complications maculaires (NVC, rupture de la membrane de Bruch, atrophie choriorétinienne centrale, macula bombée associée à un décollement séreux rétinien [DSR], fovéoschisis, trou maculaire et membrane épirétinienne) ont été étudiés.
Résultats. — Au total, 87 yeux de 47 patients ont été inclus (39 yeux sans complication maculaire et 48 yeux avec des complications maculaires). En cas de complication maculaire, la baisse de la MAVC était liée dans 33 % à une CNV, 25 % à un trou maculaire, 19 % à une atrophie choriorétinienne centrale, 11 % à un fovéoschisis, 6 % à une rupture de la membrane de Bruch, 4 % à une macula bombée associée à un DSR et 2 % à une membrane épirétinienne. Après ajustement à la corrélation interoculaire et au degré de myopie, le staphylome ($p = 0{,}0023$), l'amincissement choroïdien ($p = 0{,}0036$) et l'atrophie choriorétinienne extrafovéolaire ($p = 0{,}042$) étaient significativement associés à des complications maculaires.
Conclusion. — Les patients myopes forts présentant un staphylome ou un amincissement choroïdien devraient bénéficier d'une attention particulière et d'un dépistage régulier des complications rétiniennes.

Introduction

High myopia (HM) is defined by a refractive error exceeding −6 diopters or by an axial length of 26 mm or more. HM is a major cause of visual acuity (VA) loss worldwide and also a major cause of legal blindness in many countries, mainly in Asia [1,2]. The socio-economic burden of blindness and visual impairment related to myopia and high myopia is considerable, as the disease typically affects individuals during their productive years [3]. HM is frequently associated with a dynamic process of progressive increase of the curvature of the posterior pole and with anomalies of the eyeball curvature also called staphyloma, both of which lead to the development of a large panel of chorioretinal complications including choroidal neovascularization (CNV), macular hemorrhage due to lacquer cracks, chorioretinal atrophy, macular retinoschisis, junctional syndrome, dome-shaped macula, epiretinal membrane and macular hole with or without retinal detachment [4]. These complications are particularly likely to occur in patients with high axial length and in eyes with posterior staphyloma [5]. In the context of HM, multimodal imaging is particularly necessary because acquisition of imaging and interpretation of images are frequently challenging for morphological reasons. Fluorescein angiography helps to distinguish between myopic CNV and lacquer cracks combined by retinal haemorrhage but usually does not provide any additional information in case of foveoschisis. On the other hand, spectral domain optical coherence tomography (OCT) can provide additional quantitative and qualitative information in case of vitreo-macular interface anomalies, foveoschisis, dome-shape macula and myopic CNV [6].

Up until now, few studies have evaluated the prevalence of the macular complications responsible for visual acuity decrease in HM in Caucasian populations [7].

The aim of this study was to describe the prevalence of macular complications involving the fovea in patients with VA decrease related to HM and to establish correlations between these complications and demographical or anatomical characteristics.