Central Serous Chorioretinopathy in African Americans at Wilmer Eye Institute

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Abstract: Objective: To evaluate the frequency of central serous chorioretinopathy (CSC) in African Americans/blacks within an academic center in a predominantly African American city, as the current belief is that CSC is rare in this population.

Methods: A retrospective review of all patients' charts diagnosed with CSC at Wilmer Eye Institute/Johns Hopkins University from August 2009–August 2015 was conducted via an electronic health record search (EPIC). The charts were categorized by self-reported race and gender. The diagnosis was confirmed by multiple physician consensus through chart and imaging review. Fluorescein angiograms were classified as single versus multiple point leakage. OCTs were evaluated for subfoveal thickness, location of fluid, presence or absence of pigment epithelial detachment. Color photos were categorized as to the extent of retinal pigment epithelial changes.

Results: Of the 590 charts identified via EPIC as CSC patients, 407 were confirmed as CSC through chart and imaging review. 45 patients (11.1%) were African Americans and 298 patients (73.2%) were Caucasians. Of all patients seen during the study period, 0.09% of African Americans at Wilmer had CSC and 0.18% of Caucasians had CSC. While three fold more Caucasians were seen during the study period as compared to African Americans, this study's prevalence rate in African Americans/blacks at Wilmer Eye Institute was half of that in Caucasian/whites.

Conclusions: CSC has been reported as exceedingly rare in African Americans, but our study suggests that CSC may be underestimated in this population. A large nationally representative population based study is needed to determine true racial prevalence to ensure that the diagnosis of CSC is not overlooked in African Americans.

Keywords: African American■Central serous chorioretinopathy■Macula■Ophthalmology■Retina

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INTRODUCTION

Central serous chorioretinopathy (CSC) is reported as rare in African Americans.[1–6] While there are limited population based studies of CSC,[1,7] these reports originated in areas with low black representation. A clinical review in 1987[2] stated that CSC is seldom seen in African Americans but no specific African American prevalence rate was reported. Subsequently, multiple sources have also reported the rarity of this disease in this particular population but do not provide specific prevalence rates.[3–6] Only one United States population study of CSC exists and it reported no African American cases out of their total 74 cases,[1] but this study originated in Minnesota where the African American census is low. However, two publications from cities with a large African American/black population question this notion.[8,9]

CSC is a choroidopathy with a male predilection that results in leakage of fluid through the retinal pigment epithelial into the subretinal space that can result in visual loss.[10] Associations with Type-A personalities, pregnancy, steroid usage, and Cushing's syndrome have been reported.[2,11,12] Since these associations are not related to race, it is questionable why CSC would be rare in African Americans and raises concerns of possible racial selection bias in clinical populations.

According to the 2016 United States census data, the African American/black population country wide is 13%.[13] Wilmer Eye Institute at Johns Hopkins School of Medicine is located in a city that is 63% African American.[14] As previous reports stating that CSC is rare in African Americans may have been due to racial selection bias in clinics with a low African American population, we conducted a retrospective review of all the patients with CSC seen at the Wilmer Eye Institute from August 2009 to August 2015. Since Wilmer Eye Institute has a large African American patient population, selection bias based on race would be less likely than at other institutions with a smaller African American patient base and may help provide insight into whether the current belief that CSC is extremely rare in African Americans is accurate.

In the present study, we report the findings in African American patients with CSC seen at Wilmer Eye Institute.

MATERIALS AND METHODS

We conducted an electronic medical record search of all Wilmer Eye Institute patients seen from August 2009 to August 2015 using the term central serous

chorioretinopathy (ICD 9 code – 362.41). EPIC is the electronic health record used at Wilmer Eye Institute. Institutional Review Board approval was obtained at Johns Hopkins University School of Medicine. The EPIC search detected all charts with this code in the problem list, even if it was not the primary diagnosis for a particular visit.

Exclusion criteria during the EPIC search were confounding exudative macular diseases like polypoidal choroidal vasculopathy, neovascular age related macular degeneration and Vogt-Koyanagi-Harada. Patients with other causes for increased choroidal thickness such as posterior uveitis or scleritis were also excluded during the chart search.

All patients seen for any reason during the study period of August 2009 to August 2015 were categorized by self-reported race to determine the racial make-up of the Wilmer Eye Clinic patient population during that time, as it may not mirror the racial population percentages of Baltimore City. The 590 charts identified as CSC were then evaluated when masked to race and gender.

The database obtained from the EPIC search contains the charts and diagnostic images of all the patients meeting the inclusion criteria. While masked to demographic variables such as race, we reviewed all chart documentation to verify the diagnosis. Charts were excluded if the patient was referred for CSC but was found not to have CSC on retinal examination. Another reason for exclusion was insufficient evidence such as lack of a dilated examination or fundus imaging if the patient came in for a non-retinal concern.

Demographic details were recorded along with usual corrected visual acuity at the first visit in both the affected and unaffected eye. Current age was recorded as the age at the time of the first examination with a diagnosis of CSC. Race was self-reported by the patients in the demographic section of the electronic medical record. Pinhole/manifest refraction was not recorded in this retrospective study as it was not consistently recorded in the charts. Symptomatic eyes were defined as those with fluid on presentation.

Charts were then sorted into two groups. Group A had fluorescein angiography (FA) confirmed CSC. Thirty degree images were obtained with the Zeiss FF-4 camera. Characteristic pinpoint leakage patterns on FA were considered diagnostic for CSC. Group B did not have FA, but did have documented spontaneous resolution of subretinal fluid on optical coherence tomography (OCT) in conjunction with exam findings consistent with CSC. Since the study was retrospective dating back to 2009, the OCT device changed over time and data analysis includes Zeiss Stratus, Cirrus OCT and Heidelberg OCT images.

The following data were collected during imaging review. OCT subfoveal retinal thickness, presence of subretinal or intraretinal fluid, and presence of retinal pigment epithelial detachment (PED) were recorded. Since the study was retrospective, both time and spectral domain results were included. We also noted the presence of a single or multiple leaks on FA and evidence of any descending tracts. Retinal pigment epithelial (RPE) changes were classified as more than or less than $^1/_4$ disc area based on 30° color photos. Given that there were very few enhanced depth imaging OCTs and indocyanine green angiograms, we did not record this choroidal imaging data.

RESULTS AND DISCUSSION

Overall findings (see Table 1)

Of the 249,073 patients seen at Wilmer from August 2009 to August 2015, 52,247 (21%) self-identified as African American/black, 164,127 (66%) were Caucasian/white and 9517 (3.9%) were Asian. Less commonly seen races at Wilmer included 661 (0.2%) Hispanics, 532 (0.2%) American Indians, 119 (0.1%) Native Hawaiian. 20,943 (8.5%) did not document their race and 927 (0.4%) declined to confirm their race. 45 (0.09%) of the 52,247 African Americans seen at Wilmer during the study period had CSC, while 298 (0.18%) of the 164,127 Caucasians seen had CSC.

590 charts with CSC were identified via the EPIC search. 407 of these charts met our criteria for CSC diagnosis. 312 of these charts had FA confirmed CSC (Group A) and 95 charts had documented SRF resolution without any FA imaging (Group B). Of the 407 confirmed CSC cases, 45 (11.1%) were African American, 298 (73.2%) were Caucasian/white, 31 (7.6%) were Asian and the remaining 33 (8.1%) were of unknown race. This paper will focus on the largest racially represented groups, African American/black and Caucasian/white.

183 charts were excluded due to lack of evidence to confirm the diagnosis of CSC or incorrect diagnosis. 33 of the excluded patients (18.2%) were African American/black, 72 (39.3%) were Caucasian/White population, 27 (14.7%) were Asian and 51 (27.8%) were of the unknown race.

Following are examples of excluded patients.

117 optometry or general ophthalmology notes listed CSC in the history but there was no imaging or dilated fundus examination resulting in insufficient evidence for the diagnosis of CSC.

66 charts referred to Wilmer retina service for CSC but actually had confounding conditions such as advanced age related macular degeneration or other diagnoses such as idiopathic choroidal neovascularization, pattern dystrophy, cone dystrophy, or Stargardt disease.