Research Square

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Demographic and clinical characteristics of Uveal Melanoma in Chile

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Abstract

Background

Uveal melanoma exhibits significant differences in incidence and clinical course across racial and ethnic groups. Hispanics remain underrepresented in the uveal melanoma literature. The purpose of this study is to collect representative information of the Chilean population, to better characterize the presentation of uveal melanoma in a predominantly Hispanic Chilean cohort.

Methods

Retrospective multicenter study of patients with a new diagnosis of uveal melanoma evaluated at four centers, two multispecialty hospitals and two ophthalmology-specialized centers, between October 2019 and January 2026.

Results

We found 135 patients. Mean age was 58.7 years (17–86). 73 patients (54.1%) were female. 85.2% were Hispanic and 14.8% Caucasian. The affected eye was the left eye in 68 patients (50.4%; p = 0.93). A history of a previous primary malignancy was present in 14.8% of patients. Choroidal tumors predominated (85.9%), followed by the ciliary body (7.4%) and the iris (6.7%). Mean tumor height was 6.8 mm (1.1–15.0 mm). Tumors were predominantly medium-sized lesions (54.1%), with detectable metastases at diagnosis present in 3.0% of patients. Plaque brachytherapy was the proposed primary treatment in 59.3% of patients, and enucleation in 38.5%.

Conclusions

The majority of patients were of Hispanic ethnicity. Clinical characteristics were similar to those described in the literature. However, our cohort showed a higher proportion of female patients and presented with thicker tumors.

Background

Uveal melanoma is the most common primary intraocular malignancy in the adult population, and the term is used to group choroidal, ciliary body, and iris melanomas [1]. The mean age-adjusted incidence of uveal melanoma in the United States is 5.1 per million [1]. Although few studies focus on the incidence of uveal melanoma between races or ethnic groups, it has been shown to occur at varying frequencies across them [2]. The incidence of uveal melanoma in the general population goes from 0.31 per 1 million inhabitants (black population) to 6.02–6.9 per 1 million inhabitants (Caucasian population).

Hispanics tend to be in the lower half of this range, with an annual incidence of about 1.67–2.50 per 1 million inhabitants [2].

Most studies on epidemiology and clinical course of uveal melanoma come from countries with predominantly Caucasian populations, such as the USA and European countries [1–6]. As a result, Hispanics remain underrepresented in the uveal melanoma literature.

Genetic studies have shown that, in Chile, 88% of the population is of native-American origin and 11% is of European origin [7].

The aim of this study is to collect data representing the Chilean population, to better characterize the presentation of uveal melanoma in a Hispanic-predominant country, and to analyze if there are significant differences compared to the literature.

Methods

We conducted a retrospective, multicenter descriptive study including patients from four health care centers in Santiago de Chile: two multispecialty tertiary hospitals —Clínica Alemana de Santiago (Clínica Alemana de Santiago Hospital) and Hospital Dr. Sótero del Río (Dr. Sótero del Río Hospital)— and two specialized ophthalmology centers —Instituto Oftalmológico Puerta del Sol (Puerta del Sol Ophthalmology Institute) and Clínica Oftalmológica Pasteur (Pasteur Ophthalmology Clinic).

We identified patients who received a new diagnosis of uveal melanoma between October 2019 and January 2026, including tumors located in the choroid, iris, and ciliary body. We recorded clinical characteristics, including race, age, sex, iris color, personal history of cancer, presenting symptom, duration of symptoms before diagnosis, and visual acuity at presentation. Ethnicity was ascertained from surnames (paternal and maternal sides) and confirmed by self-report during participant interviews and/or extraction from medical records.

We also recorded the following tumor characteristics: epicenter location (iris, ciliary body and choroid), main basal diameter, height, shape (dome-shaped, mushroom-shaped, diffuse, minimally elevated and multilobulated), and presence of metastases at diagnosis. Each tumor was categorized by size as small, medium or large based on the Collaborative Ocular Melanoma Study (COMS) criteria. [8]. The American Joint Committee on Cancer (AJCC) 8th edition staging system was also applied for TNM classification [9].

The statistics are descriptive, with frequencies and percentages for categorical variables and summary measures for continuous variables.

The statistical analysis was performed using Microsoft Excel 365, version 2410.

The study was classified as minimal risk and was, therefore, granted a waiver by the IRB of each center for written informed consent. All methods were conducted in accordance with relevant guidelines and

regulations, including the principles outlined in the Declaration of Helsinki.

Results

Table 1 summarizes the demographic findings of our study and Table 2 the tumor characteristics. We found 135 patients with a new diagnosis of uveal melanoma in the four institutions participating in this study. Mean age was 58.7 years (range 17 to 86 years; median age 60.0; SD 15.1). Of the patients, 73 (54.1%; p = 0.34) were women. Ethnicity was reported as Hispanic in 85.2% of patients and Caucasian in 14.8%. There were no Black or Asian patients. Iris color was Brown in 112 patients (83.0%), green in 17 patients (12.6%), and blue/gray in 6 patients (4.4%). Twenty patients (14.8%) had a history of previous malignancies elsewhere. Four patients (3.0%) showed detectable metastases at diagnosis.

There were no presenting symptoms in 15.6% of patients and the tumor was detected during a regular ophthalmology visit or in a retinography during diabetic retinopathy photoscreening. The main symptom was visual acuity loss, present in 60.0% of patients, followed by floaters and photopsias in 8.9%. Four patients (3.0%) presented with a vitreous hemorrhage.

Table 1
Patients demographics

Characteristic	n (%)
Patient total	**135 (100%)**
Age (years, mean ± SD)	58.7 ± 15.1 (range 17–86 years)
Female sex	73 (54.1%; p = 0.34)
Ethnicity	Hispanic 115 (85.2%)
	Caucasian 20 (14.8%)
Iris color	Brown 112 (83.0%)
	Green 17 (12.6%)
	Blue/gray 6 (4.4%)
Previous malignancies	20 (14.8%)
Metastases at diagnosis	4 (3.0%)
Presenting symptom	Asymptomatic 21 (15.6%)
	Visual acuity loss 81 (60.0%)
	Floaters and photopsias 12 (8.9%)
	Visual field defect 10 (7.4%)
	Vitreous hemorrhage 4 (3.0%)
Note: Data are presented as mean +/- standard deviation (SD) for continuous variables and n (%) for categorical variables	

Table 2 summarizes tumor characteristics. The affected eye was the right eye in 67 patients (49.6%) and the left eye in 68 patients (50.4%; p = 0.93). The epicenter location was the choroid in 116 patients (85.9%), the ciliary body in 10 patients (7.4%) and the iris in 9 patients (6.7%).

The most common shape on ultrasonography was the dome with 80 cases (59.3%), followed by the mushroom shape in 36 patients (26.7%). Nine patients (6.7%) presented a multilobulated tumor, and 3 (2.2%) a minimally elevated tumor.

Mean tumor height was 6.8 mm (range 1.1 to 15.0 mm; median height 6.3 mm; SD 3.9). Regarding tumor size according to COMS classification, 73 cases (54.1%) were medium size tumors, 42 (31.1%) were large and 20 cases (14.8%) small.

According to the AJCC classification, 26 patients (20.5%) presented with a T1 tumor, 40 patients (31.5%) with a T2 tumor, 46 patients (36.2%) with a T3 tumor, and 15 patients (11.8%) with a T4 tumor.

Plaque brachytherapy was proposed as primary treatment to 80 patients (59.3%) and enucleation to 52 patients (38.5%).

Table 2
Tumor characteristics

Left eye	**68 (50.4%; p = 0.93)**
Epicenter location	Choroid 116 (85.9%)
	Ciliary body 10 (7.4%)
	Iris 9 (6.7%)
Shape on ultrasonography (choroid and ciliary body)	Dome 80 (59.3%)
	Mushroom 36 (26.7%)
	Multilobulated 9 (6.7%)
	Minimally elevated 3 (2.2%)
Tumor height (mean ± SD)	6.8 ± 3.9 mm (range 1.1–15.0 mm; median 6.3 mm)
COMS Size	Small 20 (14.8%)
	Medium 73 (54.1%)
	Large 42 (31.1%)
AJCC Classification (choroid and ciliary body)	T1 26 (20.5%)
	T2 40 (31.5%)
	T3 46 (36.2%)
	T4 15 (11.8%)
Primary Treatment	Brachytherapy 80 (59.3%)
	Enucleation 52 (38.5%)
	Other 3 (2.2%)
Note: Data are presented as mean +/- standard deviation (SD) for continuous variables and n (%) for categorical variables	

Discussion

Uveal melanoma is the most frequent primary intraocular malignant tumor in adults [1]. However, its incidence in Chile is unknown. The most frequent ethnic group in Chile is Native-American or Hispanic [7]. It could be thus estimated a similar incidence to the one reported in Hispanic population in the literature [2]. In the present study we gather and analyze clinical characteristics of patients and tumors in uveal melanoma cases, to define the presentation of uveal melanoma patients in a predominantly

Hispanic country, information seldomly reported in the literature. Our sample is composed of a large majority of Hispanic patients (85.2%), which reflects the ethnic composition of the country reported in genetic studies of the population. [7]

Regarding age at diagnosis, our patients are in line with data previously described in the international literature [1, 4–6, 10]. Fernandes et al [10] reported a mean age of 61.67 years in their series of 70 Brazilian patients, which is similar to our data. However, some case series of Hispanic patients have reported younger ages at diagnosis. Hudson et al [11] reported in their series a mean age of 52.4 years in 20 Hispanic patients. Delgado et al [12] reported a mean age of 46 years in their study of 39 patients. It is worth noting that both studies refer only to enucleated patients.

In our series, 54.1% of patients were female. This differs from what is reported in the literature, where women account for 47.8 to 49% of patients [1, 4–6, 10]. Fernandes et al [10] report a female proportion of 47.14% in their Brazilian cohort. This discrepancy may partly reflect selection bias due to cultural practices in less urban areas, where women typically seek healthcare earlier than men.

Twenty of our patients (14.8%) had a history of previous malignancies, which is slightly higher the 11.4% reported by Singh et al. [1].

Our patients presented a mean tumor height of 6.8 mm at diagnosis. In comparison, the mean height at presentation reported by Shields et al [4] was 5.5 mm. In contrast, the series of Brazilian patients of Fernandes et al [10] had a mean tumor height of 9.19mm and the one of Delgado et al [12] reported higher tumors, with a mean height of 10.9mm. However, it should be noted again that this last series is composed only of enucleated patients. The observed difference in tumor height at diagnosis compared with the cohort reported by Shields et al. may be attributable, at least in part, to longer diagnostic delays or barriers to timely access to specialized ocular oncology care. Such patterns of delayed presentation to subspecialty services have been previously reported in Latin America [10]. In contrast, our cohort presented smaller tumors than those described in series from Mexico and Brazil (10, 12), which may reflect earlier referrals to our center.

Plaque brachytherapy was the proposed primary treatment in 59.3% of patients. This is similar to the 62.5% of radiation treatment reported by Singh et al [1]. The similarity in rates of conservative treatment between our cohort and US series may suggest comparable access to advanced ocular oncology resources in our Chilean centers, despite broader regional disparities in specialized care availability in Latin America.

Limitations of our study include the retrospective nature of the study, which may introduce selection and information biases. The cohort may lack full geographic representativeness across the country, potentially leading to regional selection bias. Ethnicity ascertainment relied on surnames combined with self-report or record review as previously described in the literature [11], a practical surrogate in the absence of genetic testing, which can result in misclassification. Additionally, multicenter participation may have caused inconsistencies in data collection due to differences in electronic health records.

Conclusions

The vast majority of our patients were of Hispanic ethnicity. Some characteristics were similar to those described in the literature, such as age at diagnosis and history of previous malignancies, as well as the use of radiation as the most frequent primary treatment. However, our patients were more likely to be female and present with larger tumors. These observations reinforce the importance of educational initiatives on ocular tumors and the facilitation of early referrals to specialized tertiary centers, particularly in regions with variable access to advanced care.

Analyzing patients in a Hispanic-predominant country can help us to better understand the distinctive aspects of uveal melanoma in an ethnic group that has been underrepresented in the international literature.

Abbreviations

COMS
Collaborative Ocular Melanoma Study
AJCC
American Joint Committee on Cancer

Declarations

Ethics approval and consent to participate

This study protocol was reviewed and approved by the IRB of each participating center. It was classified as minimal risk, since no patient identifying information was utilized and was, therefore, granted a waiver by the IRB of each center for written informed consent. These IRB are: Comité Ético Científico - Facultad de Medicina - Clínica Alemana de Santiago-Universidad del Desarrollo, Comité de Evaluación Ético Científico - Servicio de Salud Metropolitano Suroriente, Comité de Ética Asistencial - Instituto Oftalmológico Perta del Sol, Comité de Ética Institucional - Clínica Oftalmológica Pasteur.

Consent for publication

Not applicable

Competing Interests

The authors declare that they have no competing interests.

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Author Contribution

Patients were evaluated by EL, CL, and AM. Material preparation, data collection, and analysis were performed by EL and CL. The first draft of the manuscript was written by EL. All authors (EL, CL, AM and MC) contributed to the study conception and design, commented on the previous versions of the manuscript, and have read and approved the final manuscript

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Data Availability

The data that support the findings of this study are available on request from the corresponding author, E.L.

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