

Incidence of ocular melanoma in the general population and in glaucoma patients

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Intraocular melanomas are the most common primary ocular malignancy in white people accounting for approximately 70% of all eye malignancies in adults.¹ Most ocular melanomas arise from uveal melanocytes distributed throughout the stroma of the choroid,² only 4%–10% of uveal melanomas originate in the iris.³

Data on the incidence of intraocular melanoma are limited with estimates of incidence rate (IR) reported between 4 and 8 per million per year.¹ Known risk factors include advanced age and white people but there are very few studies describing other potential risk factors for uveal melanoma.⁴

We conducted a study using the General Practice Research Database (GPRD) to estimate the incidence rate of ocular melanoma in the general population. As a secondary objective, we investigated whether glaucoma is associated with ocular melanoma.

Methods

Our source population came from the GPRD, which contains clinical information on about 3 million patients recorded by general practitioners in the United Kingdom. The geographical distribution of the practices participating in the GPRD is representative of the UK population, apart from small variations between regions.⁵ Recent comparisons of age and sex distribution with the National Population Census have shown these to be closely similar.⁵ The general practitioners systematically record data on their patients and sent them anonymously to the Medicine Control Agency. A previous validation study has documented that over 90% of all referrals present in the manual records in the GPs' offices are entered into the GPs' computers with a code that reflects the clinical diagnosis.⁶ An additional requirement of this data resource is that the indication for any new course of treatment be entered in the computer. In addition, the GP may record laboratory results and other medical data in a free text comment field. A modification of the OXMIS classification is used to code specific diagnoses, and a drug dictionary based on the Prescription Pricing Authority drug dictionary is used to record drugs. We identified all patients 40 to 85 years old at 1 January 1992 free of cancer including ocular melanoma. Among them, we studied two different cohorts, a general population cohort that included those patients free of glaucoma, and a cohort of patients with a recorded diagnosis of glaucoma. We validated the diagnosis of glaucoma in a random sample of 100 patients with a questionnaire sent to the GP. We received valid information in 95

patients, and of them 85 were confirmed as cases of glaucoma (confirmation rate of 89%). Our study included 812 853 people in the general population cohort and 24 131 patients in the glaucoma cohort. We followed up both cohorts until the earliest occurrence of one of the following end points: ocular melanoma, cancer other than ocular melanoma, death or 30 September 1998. We then identified in both cohorts those with a code of ocular melanoma during the study period and reviewed manually their complete computerised medical patient history. After this review 64 patients were retained as potential cases of ocular melanoma. To confirm the diagnosis of ocular melanoma, we sent a questionnaire to the general practitioners of all 64 patients requesting their confirmation as an incident case of ocular melanoma and a copy of all hospital summaries as well as letters from the specialist related to this diagnosis. We received valid information in 60 cases, of these 45 were confirmed as incident cases of ocular melanoma and 15 were excluded (the diagnosis was not confirmed in two cases, nine had other eye pathology and four had melanoma in other locations).

We calculated the incidence rate of ocular melanoma and 95% confidence intervals in the two cohorts, general population and glaucoma. Incidence rates were calculated dividing the number of cases of ocular melanoma by the corresponding number of person years at risk. We then compared the incidence rate in the cohort of glaucoma patients with the incidence rate in the general population and calculated the relative risk and exact 95% confidence intervals of ocular melanoma associated with glaucoma.

Results

The total follow up experience in the general population was 3 869 218 person years and 90 612 in the glaucoma cohort. Forty five patients were confirmed as incident cases of ocular melanoma in the general population cohort and there was no confirmed case of ocular melanoma in the glaucoma cohort. From the questionnaires we could only obtain information on type of ocular melanoma in 29 cases. Among these, choroidal melanoma accounted for 86% of them. The site was available in 32 cases with 19 located in the right eye and 13 in the left. The incidence of ocular melanoma in the general population cohort increased considerably with age and was similar among men and women (table 1). The overall annual incidence rate in the general population cohort was 11.6 per 1 000 000 persons years (95% CI 8.7, 15.6). The relative risk

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Table 1 Incidence of ocular melanoma by age and sex in the general population

	Person years	Ocular melanoma cases	Incidence rate (95% CI)*
Age			
40-64	2 547 992	22	8.6 (5.7, 13.1)
≥65	1 321 227	23	17.4 (11.6, 26.1)
Sex			
Male	1 771 713	21	11.8 (7.8, 18.1)
Female	2 097 506	24	11.4 (7.7, 17.0)
Total	3 869 219	45	11.6 (8.7, 15.6)

*Incidence rate per 1 000 000 person years.

of ocular melanoma among glaucoma patients compared with the general population was 0 (95% CI 0, 2.9).

Discussion

In our study we estimated the incidence rate of ocular melanoma to be about 11 per 1 000 000 person years. This incidence is in the range reported by other authors¹⁻⁷ and actually slightly greater. This finding would exclude any major underascertainment of ocular melanoma in our study. Also, we found a major increased risk with old age as previously described.⁴ We did not find any case of ocular melanoma in the glaucoma population. Based on these results, it

can be ruled out with confidence an incidence rate greater than 30 per 1 000 000 person years in the glaucoma population. In summary, we did not find a major increased risk of ocular melanoma associated with glaucoma.

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Conflicts of interest: none.

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