

Ultraviolet Sun Radiation and Incidence of Age-Related Macular Degeneration on Croatian Island Rab

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ABSTRACT

This epidemiological study is completed on island Rab, located in North Adriatic Sea. For this study it is important that Adriatic Sea has one of the highest solar radiations in geographical area of Europe. The aim of this epidemiological study is to estimate correlation between incidence of Age-Related Macular Degeneration (AMD) and exposure of sunlight in two different populations on island Rab. In the first group of population of island Rab, agriculturists and fishermen (n=1300), incidence of AMD was in 18%, but in urban population only 2.5%. It is very interesting that correlation exists between incidence of AMD and exfoliation syndrome. In the group of chronic exposure to sunlight (agriculturists and fishermen) exfoliation syndrome exists in 28%, but in urban population it has never been seen. The age in both populations was 45–65 years. We can conclude that there is a very significant correlation between chronic exposure to sunlight and appearance of AMD.

Key words: AMD, exfoliation syndrome, exposure to sunlight

Introduction

Through a long period of time it is estimated that environment is very significant risk factor in development of Age-Related Macular Degeneration (AMD)^{1–7}. One of the most important climate factors in development of AMD is increase of solar UV-radiation^{8–10}. AMD is today leading factor of vision loss in the world^{11,12}. Ultraviolet light radiation with very high energy can lead to very serious damage, initiate deleterious biochemical reactions, to make photoproduct dimmers, damage nucleic acids and consequently formed abnormal DNA^{13,15}. Beside influence on development of AMD, solar UV-radiation can also initiate as a risk factor even in development of ocular melanoma¹⁶. Histopathological alterations are mostly known in AMD^{7,17}, but the future of solving a problem of AMD is in the proteomic analysis^{18,19}.

The aim of this epidemiological analysis is to estimate the influence of solar UV radiation as a risk factor in development of AMD on the island of Rab.

Patients and Methods

The island of Rab is geographically located in North of the Adriatic Sea (44°40' N), with very high solar radiation. All patients (n=1371) were divided in two groups: population of agriculturists and fishermen (n=1300) and urban population (n=71). Their age was between 45 and 65 years. All patients were examined in mydriasis with slit lamp-biomicroscopy, eye pressure and fundus picture. This epidemiologic study is completed between the years 2003 and 2005. Each patient was taken a very serious anamnesis and style of life questions.

Results and Conclusion

In table 1, incidence of AMD is presented in two distinct groups: in the first group of agriculturists and fishermen population AMD is present in 18%, but in urban population in only 2.5% (2 patients only). Correlation be-

TABLE 1
THE APPEARANCE OF AGE-RELATED MACULAR DEGENERATION (AMD) ON THE ISLAND OF RAB IN POPULATION OF CHRONIC EXPOSURE TO UV-RADIATION (N=1371 PATIENTS, AGE 45–65 YEARS)

Agriculturists and fishermen population (n=1300)	Urban population (n=71)
A. Central vision loss in 21 % 0.7–0.8	Central vision loss in 4% 0.9–1.0
B. Macular Thresholds increasing 20–50 asb, in 27%	5–10 asb, in 6%
C. Pseudoexfoliation of lens capsule (possible glaucoma exists) in 28%	0.0%
D. Fundus picture: AMD 18%	AMD in 2.5%

tween the appearance of AMD and exfoliation syndrome is very significant, 28% in the first group of agriculturists and fishermen population.

In this epidemiological study, it can be concluded that the appearance of AMD is significantly in correlation with chronic exposure to sunlight UV-radiation.

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ULTRAVIOLETNO SUNČEVO ZRAČENJE I UČESTALOST POJAVE SENILNE MAKULARNE DEGENERACIJE U POPULACIJI PUČANSTVA OTOKA RABA

SAŽETAK

U vremenskom periodu od 2003–2005. godine pregledana je 1371 osoba na otoku Rabu. Populacija je podijeljena u dvije skupine: poljoprivrednici i ribari (1300 osoba) i u drugoj skupini urbano stanovništvo (71 osoba). U prvoj skupini pregledom fundusa dijagnosticirana je u 18% AMD, početnog i srednjeg stupnja, dok je u urbanoj skupini dijagnosticirana AMD blažeg stupnja samo u 2.5%, tj. samo u dva pacijenta. U sličnoj je korelaciji i pojava ekfolijativnog sindroma, s mnogo višom incidencijom AMD u pacijenata s ekfolijativnim sindromom. Detaljnom anamnezom i poznavanjem stila života svakog pojedinca, može se zaključiti da je tako niska incidencija AMD i ekfolijativnog sindroma u urbanoj populaciji prisutna stoga što to stanovništvo živi u gradu s uskim ulicama i posljedično u velikoj hladovini, a kod sunčanja obavezno koriste zaštitne naočale i sunčani šešir.