

ETIOLOGY OF UVEITIS IN RURAL AND URBAN AREAS OF MID-EASTERN POLAND

Barbara Biziorek¹, Jerzy Mackiewicz¹, Zbigniew Zagórski¹,
Lesław Krwawicz², Dariusz Haszcz¹

¹1st Department of Ophthalmology, Medical Academy, Lublin, Poland

²District Ophthalmic Hospital, Kielce, Poland

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Abstract: The aim of this study was to assess and compare the frequencies of uveitis etiology in inhabitants of rural and urban areas of mid-eastern Poland. We reviewed the cases of 563 patients (263 males, 300 females; aged 2–87) with uveitis, treated at the 1st Department of Ophthalmology at the Medical Academy in Lublin and at the District Ophthalmic Hospital in Kielce, Poland, from January 1996–December 2000. Anatomical classification of uveitis was used according to the International Uveitis Study Group and etiological classification including uveitis associated with trauma, infection, systemic disease, non-associated with a systemic disease and masquerade syndromes. Data regarding age, gender, place of residence, anatomical location and etiology of uveitis were obtained. Statistical analyses were performed using Pearson's chi-square test, Spearman's rank correlation test and logistic regression. Etiology of uveitis was established in 70.0% of cases. The most common cause of uveitis was infection. Patients from rural areas were significantly more likely to have uveitis of infectious origin whereas patients from urban areas significantly more likely to have uveitis associated with a systemic disease. In conclusion, the pattern of uveitis in mid-eastern Poland confirms the influence of environmental factors on the etiology of this heterogeneous disease.

Address for correspondence: Barbara Biziorek, MD, I Klinika Okulistyki AM, ul. Chmielna 1, 20-079 Lublin, Poland. E-mail: biziorek@panaceum.am.lublin.pl

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INTRODUCTION

The term "uveitis" encompasses a wide range of intraocular inflammatory disorders primarily or secondarily involving iris, ciliary body or choroid. In 1987, the International Uveitis Study Group introduced the anatomical classification of uveitis, including anterior uveitis (iritis, iridocyclitis), intermediate uveitis (inflammation of peripheral retina and pars plana of the ciliary body), posterior uveitis (choroiditis, chorioretinitis) and panuveitis (generalised inflammation of the whole uvea) [1]. Etiology of uveitis may be associated with trauma, infection, systemic disease, non-associated with a systemic disease

or inflammation, and may represent a masquerade syndrome. The differential diagnosis of uveitis is very extensive and influenced by genetic, environmental and geographic factors as well as by prevalence of infectious diseases in a region, diagnostic criteria and methodology.

Knowledge of the frequency and pattern of uveitis in a given population is important for proper diagnosis and management. This is all the more significant because uveitis accounts for 5–20% of legal blindness in Europe and the United States [8].

We conducted a prospective study to assess and compare the frequencies of uveitis etiologies in patients from rural and urban areas of mid-eastern Poland.

Table 1. Etiology of uveitis in patients from rural and urban areas.

Etiology	Traumatic N = 20 (3.5%)*	Infectious N = 214 (38.0%)	Associated with a systemic disease N = 127 (22.6%)	Non-associated with a systemic disease N = 198 (35.2%)	Masquerade syndrome N = 4 (0.7%)
Rural areas	9 (1.6%)*	112 (19.9%)	35 (6.2%)	70 (12.4%)	2 (0.35%)
Urban areas	11 (1.9%)	102 (18.1%)	92 (16.4%)	128 (22.8%)	2 (0.35%)

* Percent of total patients (N = 563).

Table 2. Results of statistical analysis for each etiologic group of uveitis in patients from rural and urban areas.

Etiology	Traumatic	Infectious	Associated with a systemic disease	Non-associated with a systemic disease
p	n.s.	<0.001	0.001	n.s.
r _s		0.19	0.13	

p: p-value; r_s: Spearman's rank correlation coefficient; n.s.: not significant.

MATERIALS AND METHODS

The study included 563 consecutive patients with uveitis, treated at the 1st Department of Ophthalmology at Medical Academy in Lublin and at District Ophthalmic Hospital in Kielce, Poland, from January 1996–December 2000. We used anatomical classification of uveitis according to the International Uveitis Study Group and etiological classification comprising uveitis associated with trauma, infection, systemic disease, non-associated with a systemic disease and masquerade syndromes. The diagnosis was based on detailed ophthalmic and physical examination, medical, family and social history, and on targeted laboratory tests, ordered depending on clinical indications. Data regarding age, gender, place of residence, anatomical location and etiology of uveitis were obtained. Statistical analyses aimed at finding an association between etiology of uveitis and place of residence were performed using Pearson's chi-square test, Spearman's rank correlation test, and logistic regression for each etiologic group of uveitis, except for masquerade syndrome because of the small number of cases.

RESULTS

Among 563 patients, 300 (53.3%) were females and 263 (46.7%) males. The mean age at the onset of uveitis was 40.4 (range: 2–87 years). 335 (59.5%) patients lived in urban areas and 228 (40.5%) in rural areas. Anterior uveitis was the most common form, accounting for 44.6% of all patients, followed by posterior uveitis (33.0%), panuveitis (15.1%) and intermediate uveitis (7.3%).

Etiology was established in 70.0% of cases. The most frequent cause of uveitis was infection, accounting for

38.0% of patients. Uveitis was non-associated with a systemic disease in 35.2%, associated with a systemic disease in 22.6%, traumatic in 3.5% and represented a masquerade syndrome in 0.7% of all cases (Tab. 1).

The etiology of anterior uveitis was associated most often with a systemic disease (39.8%) such as ankylosing spondylitis, Reiter's syndrome, psoriasis, Crohn's disease, ulcerative colitis, nonspecific arthropathy with the presence of HLA-B27, juvenile chronic arthritis and rheumatoid arthritis. 15.5% of anterior uveitis cases were of infectious origin such as herpes simplex virus, herpes zoster virus, borreliosis, tuberculosis and streptococcal infection. Non-penetrating ocular trauma was the cause of 7.6% of anterior uveitis. 37.1% of cases of anterior uveitis non-associated with a systemic disease were represented by Fuchs syndrome and idiopathic cases.

No causative diagnosis could be determined in 73.2% of patients with intermediate uveitis. 24.4% of cases of this type of uveitis were associated with a systemic disease such as multiple sclerosis, sarcoidosis, ankylosing spondylitis, Reiter's syndrome and glomerulonephritis. Borreliosis was diagnosed in one case (2.4%) of intermediate uveitis.

Infection accounted for 67.2% of posterior uveitis. The most frequent cause was toxoplasmosis, followed by toxocariasis, Coxsackievirus B infection, streptococcal infection, tuberculosis, borreliosis and rubeola. 5.4% of cases of posterior uveitis were associated with a systemic disease, such as sarcoidosis, chronic granulomatous disease, systemic lupus erythematosus and primary Sjögren syndrome. 26.3% of posterior uveitis cases non-associated with a systemic disease included punctate inner choroidopathy and uveitis of unknown etiology. Masquerade syndrome (retinitis pigmentosa) was diagnosed in 1.1% of posterior uveitis.

Panuveitis was caused by infection in 57.6% of cases. The most frequent diagnosis was toxocariasis, followed by toxoplasmosis, Coxsackievirus B infection, candidiasis, borreliosis, herpes zoster virus infection, streptococcal infection, aspergillosis and actinomycosis. 8.2% of panuveitis cases were associated with a systemic disease such as rheumatoid arthritis, systemic lupus erythematosus, nonspecific arthropathy with the presence of HLA-B27 and Zinsser-Engman-Cole syndrome. Sympathetic ophthalmia, multifocal choroiditis with panuveitis and idiopathic cases accounted for 30.6% of panuveitis non-associated with a systemic disease. Non-penetrating ocular trauma was responsible for 1.2% and masquerade syndrome (malignant melanoma, intraocular foreign body) for 2.4% of panuveitis.

No statistical significance was found for age and gender for any etiologic group of uveitis.

Patients from rural areas were significantly more likely to have uveitis of infectious origin ($p < 0.001$; Spearman's rank correlation coefficient = 0.19; OR = 2.23; 95% CI = 1.57–3.16) than patients from urban areas. Patients from urban areas were significantly more likely to have uveitis associated with a systemic disease ($p < 0.001$; Spearman's rank correlation coefficient = 0.13; OR = 1.92; 95% CI = 1.10–3.38) (Tab. 2).

DISCUSSION

The search for etiologic factors of uveitis is one of the most important subjects in modern ophthalmology. Wide interdisciplinary cooperation is crucial for proper management in patients with uveitis. It is generally agreed that extensive and indiscriminate laboratory testing is inappropriate and very costly. A targeted approach to diagnosis is universally recommended by uveitis specialists.

In our prospective study of 563 patients with uveitis diagnosis was established in 70.0% of cases. Our findings were comparable to those of reports published during the last 10 years concerning the frequency of anatomical location and etiology of uveitis in Europe and the United States [3, 4, 6, 7, 10].

Little information has been published about the differences of uveitis etiologies in patients from rural and urban areas. Perkins and Folk [5] founded that the pattern of uveitis seen in a rural population in Iowa was very similar to that seen in an urban population in London in spite of geographical and climatic differences. Saari *et al.* [9] studied the case records of 1,122 patients with

endogenous uveitis in south-western Finland and observed that the incidence of uveitis was higher in the lower socio-economic group.

In our material, the most common cause of uveitis was infection, and particularly parasitic infection such as toxoplasmosis and toxocariasis. Persons from rural areas are known to be more exposed to infection because of their contact with animals and contaminated soil. Zwoliński [11] assessed the risk factors of *Toxocara canis* infestation among a population from the Lublin region and observed that rural inhabitants were significantly more likely to become infected than inhabitants of Lublin city and small towns. On the other hand, Gundlach *et al.* [2] found no difference in the degree of contamination by *Toxocara* spp. eggs between urban and rural environments in the same region.

Our study reflects the demographic and causative pattern of uveitis in mid-eastern Poland and confirms the influence of environmental factors on the etiology of this heterogenous disease.

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