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Primary acquired nasolacrimal duct obstruction: epidemiological analysis of 91 patients

Primarna stečena opstrukcija nazolakrimalnog kanala: epidemiološka analiza 91 bolesnika

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Summary

Aim. To investigate the epidemiological characteristics of primary acquired nasolacrimal duct obstruction (PANDO).

Method. The study was a retrospective view of medical records of inpatients and outpatients who developed PANDO during a 10-year study period from 1994-2003 in Split-Dalmatian County managed at the Eye Clinic of Split University Hospital. The total number of patients was 91.

Result. The annual incidence of PANDO was 1.96 per 100,000 inhabitants. The mean age ± SD of patients was 64.3 ± 16.0 years. There were 67 (73.6%) females and 24 (28.4%) males. The female to male ratio was 2.8, the difference was statistically significant (p = 0.000007). The differences in occurence were not statistically significant (p = 0.46) and a bilateral involvement was observed in 6 (6.6%) cases. An acute form of PANDO occured in 50 (54.9%) of cases, and a chronic form in 41 (45.1%) of cases. Although prevalence of an acute form of PANDO was a little greater in warmer seasons (spring and summer) than in colder seasons (autumn and winter), the seasonal variations in the occurrence of PANDO were statistically not significant (p = 0.26).

Conclusion. The findings of this study are important because they make possible a better disease evaluation and better ophthalmological service planning in the treatment of PANDO.

Key words: primary acquired nasolacrimal duct obstruction, epidemiology

Sažetak

Cilj. Istražiti epidemiološke značajke primarne stečene opstrukcije nazolakrimalnog kanala (PSONK).

Metoda. Ova retrospektivna studija daje pregled hospitaliziranih i ambulantnih bolesnika s PSONK-om tijekom razdoblja od 10 godina, tj. od 1994. do 2003. godine u Splitsko-dalmatinskoj županiji, liječenih na Klinici za očne bolesti Kliničke bolnice Split. Ukupan broj bolesnika bio je 91.

Rezultat. Godišnja incidencija PSONK-a bila je 1,96 na 100000 stanovnika. Prosječna dob ± SD bolesnika bila je 64,3 ± 16,0 godina. Bilo je 67 (73,6%) žena i 24 (28,4%) muškaraca. Odnos žena prema muškarcima bio je 2,8, što je statistički značajna razlika (p = 0,000007). Razlike u pojavi bolesti između desne i lijeve strane nisu statistički značajne (p = 0,64), a bilateralna pojava je primijećena u 6 (6,6%) slučajeva. Akutni oblik PSONK-a javio se u 50 (54,9%) slučajeva, a kronični oblik u 41 (45,1%) slučaju. Iako je prevalencija akutnog oblika PSONK-a nešto veća u toplijim godišnjim dobima (proljeće i ljeto), nego u hladnijim (jesen i zima), sezonske varijacije u pojavi PSONK-a nisu statistički značajne (p = 0,26).

Zaključak. Rezultati ove studije su važni jer omogućavaju bolju evaluaciju bolesti i bolje planiranje oftalmološke službe u liječenju PSONK-a..

Ključne riječi: primarna stečena opstrukcija nazolakrimalnog kanala, epidemiologija

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Introduction

Inflammation of the lacrimal sac (dacryocystitis) results from stasis of tears in the lacrimal drainage system and secondary infection mostly by bacteria.

It may be present in infancy (congenital nasolacrimal duct obstruction), offering 2% to 6% of live births or may be an acquired condition[1-4]. The cause of congenital dacryocystitis usually is the non-obliterated valve of Hasner. More than 90% infants are reported to outgrow the problem by the first year of life.[5,6]

The cause of acquired lacrimal drainage obstruction may be primary or secondary. The primary acquired nasolacrimal duct obstruction (PANDO), the theme of this report, results from inflammation of unknown cause that eventually leads to occlusive fibrosis of the nasolacrimal duct or is a result of involutional stenosis of the nasolacrimal duct in the elderly.[5,6] The incidence of significant pathology of the lacrimal sac in clinically suspected PANDO is low, only 2-3%.[7,8] Bernandini et al. recommend that lacrimal sac biopsy in patients undergoing dacryocystorhinostomy should be performed only in those with a positive history for systemic disease or an abnormal appearing sac during surgery.[8]

Secondary acquired lacrimal drainage obstruction (SALDO) is mostly caused by chronic sinus disease, naso-orbital trauma, rarely as a result of neoplastic involvement or secondary to incurable pediatric dacryocystitis.

Acquired dacryocystitis may be acute or chronic. Acute dacryocystitis is presented with painful enlargement of the lacrimal sac and redness in the medial canthal angle. If not treated, spontaneous rupture and drainage through the skin is common. Chronic dacryocutaneous fistula may result. Acute dacryocystitis is mostly superimposed on the chronic condition.

Chronic dacryocystitis is characterized by recurrent episodes of epiphora or mucopurulent discharge, often associated with a nontender fullness below the medial canthal tendon.

According to available literature there was no precise study about incidence and other epidemiological characteristics of PANDO. There were also none from Croatia.

The aim of this paper is the epidemiological analysis of PANDO according to sex, age, laterality, incidence, frequency of acute and chronic forms of the disease and seasonal variations of acute form of PANDO.

Patients and Methods

There is a rare opportunity to study PANDO epidemiologic characteristics in a defined population like in Split-Dalmatia County because practically all PANDO cases are managed at the Eye Clinic of Split University Hospital. Only county residence patients were included in the study (Picture 1). The study was designed as a retrospective review of the medical records of inpatients and outpatients who developed PANDO during a 10-year study period from 1994 to 2003. The total number of patients in this report is 91. Six patients (6.6%) had PANDO on both sides during the same time period. In this study we excluded 18 patients with SALDO (3 caused by incurable dacryocystitis in infants, 4 as a consequence of facial fracture, and 11 caused by chronic sinus disease).

Picture 1. Geographical position of Split-Dalmatia County, where the examination was performed
Slika 1. Zemljopisni položaj Splitsko-dalmatinske županije – područja na kojem je rađeno istraživanje

Data on the Split-Dalmatia County population was derived from the 2001 Croatia census[9] (Table 1). We analysed seasonal incidence of acute form of PANDO. The following data were collected for this report: permanent place of residence, age and sex of each patient, hospital admittance data, eye-side (right or left) involved, bilaterality and seasonal variations of acute form of PANDO.

The diagnosis of PANDO is established by medical history, characteristic clinical picture, fluorescein dye test, difficult or impossible irrigation of lacrimal drainage system, contrast dacryocystography, radiography for orbital and paranasal sinuses evaluation and otorhinolaryngologic examination.

Table 1. Age related annual incidences of primary acquired nasolacrimal duct obstruction in Split-Dalmatia County, 1994-2003
Tablica 1. Godišnje pojave primarne stečene opstrukcije nazolakrimalnog kanala u odnosu na dob u Splitsko-dalmatinskoj županiji od 1994. do 2003. godine

Age (yrs.) / *Godine*	Inhabitants *(n) / *Broj stanovnika*	Incidence rate ** / *Omjer pojava*
0-9	56	0.0
10-19	63	0.0
20-29	66	0.6
30-39	64	0.6
40-49	69	1.2
50-59	53	1.5
60-69	49	4.7
70-79	32	9.4
80-89	9	10.0
> 90	2	25.0
Total / *Sveukupno*	463	1.96

* Thousands / *Tisuće* ** Number per 100,000 inhabitants */ Broj na 100.000 stanovnika*

Statistical Analysis

Results are presented as mean ± standard deviation (SD). Statistical analysis was performed by use of chi-square test. P value < 0.05 was considered statistically significant.

Results

During the 10-year period (1994-2003), patients with PANDO were recorded, yielding an annual incidence of 1.96 (range 0.0-25.0) per 100,000 inhabitants in Split-Dalmatia County with a population of 463 thousand. The mean frequency of PANDO was 9.1 per year. The highest incidence found for PANDO in our survey was in the over 90-year age group (25.0 per 100,000).

The mean age ± SD of patients was 64.3 ± 16.0 years, 61.3 ± 16.2 years for men and 65.4 ± 15.9 years for women. The gender differences in age were not statistically significant (p < 0.001). The youngest patient was 22, and the oldest 94 years of age. 74% patients with PANDO were more than 60 years old.

There were 67 (73.6%) females and 24 (28.4%) males. The female to male ratio was 2.8, the difference was statistically significant (p = 0.000007).

PANDO occurred slightly more often on the left side than the right, yielding a rate of 1.2. The left side was affected in 49 cases (53.8%) and the right side in 42 cases (46.2%). The site differences were not statistically significant (p = 0.46). Bilateral involvement was observed in 6 (6.6%) cases. In this examination an acute form of PANDO occured in 50 (54.9%) cases and a chronic form in 41 (45.1%) of cases (Table 2).

The 10-year cumulative number of acute form of PANDO recorded per season was 12 in winter, 14 in spring, 15 in summer and 9 in autumn. Although the prevalence of acute PANDO was a little greater in warmer seasons (spring and summer) than in colder seasons (autumn and winter), the seasonal variations in the occurrence of PANDO were statistically not significant (p = 0.26).

Discussion

The annual incidence of PANDO was 1.96 per 100,000 inhabitants. Assuming that an incidence similar to that found in the present study is representative of the population of Croatia, there should be approximately 100 cases of PANDO in the country per year. Generally the frequency of PANDO in population is 1: 50,000 people. It is probably a little more higher because patients with weaker degrees of illness are not treated.

Advanced in years of life, the incidence of PANDO increases because of involutional processes i.e. stenosis of the nasolacrimal duct.

Negroid races have a lower rate of illness than Caucasians. It is the consequence of the form of the skull, facial bones and nose. Namely, the members of Negroid races have wider, shorter and less curved lacrimal paths.[10]

PANDO was almost three times as common in females than in males (2.8 : 1) similar as in the works of Čupak (75% : 25%) and Massaro and Tabbara.[11,12] In the work of Lee-Wing and Ashenhurst in Canada 71% of patients were females and 29% of patients were males.[13] Badhu et al. found 67.6% females of 662 patients with chronic dacryocystitis in Nepal.[14]

Table 2. Epidemiologic characteristics of 91 patients with primary acquired nasolacrimal duct obstruction included in this study
Tablica 2. Epidemiološke značajke 91 bolesnika s primarnom stečenom opstrukcijom nazolakrimalnog kanala uključenih u ovu studiju

Characteristics *Osobine*		Value *Vrijednost*
Incidence* *Pojava*		1.96 (range 0.0 - 25.0)
Age, years *Godine*	Mean ± SD *Prosjek*	64.3 ± 16.0
	Men *Muškarci*	61.3 ± 16.2
	Women *Žene*	65.4 ± 15.9
Sex *Spol*	Men *Muškarci*	24 (26.4%)
	Women *Žene*	67 (73.6%)
Side involved *Obuhvaćena strana*	Right *Desna*	42 (46.2%)
	Left *Lijeva*	49 (53.8%)
Bilaterality *Obostranost*		6 (6.6%)
Form of PANDO *Oblik PSONK-a*	Acute *Akutni*	50 (54.9%)
	Chronic *Kronični*	41 (45.1%)

* Cases per 100,000 population per year / *Godišnjih slučajeva na 100.000 stanovnika*

The natural difference in length and width of the lacrimonasal duct bone part has an essential importance on the high rate of illness in women.[15-17]

PANDO is usually unilateral in nature, and bilaterality is rare (6.6%). The study of Zapala and associates in Poland revealed bilaterality in 6.0% of patients with obstruction of the naso-lacrimal duct.[18] Both sides are equally involved, probably because no significant difference in bony diameter was found between the right and left side at any level of bony NLD.[16] In our study, the main age of patients was 64.3, similar to the paper of Lee-Wing and Ashenhurst, i.e. 60.7 years old.[13] Although PANDO in Split-Dalmatia County residents was found to occur more often on the left than on the right side (53.8% and 46.2%, respectively), the difference was not statistically significant in contrast to Friedmann et al. who found that the right side is to be involved in insignificantly more cases than the left one.[19] The inflammation of the lacrimal sac occurs equally on the right and left side.

PANDO has seemingly more often an appearance in acute form because of violent symptoms. We expected an acute form of PANDO appearance to be more common in the warmer months (spring and summer) because of a greater tendency to infections, but the statistical difference was insignificant. Badhu et al. found that chronic dacryocystitis is more common in the subtropical plains of Nepal with a monsoon climate (87%) than in the high hills (13%).[14]

PANDO usually occurs in the elderly especially in postmenopausal women. The 60 years and older age group accounted for 74% of all cases.

Epidemiological characteristics of PANDO like age, gender, bilaterality in our study are similar to those of few previous reports among Caucasians.[13,14,18]

The findings of this study are important because they make a better disease evaluation possible and better planning of ophthalmological service in the treatment of PANDO.

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