

Seasonal Variation in Acute Dacriocystitis

Elif Ertan Baydemir¹, Sibel İnan², Ümit Übeyt İnan³, İsmet Doğan⁴

¹University of Health Sciences Turkey, Başakşehir Çam and Sakura City Hospital, Clinic of Ophthalmology, İstanbul, Turkey

²Private Karşıyaka Göz Hospital, Clinic of Ophthalmology, İzmir, Turkey

³Private İzmir Can Hospital, Clinic of Ophthalmology, İzmir, Turkey

⁴Afyon Health Science University, Department of Biostatistics, Afyonkarahisar, Turkey

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ABSTRACT

Objective: We aimed to investigate whether there is a seasonal relationship between the emergence of acute dacryocystitis.

Methods: The files of patients who applied to the ophthalmology outpatient clinic with complaints of tearing and discharge for five years and were diagnosed with acute dacryocystitis were retrospectively analyzed. Age, gender, date of occurrence of the complaints, and date of diagnosis of acute dacryocystitis were recorded. To determine the seasonal relationship, the data regarding the number of cases who applied every month of the year were analyzed statistically by Rayleigh test.

Results: The mean age of 60 patients (45 females, 15 males) included in the study was 54.70 ± 16.80 years. It was found that all patients were not equally likely to be admitted to the hospital and the onset of their complaints throughout the months of the year ($p < 0.05$). The frequency of applications was higher between May and August.

Conclusion: There appears to be a seasonal relationship with the timing of acute dacryocystitis. In our series, more acute dacryocystitis cases were encountered during the first spring-summer months. The reason for the increase in acute dacryocystitis cases in the hot seasons of the year may be the increase in infectious agents in these seasons.

Keywords: Acute dacryocystitis, seasons, gender

ORCID IDs of the authors: E.E.B. 0000-0001-5147-9814; S.İ. 0000-0003-2797-5732; Ü.Ü.İ. 0000-0001-7603-4440; İ.D. 0009-0004-0589-5373.



Corresponding Author: Elif Ertan Baydemir,

E-mail: elif-ertan@hotmail.com



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INTRODUCTION

Dacryocystitis is an acute suppurative inflammation of the lacrimal sac. Generally, the clinical picture develops because of infection in the lacrimal sac secondary to obstruction of the nasolacrimal duct. Pain, edema, and erythema are observed together with lacrimal sac distension (1,2). Dacryocystitis can be congenital or acquired. Acquired dacryocystitis is frequently seen at the age of 40 years. The cause of the nasolacrimal duct obstruction is not fully known. It has been suggested that various factors such as the anatomical structure of the nasolacrimal canal (unilateral nasolacrimal obstruction with facial asymmetry or nasal septal deviation), endocrine changes, climatic factors, infections, and smoking may play a role in the development of obstruction (1-3). In acute dacryocystitis, the agent is usually Gram (+) bacteria. These are usually *Streptococcal pneumococci* and *Staphylococci* (4).

Some medical diseases can be seen more in certain seasons of the year. It has been wondered whether there is a seasonal effect in the occurrence time of some diseases. Seasonal changes in the clinical symptoms of a disease indicate environmental effects. Observing the seasonal effect also gives an idea of the pathogenesis. This information may also gain importance in the development of preventive health services. Seasonal changes have been reported in various infectious and surgical diseases (5-7). In this retrospective data review study, we aimed to examine the seasonal variation in acute dacryocystitis among patients admitted to our hospital.

METHODS

The Afyonkarahisar Health Sciences University Clinical Research Ethics Committee approved the study (committee code: 2011-KAEK-2, meeting no: 2021/4, date: 02.04.2021). In this study, the files of the patients were retrospectively reviewed after the approval of the ethics committee was obtained in accordance with the tenets of the Declaration of Helsinki. The files of patients who applied to the eye outpatient clinic of the private hospital with complaints of tear and discharge and were diagnosed with acute dacryocystitis were retrospectively analyzed. Best corrected visual acuity, intraocular pressure measurement, and full slit-lamp examination were performed on all patients, and the results were recorded. All patients were treated with topical and systemic antibiotics. Age, gender, date of occurrence of the complaints, and date of diagnosis of acute dacryocystitis were recorded. In particular, the time of onset of the patients' acute complaints was questioned and the month in which they occurred was recorded. Further analysis of the case series was excluded because it was beyond the scope of this study. Seasons -summer, winter, fall, and spring- were defined according to internationally recognized astronomical seasons based on solstices and equinoxes and taking leap years into consideration. In our country, December, January, February are winter, March, April, May are spring, June, July, August are summer, and September, October, and November are fall.

Statistical Analysis

Descriptive statistics used in the study are expressed as mean $\pm$ standard deviation, number (n), and percentage (%). A Statistical Package for the Social Sciences (SPSS Inc., version 22.0, Chicago, IL, USA) was used for data analysis. A value of $p < 0.05$ was taken as the statistical significance criterion. Data were analyzed using the Rayleigh test.

RESULTS

The mean age of 60 patients (45 females, 15 males) included in the study was 54.70 ± 16.80 . The mean age of the male patients was 43.67 ± 17.17 . The mean age of the female patients was 58.38 ± 15.14 . The ratio of female/male patients was 3/1. Rayleigh test analysis showed that patients' admission times to the hospital was unevenly distributed over months. The number of patients with symptoms and signs of acute dacryocystitis seen in each month of the year was significantly different ($p < 0.05$). The frequency of applications was particularly high between May and August. The distributions are shown in Figure 1. The distribution of hospital admissions and the onset of complaints by months of the year was analyzed in terms of gender. It was determined that female patients' admission to the hospital and the onset of their complaints were not equally distributed over the months of the year. The difference in the number of female cases with acute dacryocystitis between months was statistically significant ($p < 0.05$). The frequency of admission was higher between May and August. It was observed that male patients' admission to the hospital and the onset of their complaints were equally distributed over the months of the year, and there was no statistical difference among the months ($p > 0.05$). The distribution of hospital admissions and the onset of complaints of female and male patients by months of the year are shown separately in Figure 2 and 3, respectively.

DISCUSSION

In our study, when we analyzed the monthly distribution of patients admitted to our hospital with acute dacryocystitis symptoms for five years, we obtained data indicating that the development of acute dacryocystitis may have a seasonal relationship. In our series, the average age was younger than that in western countries. Patients

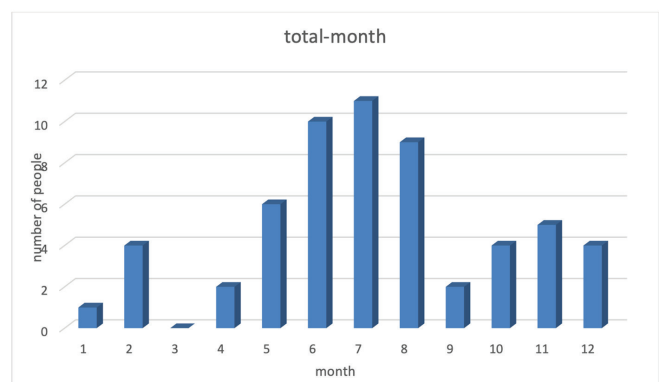


Figure 1. The frequency of applications, total

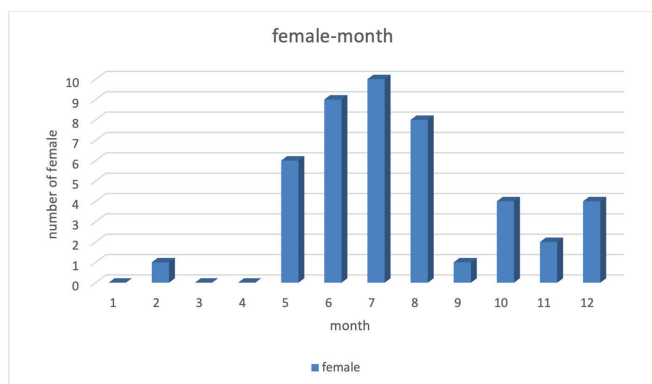


Figure 2. The frequency of applications, female

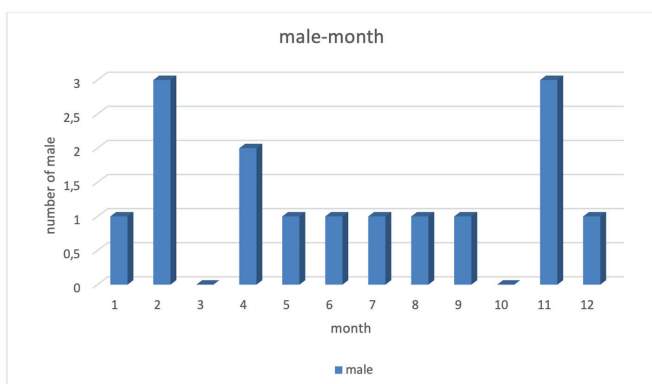


Figure 3. The frequency of applications, male

who have dacryocystitis are diagnosed generally at the age of 40 and over. However, acquired nasolacrimal duct obstruction has been diagnosed in the advanced age group (mean between 55.0 and 66.3 years) in developed countries (8). In our study, the mean age of the patients was 54.70 ± 16.80 years.

In the study by Chung et al. (9), the age of the patients was found to be 55.4 years, similar to our study. The number of female patients was higher than that of men. In this study, *Staphylococcus aureus* was found to be the most frequently isolated microbiological agent in the culture results (9). When dacryocystitis cases are examined in terms of gender, while the distribution between genders is equal in congenital dacryocystitis cases, dacryocystitis seen in adulthood is more common in women. This ratio is observed to be 80% women and 20% men. Various studies have reported that hormonal irregularities in women may cause narrowing of the nasolacrimal canal, causing dacryocystitis to be observed more frequently. In addition, the lower lacrimal passage is more irregular in women (10,11). In our study, the rate of female patients in a series of 60 patients included in the study was 75%. Studies conducted in our country have reported the rate of women being between 71.2% and 89.3% (12,13).

Despite the differences in various economic and environmental factors, the fact that nasolacrimal obstruction occurs more frequently in women and in the postmenopausal period suggests

that anatomical and hormonal factors play an important role (14,15). When nasolacrimal duct obstruction develops, patients usually develop low-grade chronic dacryocystitis, which is exacerbated from time to time. Patients usually live with these symptoms of chronic dacryocystitis until they undergo surgery for nasolacrimal duct obstruction. The patients have symptoms of permanent epiphora and purulent discharge due to recurrent conjunctivitis from time to time. These cases develop acute dacryocystitis due to acute inflammation of the lacrimal sac at a certain time of the year. When acute dacryocystitis develops, a very disturbing clinical picture with subacute onset of pain, tense swelling at the medial canthus, and mild to intense preseptal cellulitis develops in these patients, and systemic antibiotic treatment is often required. Some patients are persuaded to undergo surgery after experiencing acute dacryocystitis. It is very difficult to predict when acute dacryocystitis will develop in these patients. A seasonal relationship with the time of onset of acute dacryocystitis may indicate the influence of other environmental factors. Whether there is a seasonal relationship with acute dacryocystitis has rarely been investigated.

In an epidemiological study on acute dacryocystitis, the seasonal variation analysis of acute dacryocystitis cases showed that dacryocystitis was relatively more common during warm periods, but the difference was not statistically significant. Seasonal distribution analysis was not performed between genders (16).

In our study, it was observed that there was an increase in the frequency of acute dacryocystitis during the hot season among all patients. This difference was statistically significant among women ($p < 0.05$). No significant difference was found between male patients in terms of seasonal distribution by months of the year ($p > 0.05$).

Badhu et al. (17) showed that dacryocystitis was observed at a higher rate in patients with nasolacrimal duct obstruction living in the plains than in those living in the mountainous region from their sociodemographic data. These geographic data may show that temperature is a risk factor and are consistent with the results of our study. In a retrospective study on the sociodemographic data by Nemet and Vinker (18), it was found that 36.3% of the patients with nasolacrimal obstruction had a low socioeconomic level, but this rate was not found to be significantly different from the control group. In our study, no evaluation could be made regarding socioeconomic level or geographical location.

Study Limitations

Our study has some limitations. The small number of patients is one of them. The second limitation may be the lack of microbiological culture data to analyze the microbiological factors causing dacryocystitis according to seasons. Third, anatomical variations in the patients were not examined by endoscopic examination. In our study, it was not attempted to reach these data accurately retrospectively, but rather we exerted the effort to find data about when the patients developed symptoms. More detailed results can be obtained by examining these features in a larger case series.

The seasonal relationship between the time of occurrence of acute dacryocystitis cases and the fact that there is an increase in the warm seasons, especially in female patients, but the absence of seasonal relationship in male patients suggests that different factors may play a role in the etiology of acute dacryocystitis. Our study should be investigated with further studies, especially considering the small sample size of male patients. If this relationship is validated by further studies, patients with chronic epiphora or chronic dacryocystitis can be informed and warned about the seasonal risk factors of this very disturbing clinical picture, and thus disease management can be performed more accurately.

CONCLUSION

In conclusion, we considered that the increase in the frequency of acute dacryocystitis cases in summer may be due to the change in lacrimal sac flora or increase in infectious agents in these seasons. Further studies are warranted to demonstrate the seasonal relationship of the development of acute dacryocystitis.

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