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Short Communication

Review on corneal perforation among mentally disabled patients in a tertiary center in Melaka, Malaysia

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ABSTRACT

Corneal perforation is an ocular emergency arising from various causes of infectious and non-infectious disease. Its management could range from temporising measures to various surgical intervention. This study was done to evaluate the causes and management of corneal perforation among mentally disabled patients in Melaka. Retrospective review was done using the ward admission records from 2019 to 2022. Data gathered from cases with corneal perforation was reviewed. There were total of 15 patients with 8 (53.4%) males and 7 (46.6%) females. Out of these, 10 (66.6%) patients are mentally disabled. Majority of the patients (73%) were more than 50 years old. The visual acuity at presentation was poorer than 3/60 in 12 (80%) patients, out of which 10 (83%) patients are mentally disabled. There was a high proportion of perforation, 12 (80%) caused by infective keratitis which is also the main cause of perforation among disabled patients. Among the mentally disabled patients, 5 patients (50%) underwent evisceration, 4 patients (40%) underwent conjunctival flap and 1 patient (10%) was managed conservatively. Comparing with the patients without disability, 2 (40%) patients underwent tectonic keratoplasty, 2 (40%) patients underwent evisceration and 1 (20%) patient underwent conjunctival flap. People with disabilities experience worse health and poorer access to health care compared to people without disability. The presenting visual acuity in the disabled group is poorer. The main cause of corneal perforation among mentally disabled was infection and the options of treatments mainly were conjunctival flaps and evisceration.

Keywords: Corneal perforation, Mental disability, Tectonic keratoplasty, Conjunctival flap, Evisceration

INTRODUCTION

Diseases affecting the cornea are a major cause of blindness worldwide. According to the WHO global perspective, it ranks only second to cataract in its overall importance.[1] It has complex epidemiology stemming from a wide variety of infectious and inflammatory eye diseases. Ocular trauma and corneal ulceration are significant causes of corneal blindness that are often underreported but may be responsible for 1.5-2.0 million new cases of monocular blindness every year.[1]

Corneal ulceration in developing countries has only recently been recognized as a "silent epidemic".[1] Gonzales et al found that the annual incidence of corneal ulceration in South India was 10 times the incidence reported in developed country with disastrous outcome such as corneal perforation, endophthalmitis, or phthisis.[2]

Corneal perforation is an ocular emergency arising from traumatic and non-traumatic etiology. There are multiple primary disease leading to a non-traumatic perforation.[3] It can be grouped as infectious and non-infectious conditions such as ocular surface related and autoimmune.[4] Of this, demographic factor is quite often related to an infectious corneal perforation. Delay in starting definite treatment has been shown to be a risk factor for perforation in corneal ulcers,[5] with its outcome

very much affected by low socio-economic background of the patient.[4]

Mental disability (MD) or mental illness refers to a range of mental health conditions which affect thinking, mood or behaviour and it includes neurodevelopmental disorders, depressive disorders and others.[6]

There are about 1.15 billion people in the world having a disability and they can be considered as one of the vulnerable minority groups (World health organization, 2016). In Malaysia, 897,639 people suffer disability and they represent 3% of the country's population in 2015 (Department of social welfare). It has also been reported that over 20% of adults aged more than 60 suffer from mental and neurological disorder. Common mental disorders are dementia and depression affecting 5-7% of these adults.

This study was done to evaluate the causes and management of corneal perforation among mentally disabled patients in Melaka.

METHODOLOGY

This is a retrospective study of medical records of all patients who presented with corneal perforations to Malacca general hospital between January 1, 2019 and December 31, 2022. The study adhered to the tenets of the declaration of Helsinki. Corneal perforation was defined by a defect in the cornea and a positive Seidel's test. Data including age, sex, aetiology of perforation, associated ocular and systemic comorbidities and treatment option were collected and analysed. Data were presented as arithmetical mean standard deviation. Subjects were classified into mentally disabled and mentally abled. Demographic factors, ocular and systemic comorbidities, and outcomes were compared between groups by Fisher exact test. Statistical analysis was performed using IBM SPSS 23 Analysis System. A $p<0.05$ was considered significant.

OBSERVATIONS

There were 15 patients who were admitted during the period of 2019-2022. There were 8 (53%) males and 7 (47%) females. 10 out of these 15 patients were mentally disabled. In both the groups, majority of the patients, 6 (60%) in mentally disabled and 4 (40%) in mentally abled were more than 65 years old. 30% of the mentally disabled patients are nursing home residence, while 70% of them reside at home.

The visual acuity at presentation was <6/60 in both groups. The visual acuity was not recordable in 3 patients (30%) of the mentally disabled group due to cognitive impairment. 40% of the mentally disabled patients and mentally abled patients had no perception to the light (NPL).

Overall, the most common cause of corneal perforation was infection, which was 9 patients (90%) in the mentally disabled group and 3 patients (60%) in the mentally abled group. In the mentally disabled group, 4 patients (40%) had total, 4 patients (40%) had large and 2 patients (20%) had small size of perforation. Whereas for the mentally abled group, there was no total perforation reported, 2 patients (40%) had large perforation and 4 patients (60%) had a small perforation.

In the mentally disabled group, 5 patients (50%) had evisceration, 4 patients (40%) had conjunctival flap and 1 patient (10%) was managed conservatively. In the mentally abled group, 2 patients (40%) had penetrating keratoplasty, 2 patients (40%) had evisceration, 1 patient (20%) had conjunctival flap and no patients were treated conservatively.

Table 1: Comparison of demographics, clinical characteristics and treatment options of corneal perforation between mentally abled and mentally disabled patients.

Variables	Mentally disabled	Mentally abled	P value
Age (In years)			
>65	6 (60)	2 (40)	0.3
25-65	3 (30)	2 (40)	
<25	1 (10)	1 (20)	
Gender			
Male	6 (60)	2 (40)	0.6
Female	4 (40)	3 (60)	
Visual acuity at presentation			
Unable to assess	3 (30)	0	0.3
NPL	4 (40)	2 (40)	
>3/60	1 (10)	2 (40)	
3/60-6/60	2 (20)	1 (20)	
Causes of perforation			
Infectious	9 (90)	3 (60)	0.07
Non infectious	1 (10)	2 (40)	
Size of perforation			
Total	4 (40)	0 (0)	0.25
Large	4 (40)	2 (40)	
Small	2 (20)	3 (60)	
Treatment			
Penetrating keratoplasty	0 (0)	2 (40)	0.09
Evisceration	5 (50)	2 (40)	
Conjunctival flap	4 (40)	1 (20)	
Conservative	1 (10)	0 (0)	

DISCUSSION

Few studies have reported the outcome of the elderly with mental disabilities who presented with corneal perforation.

In our study, majority of people with who were elderly with mental disability presented with corneal perforation

secondary to infective keratitis. This corresponds with previous studies which showed elderly constitute a considerable proportion of patients with severe corneal ulcers.[7] As the proportion of elderly in the population is increasing, it is likely that in the near future even more elderly patients will present with severe infectious keratitis needing treatment.[7] Prior studies have found history of ocular disease and ocular surgery to be the leading risk factors of microbial keratitis in elderly. Similarly, systemic diseases such as diabetes and dementia have been associated with microbial keratitis in nursing home residents.[8] Only one patient in the mentally disable group presented as corneal perforation secondary to trauma, which has shown to be the leading cause in most of the other reported studies.

Four patients (40%) in the mentally disabled group presented with a total perforation, whereas none in the mentally abled group presented with a total perforation. A study by Henry et al reported that increased age is one of the main risk factors that leads to infectious keratitis related endophthalmitis and loss of eye worldwide.[9] Worsening of infectious keratitis and poor visual outcome is also commonly noted in patients with systemic conditions that decrease immune competence such as diabetes, HIV, or chemotherapy or their ability to seek medical care such as dementia.

Main treatment option for the patients with mental disability was evisceration and conjunctival flap. Penetrating keratoplasty (PK) is infrequently performed for the mentally disabled due to the high risk of serious post-operative complications, in particular wound rupture and severe inflammation of the graft. Patient's tendency for eye rubbing and possibly self-inflicted injury also hinders the graft survival.[10] Graft rejection may result from self-traumatisation and non-compliance with the post-operative regime. In a study reported by Garcia et al, PK is a safe procedure in mild and moderately mentally retarded patients without compulsive ocular patterns. Providing medical education to caregivers is essential for the correct management of these patients.[10]

CONCLUSION

The relationship between disability, health, and healthcare access is complex. It is shown that due to the inaccessible environments, people with disabilities are believed to experience poorer access to health services. It is also shown this group of people require greater specialist care and rehabilitation, yet they also experience greater barrier to access it leading to suboptimal treatments. Our study shows the visual acuity at presentation was poor and the options of treatments mainly were conjunctival flaps and evisceration. As a preventive measure, the urgency to develop interventions to improve access to primary healthcare and adequate education on eye care is essential to optimise the healthcare needs of people with disabilities.

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