

Evaluation of Anxiety and Depression and its Associated Factors using HADS Questionnaire in NasoLacrimal Duct Obstruction Patients

by

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DISCLAIMER

I hereby certify that the work in this is my own except for the quotations and summaries which have been acknowledged.

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ABSTRACT

Introduction:

Nasolacrimal duct obstruction (NLDO) also known as dacryostenosis, is an anatomic obstruction that may occur along the lacrimal drainage pathway and may be congenital or acquired. Acquired NLDO may be primary acquired NLDO (PANLDO) or secondary acquired NLDO with the primary appearing as the most common type. Most NLDO patients

complain of occasional conjunctival hyperemia and epiphora. Psychological sequelae of NLDO is often not addressed by the treating physician. Thus, identification of such sequelae may be helpful to these patients and brings attention to the need of referral to the appropriate channels for further evaluation.

Objective:

The aim of our study was to evaluate the levels of anxiety and depression in NLDO patients and to determine the potential predictors associated with it.

Methods:

A cross-sectional study was conducted between March 2021 and March 2022 involving NLDO patients attending eye clinics in Hospital Universiti Sains Malaysia. Patients were given the validated Hospital Anxiety and Depression Scale (HADS) and an evaluation of Munk score. After completion, the questionnaires were calculated and scored, and statistical analysis was done using Statistical Package for the Social Science (SPSS Inc. Version 26).

Results:

A total of 109 patients diagnosed with NLDO participated in this study. The demographic and clinical variables assessed were age, gender, race, marital status, highest education, duration of NLDO in years and severity of epiphora.

The mean HADS-Depression score was 4.61 (SD 3.4) with a range of scores from (0 to 12). There were 25.7% (n=28) of the total number of patients had depression. Seventy-four and three tenths percent of the patients had normal depression scores, while 22.0% and 3.7% of the participants had mild and moderate depression respectively. The mean HADS-Anxiety score was 5.98 (SD 4.34) with a range of scores from (0-14). A total of 35.8% (n=39) of patients had anxiety. Sixty-four and two tenths percent of the patients are normal, while

19.3% and 16.5% of the patients had mild anxiety and moderate levels of anxiety respectively. A score of more than 8 represents mild depression or anxiety. There were significant associations between age, NLDO duration, epiphora and dabbing with depression levels based on the multiple linear regression ($p < 0.05$ for all variables tested). Similarly, there were significant associations between epiphora and dabbing 2-4/day and 5-10/day with increased anxiety levels among the patients where $p < 0.05$ for the variables. In addition, depression scores decreased by 0.048 with age among the patients. Similarly, NLDO duration of 1-5 years and >5 years have 4.054 and 4.683 chances of having depression when compared to single patients respectively. For anxiety, for patients with NLDO duration of > 5 years have 2.642 chance of experiencing the condition that those with the duration of < 5 years.

Conclusion:

This study showed a low prevalence of depression and anxiety among NLDO patients. Younger age group, NLDO duration and epiphora requiring dabbing were associated with depression among the patients; Whereas NLDO duration and epiphora requiring dabbing were associated with increased level of anxiety.

CHAPTER 1

INTRODUCTION

1.1 NASOLACRIMAL DUCT OBSTRUCTION

Nasolacrimal duct obstruction (NLDO), also called dacryostenosis, is an anatomic obstruction that may occur along the lacrimal drainage pathway and may be congenital or acquired (Kamal, S. & Ali M.J., 2018). There are two types of acquired NLDO, primary and secondary. Primary acquired nasolacrimal duct obstruction (PANLDO) is the most common clinical syndrome of acquired NLDO in adults. Linberg and McCormick coined the term to describe NLDO caused by inflammation or fibrosis without any precipitating cause (Linberg and McCormick, 1986). Secondary acquired NLDO is caused by many precipitating factors including infection, inflammation, neoplasm and trauma. Abnormal duct patency and the resultant disruption of normal drainage may lead to dacryocystitis, an inflammation of the lacrimal sac.

Adults often present with chronic tearing and eyelash crusting but adults may also present with painful swelling below the medial canthus and mucopurulent discharge regurgitation from the punctum. The clinical history of the patients is used to differentiate excess tear production from an excess accumulation of tears due to drainage obstruction (Mills *et al.*, 2006). Knowledge of the level of obstruction, the shape and the size of the lacrimal sac and presence of any associated fistulae and diverticula will be important in helping appropriate management of a patient with epiphora, in order to lower the risk of failure post surgical intervention.

1.1.1 ANATOMY OF NASOLACRIMAL DUCT

The nasolacrimal duct, measuring approximately 12– 18 mm in length, is part of the lacrimal drainage system. It is the continuation of the lacrimal sac inferiorly. It runs downwards with slight lateral and posterior angulation and then opens into the inferior nasal meatus, which is situated just below and lateral to the inferior turbinate. A fold of mucosa called the valve of

Hasner covers the duct's opening. Secondary distension of the lacrimal sac may develop in NLDO (Figure 1).

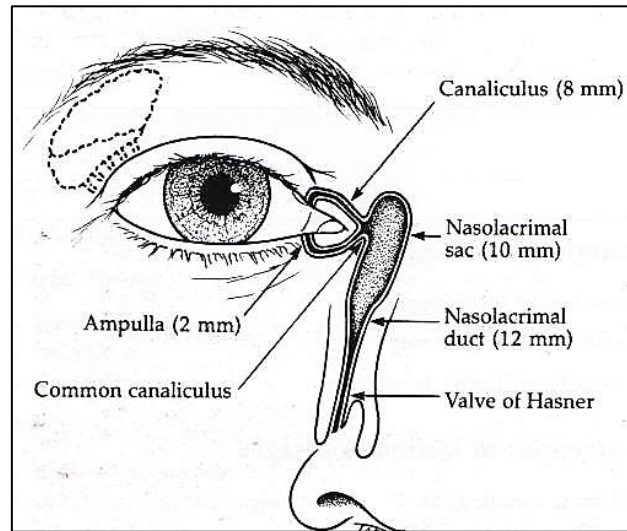


Figure 1. Anatomy of lacrimal drainage system

1.1.2 PHYSIOLOGY OF LACRIMAL DRAINAGE

Secretion of tears by the main and accessory lacrimal glands pass across the ocular surface. Some amount of aqueous part of the tear film is lost by evaporation which is related to blink rate, palpebral aperture size, humidity and ambient temperature. The remaining tear fluid drains by the following means: (Ayub M. *et al.*, 2003)

- a) Tears flow along the lower and upper marginal strips to enter into the lower and upper canaliculi by capillary suction.
- b) With each blink, the pretarsal part of orbicularis oculi will compress ampullae, which will shorten and compress the horizontal canaliculus leading to medial movement of the puncta. Simultaneously, the lacrimal part of orbicularis oculi, which is attached with the fascia of the lacrimal sac, will contract and then compresses the lacrimal sac, which thereby creates a positive pressure leading to flow of tears down through the nasolacrimal duct and then into the nasal cavity.

c) When the eyes open, the pretarsal part of orbicularis oculi will relax and the canaliculi and the lacrimal sac will expand by which creating negative pressure assisted by suction and capillarity, will eventually draws the tears into the empty lacrimal sac from eye.

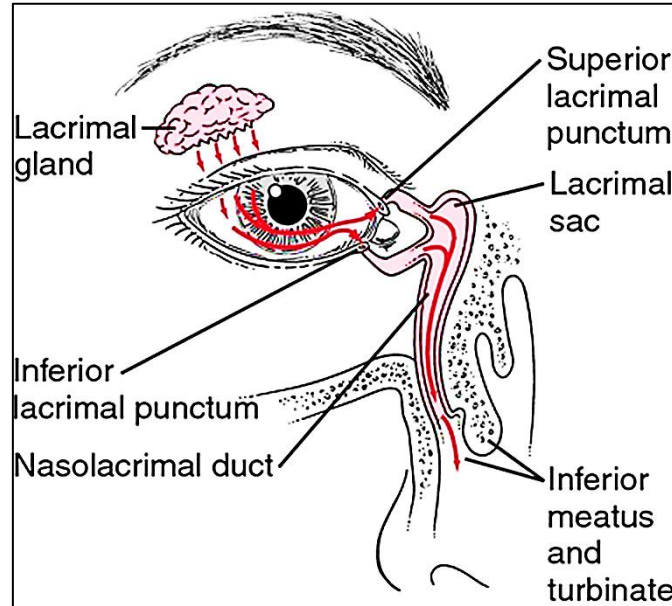


Figure 2. Physiology of lacrimal drainage

1.1.3 ETIOLOGIES OF NASOLACRIMAL DUCT OBSTRUCTION

There are several known etiologies of NLDO, often referred to as secondary acquired lacrimal drainage obstructions (SALDO), as opposed to primary or idiopathic obstructions, primary canalicular stenosis is quite rare and in many cases a secondary cause can be found. In contrast to acquired NLDO, the majority of cases are idiopathic. This is also named primary acquired nasolacrimal duct obstruction (PANLDO) (Das AV *et al.*, 2018).

PANLDO results from inflammation of unknown causes will eventually lead to occlusive fibrosis. Secondary acquired NLDO may result from a wide variety of inflammatory, infectious, neoplastic, traumatic or mechanical causes (G B Bartley, 1992).

Epiphora, a prevalent condition that rarely getting attention. Epiphora results from the accumulation of tears in the palpebral fissure with eventful overflow down the cheeks, denotes evidence of excess tearing due to lacrimal outflow deficiency. Hyperlacrimation denotes an excess production of tears. In NLDO, epiphora occurs due to deficiency of lacrimal outflow. Epiphora can affect variable aspects of daily activities and it has an impact on vision-related quality of life (Shin J *et al.*, 2015). A history of chronic allergies, sinusitis, nasal surgery, sinus surgery, prior midfacial fractures or radiation therapy may indicate NLDO. Systemic inflammatory diseases such as Wegener's granulomatosis, sarcoidosis, Crohn's disease, and ulcerative colitis have also been associated with an increased risk of NLDO (Mauriello *et al.*, 1994), (Satchi K. *et al.*, 2009). However, in a standard test situation the visual acuity is seldom affected, leading to the misinterpretation that epiphora is a minor problem. Patients report social discomfort as a result of red eyes and constant eye wiping, and the misperception that they are sad or crying (Bohman E., 2021).

In a retrospective, population-based study by John J. Woog *et al.* (2007) focusing on the incidence as well as localization of symptomatic acquired lacrimal outflow obstruction in an American population in the period 1976-2000, five hundred and eighty-seven patients were involved. It was concluded that the incidence increased in the period of the study and the majority of patients were diagnosed with NLDO with a suggestion that such increase may continue in the future.

In a retrospective study focusing on the aetiologies and diagnosis of excessive tearing by analysing the referrals to oculoplastic clinics, it was found that the most common cause among this study sample was nasolacrimal duct obstruction (Norman Mainville *et al.*, 2011).

1.1.4 DIAGNOSIS OF NASOLACRIMAL DUCT OBSTRUCTION

Diagnosis and evaluation of NLDO are made by history taking and a thorough eye examination with investigations to confirm the diagnosis of NLDO. The history should note any sinus problems, trauma or granulomatous disease, as well as the timing and onset of symptoms. The eye exam concentrates on the lids (lid position, lid margins, lid lashes, and puncti), conjunctiva, and cornea. Digital pressure over the lacrimal sac producing mucoid reflux from the punctum indicates an obstruction. The dye disappearance test with fluorescein is helpful. A drop of fluorescein dye is instilled in each eye and the time for the vanish is monitored. Prolonged or asymmetric dye clearance is found in NLDO. Jones I test is the installation of fluorescein in the conjunctival sac, and a cotton-tipped applicator is used to attempt fluorescein retrieval via the external naris. A positive test indicates a functional blockage. Jones II test by nasolacrimal irrigation with saline following positive Jones I test, and fluorescein retrieval is attempted once again. A positive test indicates an anatomic blockage. Nasolacrimal irrigation using a 23-gauge cannula mounted on a 3-5 cc syringe is inserted into the canaliculus, and irrigation is attempted. Retrograde flow through the opposite canaliculus and punctum indicates nasolacrimal blockage (Guzak *et al.*, 1997).

1.1.5 MANAGEMENT OF NASOLACRIMAL DUCT OBSTRUCTION

The management of NLDO differs upon the advance of the condition. There is increased risk of dacryocystitis in NLDO. Acquired NLDO may progress to secondary infection, dacryocystitis, mucocele, pyocele, chronic conjunctivitis, and abscess formation (Nemet AY *et al.*, 2014). The use of systemic antibiotics is necessary in ineffective topical antibiotic therapy, abscess formation, recurrent dacryocystitis or orbital cellulitis. Treatment of partial NLDO by topical antibiotic and steroid combination is considered. Silicone intubation or

dacryoplasty is of consideration for persistent partial NLDO. Complete NLDO with patent canaliculi and functional lacrimal pump requires dacryocystorhinostomy (DCR) by an oculoplastic surgeon. The definitive treatment of NLDO with a success rate of more than 90% is by lacrimal bypass surgery with DCR (Y M Delaney *et al.*, 2002).

1.2 ANXIETY AND DEPRESSION

Anxiety is a general term for several disorders that cause worrying, nervousness, fear, and apprehension. The spectrum of anxiety can range from mild to severe and may eventually manifest as physical symptoms. This can severely debilitate a person and can affect daily activities and behaviour.

Anxiety disorders can further be classified according into more specific types using the DSM-5, the new edition of the Diagnostic and Statistical Manual of Mental Disorders. These include common disorders such as General Anxiety Disorder, Panic Attacks and Panic Disorder.

Anxiety can be considered as a normal response to confronting a stressful situation. Anxiety could influence how people react to different situations (Lazarus and Folkman, 1984). However, it may be distressful if it begins to interfere with the individual's ability to function or to sleep.

Depression is one of the most common mental disorders (Murray and Lopez, 1997). It may lead to deterioration from a previous function in the presence of psychological complaints such as loss of interest or pleasure, depressed mood, feelings of guilt or worthlessness and recurrent thoughts of suicide. Depression may also lead to somatic symptoms including significant weight change, physical agitation, sleep disturbance, fatigue and inability to

concentrate (American Psychiatry Association, 2013). Prevalence of depression in Malaysia varied from 3.9 to 46% (Mukhtar and P. S. Oei, 2011).

In NLDO patients, epiphora results from the accumulation of tears in the palpebral fissure with eventful overflow down the cheeks with evidence of excess tearing due to lacrimal outflow deficiency. Patients report social discomfort as a result of red eyes and constant eye wiping, and the misperception that they are sad or crying. The affected individuals may anticipate negative reactions from others and may become shy and defensive thus leading to social anxiety, lowered self esteem and social avoidance (Shin J *et al.*, 2015).

1.3 HADS

Hospital Anxiety and Depression Scale (HADS) is a simple but useful screening tool to detect various states of anxiety and depression in outpatients visiting clinics. It is also validated and used for medical and psychiatric patient populations, as well as non-medical populations. The HADS consists of 14 sections composing two subscales: Anxiety (HADS-A) with 7 sections and Depression (HADS-D) with 7 sections. The score of each subscale may range from 0 to 21 with consideration of the higher scores having the greater levels of anxiety or depression. Scores of 0 to 7 are considered normal, 8 to 10 is moderate and more than 10 indicates a high possibility of clinical anxiety and depression (McBain *et al.*, 2014). HADS showed a good sensitivity and specificity and therefore it is considered as a valid instrument for such purposes (Ingvar Bjelland *et al.*, 2002).

1.4 QUALITY OF LIFE

The World Health Organization (WHO) defined the term “Quality of Life” (QoL) as the subjective perception of well-being and wholeness. This broad concept can be affected in a complex way by the individual’s physical health, level of independence, social relationships,

psychological state and the silent features of their environment (World Health Organization, 1947).

The assessment of health-related quality of life can provide a more holistic assessment of the impact of disease and its treatment including dimensions of patient's physical, social and emotional well-being. It can be considered as an important expansion of the disease assessment beyond the traditional areas of morbidity, mortality, symptoms and signs.

Quality of life also health economic implications, as of more precise knowledge of the impact on quality of life can determine the level of disease at which benefits of screening outweighs the cost. Vision-related quality of life (VRQOL) is related to visual function yet it is not identical to it. VRQOL illustrated the extent to which vision impacts a person's ability to accomplish activities of daily living that rely on sight (Angeles-Han *et al.*, 2011)

1.5 STUDY RATIONALE

The rationale of this study animate the aim to provide better care and management of NLDO patients by understanding their quality of life and the focus of this study is to investigate if there is anxiety or depression in patients with NLDO using the HADS scale. This could be the first assessment of psychological effect of NLDO in the affected patients.

Previous studies reported that the quality of life in NLDO patients is deteriorated due to epiphora and other symptoms, and assessed the NLDO symptom scores after surgical intervention (Grigori Smirnov *et al.*, 2010).

Other studies assessed children with NLDO and thier parents focusing on the quality of life. Such patients tended to have more embarresment and discomfort in their daily activities (Holmes JM *et al.*, 2006). Other studies reported a positive change in the quality of life of

nasolacrimal duct stenosis patients with dry eyes after surgical interventions (Jong Rok Oh *et al.*, 2015).

Yet, the levels of anxiety and depression among patients with NLDO were not explored in previous studies. There are no available statistical data for NLDO in Malaysia or South-East Asia. Therefore, the aim of this study is to determine if there is indeed levels of anxiety, depression and impact on the quality of life in patients with NLDO in a Malaysian population.

The psychological and emotional aspects concerned with NLDO patients are often overlooked and not addressed by eye care providers. This study aims to evaluate the psychological effect and the levels of anxiety and depression in NLDO patients to signify the amplitude of problem and to provide a better care.

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CHAPTER 2

OBJECTIVES OF THE STUDY

2.0 STUDY OBJECTIVES

2.1 GENERAL OBJECTIVES

To evaluate the anxiety and depression and its associated factors using HADS questionnaire in NLDO patients.

2.2 SPECIFIC OBJECTIVES

2.2.1

To determine the mean of anxiety and depression scores using HADS questionnaire in NLDO patients in Hospital Universiti Sains Malaysia.

2.2.2

To determine the prevalence of anxiety and depression using HADS questionnaire in NLDO patients in Hospital Universiti Sains Malaysia.

2.2.3

To determine the associated factors of the anxiety and depression scores using HADS Questionnaire in NLDO patients in Hospital Universiti Sains Malaysia.

CHAPTER 3

MANUSCRIPT

EVALUATION OF ANXIETY AND DEPRESSION AND ITS ASSOCIATED FACTORS USING HADS QUESTIONNAIRE IN NASOLACRIMAL DUCT OBSTRUCTION PATIENTS

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3.1 ABSTRACT

Background:

Patients with nasolacrimal duct obstruction (NLDO) often report complain of epiphora and conjunctival hyperemia. Previous studies have addressed that NLDO patients quality of life is affected and that patients with epiphora have a significant impact on their quality of life and causing embarresment and discomfort in their daily activities. Yet, the levels of anxiety and depression among NLDO patients were not explored in previous studies. The aim of our study is to evaluate the level of anxiety and depression in patients with NLDO and to determine the potential predictors associated with it.

Methods:

A cross-sectional study was conducted between March 2021 and March 2022 involving NLDO patients attending eye clinics in Hospital Universiti Sains Malaysia. Patients were given the validated Hospital Anxiety and Depression Scale (HADS) questionnaire and demographic information were also collected. After completion, the questionnaires were calculated and scored. A score more than 8 represents a mild anxiety or depression and the higher the score, the higher the level. Descriptive analysis and Linear regression analysis were done using Statistical Package for the Social Science (SPSS Inc. Version 26).

Results:

A total of 109 patients diagnosed with NLDO participated in this study. The demographic and clinical variables assessed were age, gender, race, marital status, highest education, duration of NLDO in years and severity of epiphora.

The mean HADS-Depression score was 4.61 (SD 3.4) with a range of scores 0-12. Seventy-four and three tenths percent of the patients had normal depression scores, while 22.0% and 3.7% of the participants had mild and moderate depression respectively. The mean HADS-