Quality of Life of Patients with Meniere's Disease in Alexandria - Egypt

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Abstract:

Background: Meniere's disease is a rare disorder of the inner ear that causes dizziness, vertigo and balance problems. Some people have several attacks of Meniere's disease in a short period of time, while other people only have an attack every few months or years. **The aim of this study** was to assess the quality of life of patients with Meniere's disease. **Subjects and Method: Setting:** The study was carried out in ear, nose, and throat (ENT) department at Alexandria Main University Hospital, Egypt. **Subjects**: The study subjects comprised a convenience sample of 100 adults of Meniere's disease' patients. **Tools:** Two tools were used: Tool I: Socio-demographic and Clinical Data Structured Interview Schedule, and Tool II: Health-Related Quality of Life (HRQOL) of Meniere's disease. Results: The mean age of the studied patient was 43.38±7.45 years. The majority of them were unemployed, coming from rural area and more than half of them had sufficient monthly income (65, 65 & 54%) respectively. Additionally, half of the studied patients (50%) had severe degree of Meniere's disease and the majority of them had overall poor quality of life. Highly statistically significant relations between patient's physical, psychological as well as environmental domains and the severity of disease was detected. Furthermore, there was a statistically significant relation between quality of life domains of the studied patients and all of their socio-demographic characteristics. Conclusion: Meniere's disease had a significant negative impact on the majority of patients 'quality of life. Accordingly, conducting a comprehensive assessment of patients' quality of life among patients with MD is necessary to determine the degree of suffering; this will help the nurses to predict their functional status and the effect of MD on their quality of life.

Keywords: Meniere's disease, Patient's Quality of Life

Introduction

Meniere's disease is a chronic, incurable vestibular (inner ear) disorder defined in 2091 by the **Committee on Hearing and Equilibrium of the American Academy of Otolaryngology- Head and Neck Surgery** [1] as "the idiopathic syndrome of endolymphatic hydrops. Meniere's disease has been reported as having a significant negative impact on emotional and psychological well-being and quality of life and they can severely disrupt activities of daily living [2]. Canadian Hearing Society (2017) [3] reported that hearing loss is one of the leading causes of disability in Canada and worldwide, with more than one million Canadians enduring a hearing-related disability. Despite the availability of various interventions, Canadians with hearing loss may endure a diminished quality of life. Meniere's disease (MD) is a condition that is thought to arise from abnormal fluid and ion homeostasis in the inner ear [4].

The disease is named for Prospere Meniere, a French physician who was first known victim of this disease. MD is a chronic, intermittent, and rare disorder affecting the inner ear characterized by fluctuating sensorineural hearing loss (SNHL), episodes of vertigo lasting from 20 minutes to hours, tinnitus, aural fullness and disequilibrium [5-8].

Moreover, early in MD, Sensorineural Hearing Loss (SNHL) starts unilateral and fluctuates, primarily affecting low frequencies then high ones. With disease progression, hearing loss starts to stabilize with moderate to severe sensorineural up to profound in advanced cases [9]. Development of the later secondary to bilateral MD is relatively rare but should occur. It was estimated that about 1-6% of patients develop severe to profound bilateral SNHL because of the natural progressive course of MD [10]. These symptoms may lead not only to physical consequences, including imbalance and hearing loss, but also mental and psychological problems, such as depression, anxiety, panic, and cognitive defects, especially in the elderly If left untreated[8].

The prevalence of Meniere's disease (MD) in the United States is estimated to be 190 per 100000. It is more likely to occur in women, and the prevalence increases significantly with aging [11]. Meniere's disease (MD) is a condition that frequently causes hearing loss and may have a large emotional and

financial toll on patients, their families, and society that is often under estimated [5].

Impacts of MD on patients' quality of life can be severe, particularly with respect to restrictions in social participation and physical activity, fatigue, and reduced capacity to work [12]. Anxiety and other psychological disorders may result from these restrictions on life, the constant uncertainty of vertigo attacks, and fluctuating SNHL with neuroses and depression affecting 40 to 60% of sufferers of intractable MD [13]. Patients with Meniere disease report significantly impaired quality of life compared to healthy individuals [14].

In the light of this, the health-related quality of life (HRQOL) is a multidimensional concept, which reflects core components of functioning (e.g. physical, psychological/emotional and social functioning) in the context of medical conditions. HRQOL measurements evaluate the impact of MD on subjective well-being[15,16].

Aim of the study

This study aims to assess quality of life of patients with Meniere's disease

Research question:

What is the impact of Meniere's disease on patient's quality of life?

Subjects and Method

Research design:

A descriptive research design was utilized to meet the aim of the present study.

Setting:

This study was conducted at ear, nose, and throat (ENT) department of Alexandria Main University Hospital. The hospital is affiliated to Alexandria University, Egypt.

Subjects:

A convenience sample of 100 adults of Meniere's disease' patients were included in the study.

The Epi info 7 program was used to estimate sample size according to the following parameters:

- Population size= 220 patients in2018-2019
- Expected frequency=50%.
- Maximum margin of error=10%.
- Confidence coefficient=95%.
- Estimated sample size = 100patients.

Inclusion criteria: Participants were included if they met the following inclusion criteria:

- Age: 20- 60 years old.
- Clinical diagnosis of Meniere'sdisease.

Exclusion criteria: Participants were excluded if they had any of the following:

- Uncontrolled hypertension, Diabetes Mellitus, or heart disease.
- Patient who had any other disorders that affect patient balance and equilibrium as other neurological illness as brain tumor etc…..
- Patient who had any other medical conditions can result in hearing loss as: acoustic neuroma, eardrum rupture, labyrinthitis, neurofibromatosis type 2, otitis externa, otitis media with effusion, shingles ,temporal arteritis, or vertebrobasilar insufficiency.

Tools: Two tools were used to collect the necessary data in the current study:

Tool I: Socio-demographic and clinical data structured interview schedule: It will be developed by the researchers to collect baseline data. It consisted of two parts as follows:

Part I: Patient's Socio-demographic Characteristics: as age, gender, educational level, occupation, marital status, residence area and income.

Part II: Patient's Clinical Data: as family history, duration of disease, and severity of the disease. Severity of the disease was determined by using Meniere's disease Patient-Oriented Symptom Index (MD POSI). This index was developed by Gates (2012)[6] to provide an instrument that would measure the impact of inner ear problem on patients' health and well-being. It includes 20 items signs/symptom scale concerning the patient's health status during the preceding three months.

The items asked about the effect of Meniere's Disease's attacks on hearing, balance, ears, and performing daily activities (4 items), in-between attacks on hearing, balance, mental concentration, performing daily activities, fear of travel, and memory loss (6 items), degree of MD impact on social life, being close to others, general mood, and outlook for the future (4 items), as well as the degree of it affection on employment (6 items). Each item had five response options. The total score was ranged from 20 to 100; the mean percentage of the total score was classified as showed at table (1).

Table (1): Total score and percentage of Meniere's disease severity

Score	Percentage	Items
0 <30	0 <30%	Mild
30 <60	30 <60%	Moderate
60-100	60-100%	Severe

The scale has been tested for internal consistency and reliability by the original authors. Cronbach‟s alpha for the entire instrument was 0.87, and it has a coefficient correlation of 0.85.

Tool II: Health-Related Quality of Life (HRQoL) of Meniere's Disease

It was adopted from Kato et al. (2015)[17]. It is a self-report questionnaire used to assess the effect of Meniere's disease on the patient's quality of life, functioning, and overall well-being. It consisted of a 26- items instrument which included four domains: physical (8 items), psychological (6 items), social (5 items) and environmental health domain (7 items). Each item was rated on a five-point Likert Scale and scored from one to five on a response scale. Total score is ranged from 26 to 130. Answers of the studied patients were recorded, scored, and then summed together. The total score was converted into percent score as illustrated in table (2):

Table (2): Total score and percentage of patient's quality of life

Score	Percentage	Items
0 < 78	0 < 60%	Poor quality of life
78-130	≥ 60%	Good quality of life

Method

1- An approval from the Ethical Research Committee of the Faculty of Nursing, Alexandria University was obtained.

2- An official letter was issued from the Faculty of Nursing, Alexandria University to the study setting to obtain their permission to collect necessary data.

3- An official permission was obtained from the directors and head of the department of the selected hospital setting after explanation the aim of the study.

4- A socio-demographic structured interview schedule (tool I part I) was developed by the researchers.

5- Tools I part II and tool II will be translated into Arabic language. All tools were submitted to a jury composed of seven experts in the field of ENT and Medical-Surgical Nursing to test content validity of the scales.

6- A pilot study was initially carried out prior to the actual data collection phase on six patients to check clarity, feasibility and applicability of tools and determine obstacles that may be encountered during period of data collection, accordingly, needed modifications were done.

7- The reliability of the study tools will be ascertained by measuring the internal consistency of their items using the Cronbach alpha coefficient test.

8- Every patient was interviewed individually once for 30-45 minutes, using the two tools to collect data related to quality of life of patients with Meniere's disease.

9- Data collection started at the beginning of August 2018 and ended of March2019.

Ethical considerations:

For each recruited subject, the following issues were considered:

- Written permissions from head of department.

- Securing the subject's written informed consent after explanation of research purpose.

- Assuring confidentiality of the subject's data.

- Anonymity of the study participants was assured.

- Right to voluntary participation of the study subjects

- Right to withdraw at anytime.

Statistical analysis of the data:

- After data were collected, they

were coded and transferred into specially designed formats, so be suitable for computer feeding. Verification processes were carried out to avoid any errors during data entry.

- The suitable statistical program was utilized (IBM SPSS software package version23.0)

- (Armonk, NY: IBM Corp) for both data presentation and statistical analysis of results.

- Qualitative data were described using number and percent and Quantitative data were described using range (minimum and maximum), mean and standard deviation.

- Significance of the obtained results was judged at the 5%level.

- Cronbach's alpha reliability test was used to measure the reliability of all tools. Its maximum value is (α=1.0) and the minimum accepted value is (α= 0.7); below this level the tool would beunreliable.

- Comparisons between different groups regarding categorical variables were tested using the Chi - square test. When more than 20% of the cells had an expected count less than 5, corrections for chi-square were conducted using

Monte Carlocorrection.

Results

Table (3) showed frequency and percentage distribution of the studied patients according to their socio-demographic characteristics. It was found that about more than half of the sample (60%) were among the age group of (40 - 50 years). More than two thirds of studied patients were females, married and had low educational level (70%, 65% and 65%) respectively. Additionally, about two thirds of the studied patients were unemployed, coming from rural area and more than half of them had insufficient monthly income (65, 65 and 54%) respectively.

Table (4) depicted frequency and percentage distribution of patients with Meniere's disease according to their clinical data. The highest percent of patients (80%) had positive family history of Meniere's disease, in addition the majority of them (90%)diagnosed as MD since more than one year. As regards the severity of the disease, one third of sample (35%) had moderate degree of disease severity, whereas half of the studied patients (50%) had severe degree.

Table: (5) denoted relation and correlation between studied patients'

quality of life domains and their severity of Meniere's disease. It was evident that, the majority of the studied patients had overall poor quality of life related to physical, psychological, social, environmental domains (81, 68, 68 and 64 %) respectively. Additionally, there were highly statistically significant relations between patient's physical, psychological as well as environmental domains and the severity of disease were all$p < 0.001$.

Table (6): portrayed relation and correlation between studied patients' overall quality of life and their socio-demographic characteristics. This table revealed that, the studied patient who had poor quality of life were females, had low educational level, were unemployed, married, rural residents and had insufficient income (representing 34, 44, 29, 64, 60, and 45%) respectively. Furthermore, there was a statistically significant relation between quality of life scores of the studied patients and all of their socio-demographic characteristics except the marital status. (P =0.00).

Table (3): Frequency and percentage distribution of the studied patients according to their socio-demographic characteristics

Socio-demographic characteristics	No	%
Age:		
20-	6	6.0
30-	14	14.0
40-	**60**	**60.0**
50- 60	20	20.0
X ± SD	**43.38±7.45 years**	
Gender:		
Male	30	30.0
Female	**70**	**70.0**
Level of education:		
Illiterate	20	20.0
Low education	**65**	**65.0**
High education	15	15.0
Occupation:		
Administrative work	10	10.0
Manual work	25	25.0
Unemployed	**65**	**65.0**
Marital status:		
Married	**65**	**65.0**
Divorced	5	5.0
Widow	15	15.0
Single	15	15.0
Residence area:		
Rural	**60**	**60.0**
Urban	40	40.0
Income:		
(From patient's point of view)		
Sufficient	46	46.0
Insufficient	**54**	**54.0**

X ± SD = Mean and standard deviation

Table (4): Frequency and percentage distribution of patients with Meniere's disease according to their clinical data

Clinical data	No	%
Family history:		
No	20	20.0
Yes	**80**	**80.0**
Diagnosed as MD since(years):		
≤ one year	10	10.0
> one year	**90**	**90.0**
Severity of the disease:		
Mild	15	15.0
Moderate	35	35.0
Sever	**50**	**50.0**

Table (5): Relation and correlation between studied patients' quality of life domains and their severity of Meniere's disease

Quality of life domains	Severity of Meniere's disease						X2	P
	Mild (n=15)		Moderate (n=35)		Severe (n=50)			
	No.	%	No.	%	No.	%		
Physical domain:								
• Poor quality	11	11.0	30	30.0	40	40.0	8.518	<0.001*
• Good quality	4	4.0	5	5.0	10	10.0		
Psychological domain:								
• Poorquality	15	15.0	18	18.0	35	35.0	7.681	<0.001*
• Good quality	0	0.0	17	17.0	15	15.0		
Social domain:								
• Poorquality	10	10.0	20	20.0	38	38.0	0.0555	0.960
• Good quality	5	5.0	15	15.0	12	12.0		
Environmental domain:								
• Poorquality	14	14.0	22	22.0	28	28.0		
• Good quality	1	1.0	13	13.0	22	22.0	3.681	<0.001*
Overall quality of life:								
• Poorquality	15	15.0	30	30.0	45	45.0		
• Good quality	0	0.0	5	5.0	5	5.5	12.019	<0.001*

χ^2: Chisquaretest   *: Statistically significant at p ≤0.05

Table (6): Relation and correlation between studied patients' overall quality of life and their socio-demographic characteristics

Socio-demographic characteristics		Overall Quality of Life				Test of sig.
		Poor Quality		Good Quality		
		No	%	No	%	
Sex:	Male	30	30.0	0	0.0	χ^2 = 24.107
	Female	34	34.0	36	36.0	P =0.00*
Level of education:	Illiterate	20	20.0	0	0.0	χ^2 = 38.301
	Low education	44	44.0	21	21.0	P =0.00*
	High education	0	0.0	15	15.0	
Occupation:	Administrative work	10	10.0	0	0.0	χ^2 = 30.288
	Manual work	25	25.0	0	0.0	P =0.00*
	Unemployed	29	29.0	36	36.0	
Marital status:	Married	64	64.0	1	1.0	Mc= 0.046
	Divorced	0	0.0	5	5.0	P=0.070
	Widow	0	0.0	15	15.0	
	Single	0	0.0	15	15.0	
Residence area:	Rural	60	60.0	0	0.0	χ^2 = 84.375
	Urban	4	4.0	36	36.0	P =0.00*
Income	Sufficient	10	10.0	36	36.0	χ^2 = 66.033
	Insufficient	54	54.0	0	0.0	P =0.00*

χ^2: Chisquaretest   Mc=Montecarlotest   *: Statistically significant at p ≤0.05

Discussion

Meniere's disease (MD), a condition that causes hearing loss, has a variable clinical course and often an underestimated emotional and financial toll on patients, their families and society. MD consists of a triad of symptoms, including fluctuating sensorineural hearing loss (SNHL), vertigo attacks, and tinnitus. Quality of life can be dramatically impacted due to reduction in social participation, physical activity, increased fatigue, and diminished work capacity [4].

Aging is a significant factor influencing the course of MD; the present study demonstrated that more than half of the sample were among the age group of (40 - < 50 years). This finding was consistent with **Joy (2020)** [18] who reported that it is most likely to occur in people in their 40s and 50s. Additionally, **National Institute on Deafness and Other Communication Disorders (NIDCD) (2013)** [19] who stated that MD can develop at any age, but it is more likely to happen to adults between 40 and 60 years of age.

In relation to gender, in the current studied patients, the highest percent of them were females; this may be explained by many hormonal effects occur during the premenstrual period

and compartmental fluid redistribution within the body may be the most pertinent. Endolymphatic hydrops represents a fluid imbalance within the inner ear and, when combined with an additional fluid shift, may produce symptomatic dysfunction. Case histories demonstrating the correlation of the symptoms of Meniere's disease, and the premenstrual period will be presented along with theoretical mechanisms of pathophysiology [20]. This result was congruent with the results of **Teixeira and Cavalcante (2017)** [21] who concluded that, females are expected to be diagnosed with MD three times more often thanmales.

The main findings of the current study revealed that, the majority of the studied patients were low educational level, married, unemployed, had rural residence and had insufficient monthly income. These findings were supported by **Lopez-Escamez et al., (2015)**[7] who mentioned that The cause of Meniere's disease is unclear but likely involves both genetic and environmental factors. Moreover, these findings were matched with **Haybach et al., (2013)** [22] who reported that some people with Meniere's disease find that certain events and situations,

sometimes called triggers, can set off attacks. These triggers include stress, overwork, fatigue and emotional distress.

As regards family history, the findings of the present study revealed that the majority of the studied patients were had no family history of Meniere's disease. This finding was congruent with **NIDCD (2013)** [19] who stated that Meniere's disease appears to run in families, and it could also be the result of genetic variations that cause abnormalities in the volume or regulation of endolymph fluid. Furthermore, this result was in the same line with **Martinez et al., (2020)** [23] who studied the genetics of MD and reported that MD is a complex set of rare disorders with a strong genetic contribution.

According to the clinical data of the studied MD patients, the results of current study revealed that, the majority of patients diagnosed as MD since more than one year and half of them had severe degree of disease. These findings were matched with **NIDCD (2013)** [19] who illustrated that, MD is a disorder of the inner ear that causes severe dizziness (vertigo), ringing in the ears (tinnitus), hearing loss, and a feeling of fullness or

congestion in the ear. Attacks of dizziness may come on suddenly or after a short period of tinnitus. In addition to some people with Ménière's disease have vertigo so extreme that they lose their balance and fall. These episodes are called "drop attacks." In this context, **American Academy of Family Physicians (2019)** [24] who concluded that, Meniere's disease is a chronic (ongoing) problem.

Concerning the relation and correlation between studied patients' quality of life domains and their severity of Meniere's disease. The current study findings portrayed that there were significant negative impacts of MD on the majority of study patients' quality of life aspects as well as highly statistically significant associations between disease severity and patients' poor QOL. Moreover, the present study revealed that as the degree of disease severity is increased; as the studied patients with MD had poorer QOL in overall quality of life and all of domains including physical, psychological and environmental except the social domain.

Similarly, **Söderman et al., (2015)** [14] who found that, the Meniere's patients experienced a worse quality of life than

did healthy subjects. Vertigo mainly influenced the physical dimension, whereas tinnitus and hearing loss influenced the psychosocial dimension. Sense of coherence had an impact on the psychosocial dimension.

Also, these findings are in agreement with **Tyrrellet al. (2017)** [25]who explained that each of the main triad of Meniere's symptoms can impact on quality of life. Tinnitus may be associated with sleep disturbance, depression, anxiety, irritability, reduced concentration and auditory difficulties. However, the current study findings differ from their findings in that, the majority of their studied patients had associations between their poor QOL and social relationships because the hearing loss can result in communication difficulties, which can cause problems in work and social life. These results could be related to the disease restrictions on physical activity due to dizziness and vertigo which might have led to restrictions on activities [26]. No doubt poor psychological and emotional status might be related to the functional problems, disease chronicity and the loss of hearing which develop fear and lose confidence to have conversations with others or at work, which can

contribute to depression or anxiety. In the same context, **Petri et al. (2017)** [27]**, Weidt et al. (2014)** [28]**and Porter and Boothroyd (2015)** [29] who reported that, higher level of dizziness, vertigo, and depression in these patients had a negative effect on QOL of MD patients.

Furthermore, the present study results revealed that, the studied patient who had poor quality of life were females, had low educational level, were unemployed, married, rural residents and had insufficient income. Moreover, there was a statistically significant relation between quality of life scores of the studied patients and all of their socio-demographic characteristics except the marital status.

These results were in line with **Orji (2014)** [30] in which, their results indicated that 63% of the Meniere's patients showed psychopathology such as anxiety and depression. In considering the duration of the illness, the patients who were longer affected by the disease had significantly more daily stressors, worse physical and social functioning, and more bodily pain. In addition, these findings were congruent with the result of **Söderman et al. (2019)** [31] who concluded that, Being exposed to emotional stress

increases the risk of getting an attack of Meniere's disease during the next hour, and the hazard period is possibly extended up to 3 hours.

Conclusion

Based on the findings of the present study, it can be concluded that, the majority of the studied patients with Meniere's Disease had overall poor quality of life related to physical, psychological, social, environmental domains. Furthermore, there was a statistically significant relation between quality of life scores of the studied patients and all of their socio-demographic characteristics except the marital status. So, it can be said that Meniere's disease affect patients quality of life.

Recommendation

Based on the findings of the present study, it can be recommended that:

- More attention should be taken from departments head nurse about nurse's assessment of patients' quality of life who had Meniere'sdisease.
- Standard of nursing care should be developed to improve the patients' who had Meniere's diseaseQOL.
- Rehabilitation programs are required to enhance patient's with Meniere's disease coping

mechanisms.

- More research should be carried out in different areas in Egypt, to acquire more global understanding of the impact of Meniere's disease on patients'QOL.

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