

# The Influence of Psychological Factors in Meniere's Disease

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## Abstract

Many physicians have observed that psychological factors play a significant role in the course of Meniere's disease (MD), with Meniere's patients being subject to anxiety and tension states. A lot of research attentions from a psychological point of view have been directed at MD, with earlier researchers focusing on psychosomatic causes of the illness as well as its somatopsychic result. However, the question whether MD is caused by psychological factors or whether the psychological manifestation in MD is as a result of the illness is still unresolved. The aim of this study is to provide an overview of interaction that exists between physical and emotional factors in the development of MD and its impact on the quality of life of the sufferers. A structured literature search was carried out, with no restrictions to the dates searched. A vicious circle of interaction seems to exist between the somatic organic symptoms of MD and resultant psychological stress. The frightening attacks of vertigo seem likely to produce and increase the level of anxiety thereby worsening the emotional state and the resultant anxiety provokes various symptoms probably through disorders of the autonomic nervous system occasioned by the increased levels of stress-related hormones.

**Keywords:** Meniere's disease, Physical and emotional interaction, Psychosomatic cause, Quality of life, Somatopsychic result

## Introduction

Meniere's disease (MD) is an inner ear disorder, characterized by stressful disabling symptoms complex of spontaneous episodic vertigo, sensorineural hearing loss, tinnitus and aural fullness.<sup>[1-3]</sup> The disease is chronic and its etiology is still unknown. However, the endolymphatic hydrops is the most common pathophysiologic correlate.<sup>[4,5]</sup> A number of otolaryngologists have long accepted the notion that patients with MD are subject to anxiety and tension states and that this stress can aggravate the symptoms already present. They have observed that psychological factors play a more important role in the causation and the course of MD, as well as its impact on the quality of life (QOL) of sufferers than is commonly realized.<sup>[5-8]</sup> In a large number of MD patients, the first set of attacks of vertigo and later tinnitus and deafness have been

observed to follow definite underlying life stressful intolerable situation with an explosive outburst of backing up of tension. Such life stresses have been reported as death of near relatives, conflicts centered around sexuality, abnormal avoidance of sex relationships especially among males, situations of antagonism to some individual or group important to the patient's welfare and various other life stresses.<sup>[6]</sup> In view of these observations, MD has received a lot of research attention from a psychological point of view. Researchers have earlier evaluated the psychosomatic theory of the disease in which they recognize that the symptoms of MD have an organic basis, but its causes were sought in psychosocial stressors and the inability of the patient to cope with stress.<sup>[5-7,9]</sup> On the other hand, somatopsychic theory of the disease has also been explored in which psychological disturbances associated with MD are believed to be the consequences of the disease process rather than the cause of the disease.<sup>[10-18]</sup>

Whether the disease or the psychological condition comes before the other, remains unresolved and is probably not as important as understanding how the emotional and physical factors interact in MD. In other words, are there indications that interactions of certain specific emotional stressful situations, acting on a predisposing personality structure, play a role in producing the disease? In this review, an overview of the

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concept of interaction between the somatic factors in MD and its psychological aspects as it affects the disease's impact on the daily life of sufferers is presented.

## Materials and Methods

A wide literature search of PubMed, African Journals Online, Health Internetwork Access to Research Initiative and ovid with no date restriction was conducted with the keyword MD. The search engines returned 7047 related articles on MD. Further filtration yielded 73 articles on "psychological factors and QOL." Extracted materials spanned between 1970 and 2010. Data from the studies were extracted and assessed for inclusion. A total of 33 studies were identified and thoroughly read. All 26 articles were prospective cohort cross-sectional studies, while two of the studies were retrospective review of Meniere's patient treated in a tertiary institution. Four of the studies were systematic literature review articles.

### Interaction between psychological and somatic factors in MD

In a study that reviewed the psychological aspect of MD, Van Crujjsen *et al.*<sup>[8]</sup> conducted a chronological review of studies concerning the psychosomatic and somatopsychic hypotheses in MD and the combined hypotheses. They held a position that psychosomatic factors do not represent the exclusive etiologic cause of MD and that even when a somatopsychic factor seems to be present, it also does not provide the sole explanation. They suggested that the process may constitute a vicious circle: Symptoms of the disease may worsen the emotional state, which in turn may worsen the symptom perception. The authors concluded that a continuous interaction between psychological, somatic and environmental factors would be considered in interpreting this complex process.

Similarly, other studies have evaluated the interaction between psychological stress, behavioral characteristics and symptoms of MD and concluded that they produce a vicious circle.<sup>[13,19,20]</sup> In one of the studies, a questionnaire was devised to analyze life-style and behavioral characteristics in 60 MD patients compared with 936 healthy controls. The MD patients were shown to have a significantly greater stress-causative tendency in behavioral characteristics, felt stronger anxiety and presented more severe symptoms incidental to this anxiety compared to the controls. The behavioral characteristics of escape were found to be psychosomatically very harmful. It was suggested that the behavioral characteristics in MD patients, being more stress-causative than in normal controls, may play a role in the genesis of endolymphatic hydrops, possibly through stress-related hormones.<sup>[20]</sup> Earlier studies have shown that the plasma levels of stress-related hormones such as antidiuretic hormones and catecholamines are elevated in conditions of endolymphatic hydrops including MD. These hormones were believed to alter the inner ear fluid dynamics, thereby producing auditory and vestibular dysfunction and the symptoms experienced in MD.<sup>[21-23]</sup>

More recently, Van Crujjsen *et al.*<sup>[5]</sup> in 2006 conducted a psychological assessment of 110 MD patients and 26 controls suffering from other chronic illnesses such as acoustic neurinoma, otosclerosis, neuritis vestibularis, ototoxicity, benign paroxysmal positional dysfunction, migraine, hereditary hearing loss and partial epilepsy. They aimed to evaluate how psychological, physical and environmental factors in MD interact and why one patient develops more frequent and severe problems after getting MD than others. The authors utilized multiple validated questionnaire instruments, which included: The "daily hassles list," which quantifies the frequency and intensity of problems in different circumstances, "coping inventory," which was designed to assess coping with stressful situations, the five personality domains of: Neuroticism, extraversion, openness (NEO) to experience, altruism and conscientiousness were assessed with the "NEO five factor inventory," the "symptoms checklist" was designed to measure physical and psychological complaints, the "general health questionnaire" was designed to screen for minor psychiatric disorders in the general population and the "medical outcome short form health survey" which assessed well-being and functional status (QOL). The authors found that Meniere's patients experienced more daily hassles as well as more psychological and physical problems compared with the normative values and were less task-oriented in their way of coping with stressful situations. 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. However, when authors compared the psychometric results of the Meniere's patients and the results of the control (patients with other audio-vestibular diseases), they found no significant difference in any of the psychological test results and then suggested that the psychopathology seems to be the result of having a chronic disease.

Similar studies compared the psychological characteristics of Meniere's patients who had been diagnosed as such by otologists with two groups of non-Meniere's patients: Those with otologic disorders who did not have vertigo and those patients with diverse otologic disorders but who had in common vertigo as a symptom. When MD patients were compared with non-vertiginous patients, the psychological profile of the Meniere's patients put them clearly as emotionally damaged. However, when the Meniere's group was compared with the non-Meniere's vertiginous group, the difference was found to be washed out and the groups were very much alike psychologically. It was reasoned that since the non-Meniere's vertigo group had, in large measure, identifiable organic disease, the similar psychological picture that emerged when compared with the Meniere's group, was understandably believed to be the response to the disease rather than its cause. Authors concluded that the culprit responsible for the psychological picture observed MD seem to be vertigo

and added that any illness that has a symptom as disabling as vertigo can produce its own form of psychopathology.<sup>[11,16]</sup>

The results regarding personality aspects in MD remained contradictory. Sawada *et al.*<sup>[23]</sup> did classify the personality structure of MD in the normal range. Similarly, Van Crujisen *et al.*<sup>[5]</sup> found no abnormal personality traits in Meniere's patients compared with the values of their controls. On the contrary, Groen<sup>[7]</sup> documented that MD patients exhibit a specific personality structure, characterized by high intelligence, great diligence and a strong sense of duty. Savastano *et al.*<sup>[18]</sup> described MD patients as obsessive-compulsive persons, perfectionists and neurotics, who are supposed to be more vulnerable and have more stress exposure. In a study that examined the psychological profile of MD, Meniere's patients were reported to exhibit anxious and depressive personality.<sup>[24]</sup> In a study in which questionnaires were devised to analyze the life-style and behavioral characteristics of MD patients and a large control population, Takahashi *et al.*<sup>[20]</sup> documented that patients with MD had nervous and scrupulous personalities and possessed more stress-causative tendencies in behavioral characteristics compared with the control group. De Valck *et al.*<sup>[25]</sup> found a type-D personality is more prevalent in 29 MD patients compared to 59 other patients with a peripheral vestibular disorder experiencing vertigo. They also documented that, subjects with a type-D personality feel more handicapped due to their vertigo symptoms than non-type-D subjects. Similarly, it was hypothesized in two separate studies that patients with psychological distress might perceive a stronger rotational vertigo and unsteadiness than patients in a normal mood.<sup>[26,27]</sup>

### QOL perception in MD

Ordinarily, people encounter many episodes that may be physically and psychologically causative of stress in their day to day experiences. Even such episodes that are seemingly similar may give different impacts on different people, since their individual behaviors and sensitivities to stress may differ. In MD which is a chronic condition, a patient's life will understandably change considerably, especially in view of its tendency to involve the contralateral ear in the course of time and the fact that the course of hearing loss is not altered by any form of treatment.<sup>[28,29]</sup> The concept "QOL" has been defined as the individual's perception of his/her position in life in the context of the culture and value system in which they live and in relation to their goals. Thus, QOL has been analyzed in three separate domains: Physical; psychological; and environmental. The physical component refers to the physical effects of the disease, i.e. pain, fatigue or vertigo, while the psychological domain has been related to an individual's mood in a global sense, e.g. fear or depression. The environmental domain has been evaluated from two different perspectives: Social participation and role activities.<sup>[8,14,15,25,29-31]</sup>

Anderson and Harris<sup>[14]</sup> evaluated the impact of MD on the QOL using several general outcome instruments.

These included the quality of well-being scale (measured a point-in-time expression of wellness and specifically, the daily effects of many symptoms related to MD in terms of functional status), the medical outcomes study SF-12 (measured both physical and mental scores) and the Center for Epidemiologic Studies-depression scale (produced a measure of psychological depression). Their quality of well-being scale results indicated that patients with MD are severely incapacitated by their illness and in acute episodes; MD seems to be one of the most debilitating diseases compared with people who survive other debilitating illnesses. The mean Center for Epidemiologic Studies-depression scale score of patients with MD was comparatively worse than the scores of patients who were hospitalized for trauma, who were shown to be depressed as a result of serious injury as well as patients with cochlear implants. They concluded that all outcome instruments indicated that MD is serious in its physical and mental health consequences on the sufferers and that the days with acute episodes of MD symptoms are significantly worse than the days without such symptoms.

Van Crujisen *et al.*<sup>[5]</sup> documented poorer QOL scores among the 110 Meniere's patients compared with normative values, with their patients showing more limitations due to their restricted physical functioning as well as showed a worse general health perception and poorer social functioning with less vitality. Authors also found that the QOL was significantly worse in patients with more severe symptoms. They however reported coping strategies and the frequency of daily stressors to be the same in the low and high severity symptom group. It was suggested that the severity of the symptoms has more effect on the QOL, than coping or daily stressors in MD.

Kinney *et al.*<sup>[29]</sup> investigated the long term effect of MD on hearing and QOL in 51 selected Meniere's patients who were at least 1 year post treatment using validated disease specific QOL measure questionnaire designed to quantify the hearing loss, tinnitus and dizziness handicap. These included "hearing handicap inventory for adults" designed to evaluate the emotional and social consequences of hearing impairment; the "dizziness handicap inventory" assessed the functional, emotional and physical consequence of dizziness; the "tinnitus handicap inventory"; and the "SF-36 health survey," which assessed physical functioning, role limitations, social functioning, bodily pain, general mental and general health perception. They found that the emotional aspect of MD was more handicapping than the physical components. Authors concluded that patients with MD have more emotional disability than physical disability.

The influence of vertigo, hearing impairment and tinnitus on the daily life of Meniere's and non-Meniere's patients has also been studied. Söderman *et al.*<sup>[31]</sup> found that MD patients experience a bad QOL and they indicated that vertigo is the most influencing factor on the major implications of this disease on their daily lives.

Cohen *et al.*<sup>[15]</sup> investigated the influence of these symptoms on the QOL of 51 MD patients who filled in a self-administered questionnaire designed to investigate the physical, psychological and environmental domains of the QOL. The authors found that vertigo is the most bothersome symptom influencing a subject's performance at work, followed by hearing loss. This however contrasts with the results of a study designed to investigate the influence of vertigo, hearing impairment and tinnitus on the daily life of 514 MD patients in which the subjects reported most discomfort from tinnitus. However, the results also showed that these 3 major symptoms had a strong negative effect on the daily life of MD patients, with 75% of the subjects avoiding certain everyday activities or situations because of the disease. More than half of the subjects were reported to have stated that they never felt free of discomfort from the illness, even though 36% gave examples of situations in which they felt free of the discomforts of the symptoms of MD such as: Being on holiday, being in the country-side, being at home alone, being on diets, when flying and when doing sports activities.<sup>[32]</sup>

The impacts of vertigo attacks on the QOL of non-Menièrè's vertiginous patient and in comparison with Menière's patients have also been evaluated. Bamiou *et al.*<sup>[33]</sup> documented higher disability and handicap score among patients with a unilateral vestibular disorder after excluding MD, than the normative values. In a study that compared the level of psychological distress and disability in groups of patients with vertigo, the researchers reported that patients with only vertigo experience the same level of anxiety, depression and somatic complaints compared with Menière's patients. It was concluded that vertigo impacts negatively on the QOL of sufferers regardless of the pathology<sup>[17]</sup> De Valck *et al.*<sup>[25]</sup> evaluated the level of handicap exhibited by 5 pathological groups of 88 vertigo patients which included 29 Menière's patients, using the "Dizziness Handicap Inventory." The non-Menièrè's groups that were also evaluated include: Benign paroxysmal positional vertigo (BPPV) of the posterior semicircular canal (23), vestibular neuritis (8), vestibular schwannoma (20) and post-traumatic non-BPPV vertigo (8). They reported high handicap score in all the 5 groups, even though those with type-D personality had higher scores.

Thus, in MD the frightening attacks of vertigo seem likely to produce and increase the level of anxiety thereby worsening the emotional state and the resultant anxiety provokes various symptoms probably through disorders of the autonomic nervous system occasioned by the increased levels of stress-related hormones. Hence, a vicious circle of interaction between somatic organic symptoms of MD and resultant psychological stress develops. Understandably, those with predisposing psychological personality characteristics are more likely to suffer more impact of this vicious cycle on their QOL than Menière's patients whose personalities are in the normal range.

## Conclusion

In MD, there seem to exist a vicious circle of interaction between the somatic symptoms especially vertigo and resultant emotional disturbances, which in turn tend to provoke some other somatic symptoms. The QOL of the sufferers is severely incapacitated by the illness, especially the psychological well-being, which manifest mainly with anxiety and depression, dominating the physical and environmental disturbances. Worse QOL tends to occur in Menière's patients with more severe vertigo symptom.

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