Clinical Forum

Psychological Status of Patients Undergoing Electronystagmography

Lynn S. Alvord

Abstract

Dizzy patients undergoing electronystagmography (ENG) often express stressful life situations, anxiety, and other adverse psychological states. Many past studies have dealt with the interrelations among actual vertigo (or less specific dizziness) and various psychological factors. The present study compares results of a psychological screening questionnaire, the State-Trait Anxiety Index, between vertiginous patients undergoing ENG, and nonvertiginous patients undergoing another diagnostic test, auditory brainstem response (ABR), for complaints other than dizziness. A second age-matched control group consisted of subjects without medical complaints. Results showed that the ENG group have a significantly greater degree and prevalence of adverse psychological state than either control group. These results, while not indicating whether vertigo is the cause or effect of such states, do indicate the high prevalence of psychological morbidity among the comparatively mildly dizzy patients typically encountered in ENG testing. Greater attention to the psychological aspects of the dizzy patient is indicated.

Key Words: Vertigo, psychogenic, somatopsychic, electronystagmography (ENG), psychological status

A vast body of medical and psychological literature exists dealing with the effects of the mind on the body. Classic examples of so-called "psychosomatic" illnesses are stress headaches and gastrointestinal disorders (Chapman, 1976). A similarly large body of literature deals with the "somatopsychic" disorders whereby organic disease may generate disturbing psychological disorders such as anxiety and depression (Winokur and Clayton, 1986).

The subject of dizziness has received considerable attention in regard to its interrelations with psychological factors. Both non-specific "dizziness" and more strictly defined "vertigo" have been reviewed and debated as being either the result of adverse psychological state (as in "psychogenic vertigo") (Stewart, 1898; Jelliffe and White, 1929); or its cause, i.e., true organic vertigo resulting in adverse psychological states (Cawthorne, 1957a; 1957b; Pratt and McKenzie, 1958). Of these two possibilities, the former has experienced the greatest controversy. This controversy generally is centered on whether "true vertigo," defined as an "illusion of motion" (Ludman, 1981), can be caused by purely psychologic factors. That it can be, is purported in a recent review by Trimble (1984). That it cannot be, or at least has not been shown to be, is the conclusion of a similar review by Jakes (1988).

Notwithstanding this controversy, there appears to be general agreement that at least the symptom of nonspecific "dizziness" is frequently encountered in purely psychological cases and in fact, is a commonly reported symptom of anxiety, mania, hyperventilation syndrome (Cappon, 1970; Nilsson et al, 1979); masked depression, bereavement, hysteria, agoraphobia (Trimble, 1984); and panic disorder related to post-traumatic stress or phobias (Katon, 1986).
Since the late 1800s, “psychogenic vertigo” or dizziness has been recognized and discussed by such authors as Freud (1895), Moore and Atkinson (1958), and Rallo (1972). Explanations of “psychogenic vertigo,” including less specific dizziness, are usually based either on theories of conversion reaction in which suppressed or inadequately handled feelings may manifest themselves as physical symptoms such as headaches, nausea, vertigo, etc., or theories of concomitancy whereby vertigo merely accompanies stress or anxiety (Magnusson et al., 1977). Elaborations of these psychosomatic models have ranged from the purely psychoanalytic (Schilder, 1939) to the more concrete physiologic whereby nuclei of the psycho-sympathetic nervous system and vestibulo-cerebellar systems are closely associated anatomically in the brainstem (Schilder, 1933, 1935).

It has also been postulated that a vicious cycle can occur in which organic and psychologic disorders may co-exist, each encouraging and feeding the other (Hinchcliffe, 1967a). Such relationships have been expounded in the well-known works dealing with psychological factors of Meniere’s disease. Evidence for psychosomatic disorders, somatopsychic disorders, and combinations of the two are found in these works. (Fowler and Zeckel, 1952, 1953; Pratt and McKenzie, 1958; Hinchcliffe, 1965, 1967b, 1967c; Stephens, 1975; Crary and Wexler, 1977; Hallam et al, 1983; Hallam and Stephens, 1985). Perhaps most impressive among such studies is the work by Thomsen et al (1981) in which a strong surgical placebo effect was seen among patients receiving sham endolymphatic shunt operations.

**PURPOSE**

Although relationships have been demonstrated in which either severe psychological impairment causes dizziness or conversely, severe vertigo causes anxiety and depression, data do not exist for the general ENG population for whom symptoms are often less severe and causes less than obvious.

There are several reasons to suspect such a population may exhibit an adverse psychological state. In the realm of the somatopsychic, patients undergoing electronystagmography (ENG) often have experienced their symptoms for a lengthy period of time and may have undergone numerous laboratory and medical tests prior to referral to the otolaryngologist or audiologist. Worry over outcome of such tests and anxiety concerning an unknown medical condition is often expressed.

There is also reason, in some cases, to suspect a psychogenic origin for a particular patient’s symptoms of dizziness. During the lengthy ENG exam, patients often express life problems, agitation, or having undergone a significant life change (loss of job, divorce, change of residence, etc.). Such revelations in the absence of positive findings may lead to suspicion of psychological cause or overlay.

In view of these considerations, we were led to examine the psychological state of a group of typical vertiginous patients undergoing ENG examination compared to nonvertiginous patients undergoing another diagnostic examination of similar length and importance, namely auditory brainstem response (ABR). While such a study will not determine whether adverse psychological state is the cause or effect of vertigo, evidence of adverse psychological status in such patients would serve as a starting point for further study and provide basis for individual psychological referral.

A second purpose of this report is to briefly review common symptomatology for stress and anxiety states, thereby providing background for appropriate psychiatric referral when indicated.

**METHOD**

A self-administered psychological examination was given to those referred for ENG for symptoms of “vertigo,” defined as an “illusion of motion” (Ludman, 1981), and two control groups, one consisting of subjects referred for ABR testing, the other consisting of “normal” subjects. Previous studies dealing with psychological aspects of vertigo have either used no control group, or used as control a pathology with less potential for emotional involvement such as otosclerosis (Hinchcliffe, 1967b).

**Subjects**

Subjects consisted of 39 adults distributed among the following groups, which were matched for sex and for age (within 10 years).

**ENG**

Thirteen subjects undergoing ENG for symptoms of vertigo participated. Diagnoses, as specified by the attending otolaryngologist, were found to be distributed among a variety of
Patients Undergoing ENG/Alvord etiologies at the following approximate distribution: unknown, 34.6 percent; Meniere's disease, 27 percent; viral labyrinthitis, 7.7 percent; functional, 7.7 percent; central vestibular, 7.7 percent; arteriosclerosis, 3.8 percent; benign positional vertigo, 3.8 percent; vestibular neuronitis, 3.8 percent; labyrinthine contusion (post-trauma), 3.8 percent.

**ABR**

Thirteen subjects undergoing ABR for complaints other than dizziness participated. Most common reasons for testing were tinnitus and unilateral hearing loss (suspicion of acoustic tumor). This group was chosen because it was perceived as involving a similar degree of apprehension over the test and general health condition. Resulting diagnoses for this group remained as "unknown" for most cases (92.3%). One subject (7.7%) was found on MRI to have a unilateral acoustic neuroma. Presenting complaints were distributed as follows: tinnitus, 38.5 percent; asymmetric hearing loss, 30.8 percent; tinnitus and asymmetric hearing loss, 15.4 percent; vague lightheadedness, 7.7 percent; ear pressure, 7.7 percent.

**"Normal"**

Thirteen normal subjects (without health complaints) participated. No medical test was given.

Mean ages of Groups 1, 2, and 3 were 45.9, 47.6 and 47.2 years respectively.

Subjects in the ENG and ABR groups were chosen sequentially as they were referred to one of two large Otolaryngology/Audiology Clinics in the Salt Lake City area. Subjects for the Normal group were chosen from among local manufacturing-retail outlet employees and university students.

Subjects responded to the psychological self-evaluation questionnaire just prior to administration of the ENG or ABR.

**Psychological Test Instrument**

The psychological test employed consisted of form X-2 of the State-Trait Anxiety Index (STAI), a self-administered questionnaire consisting of 20 questions. This instrument has been shown to be a reliable indicator of long-term general emotional state with particular emphasis on factors commonly associated with dizziness, namely stress and anxiety (Spielberger et al, 1970). Questions on the STAI require the subject to rate how much of the time he or she feels the manner indicated. For example, responses of "almost never," "sometimes," "often," or "almost always" are chosen for either negatively worded phrases ("I feel blue") or positively worded phrases ("I feel secure"). Written instructions specify that the subject respond the way he or she "generally feels." Each of the 20 questions receives 1 to 4 points with the higher points assigned to the least favorable responses. For example, for the phrase, "I feel blue," the response "almost always" received 4 points. A positively worded phrase "I feel secure" responded to with "almost always" would receive only 1 point. Therefore, the lower the total points on the STAI, the greater indication of normalcy. The reader is referred to the test manual for more detailed instructions and description of the test.

**RESULTS**

Table 1 shows raw score data, mean, range, and standard deviation of the STAI for the three experimental groups. As shown, the highest mean score (most abnormal) was found in the ENG (dizzy) group, followed by the ABR (nondizzy) and finally the Normal group. Analysis of variance showed a significant difference between groups (F = 8.52; p < 0.01). A Newman-Keuls Range Test post-hoc, showed each group to be significantly different from the others (p < 0.05). Mean STAI score for the ENG group (47.8) was more than two standard deviations higher (worse) than the mean for the Normal group (31.5). Seven of the top ten (most abnormal) scores were found among the ENG group (two scores tying). The remainder of the top ten scores were found among the ABR group.

To further describe the results, STAI scores were considered abnormal if they fell outside two standard deviations of the Normal group. Using this conservative definition, the following percentages of individuals were found to possess abnormal STAI scores in each group: 7.7 percent of the Normal group, 30.8 percent of the ABR group, and 53.9 percent of the ENG group. It is also noted that the highest and second-highest (most abnormal) STAI scores were found in the ENG group.

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<th>Table 1 Psychological Index Scores (STAI)</th>
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DISCUSSION

Our group of ENG (dizzy) patients showed significantly greater degree and prevalence of adverse psychological state than the two control groups. As stated, the STAI primarily tests for anxiety, stress, worry, and apprehension, qualities previously most commonly associated with the symptom of dizziness. Other conditions associated with dizziness, such as agoraphobia, panic, and masked depression, are not tested for directly by the STAI.

It should be noted that the average score of the ABR group was also significantly poorer than the Normal group, but significantly better than the ENG group. It appears, therefore, that the stress of a serious diagnostic test and/or worry over current medical condition can affect mental state to some extent. It has been previously reported that 30 to 60 percent of inpatients of medical wards have psychiatric symptomatology (Lipowski, 1967). In our sample, 30.8 percent of the ABR group members were adversely affected enough psychologically to show abnormal STAI scores. Average scores of the ENG patients, however, were significantly worse than those of the ABR “controls.”

We recognize that these results, while showing high prevalence of adverse psychological state, do not determine whether dizziness is the cause or effect of such states. It is possible that either situation is represented within the sample in individual cases. In a carefully controlled study, further light may be shed on this question by a comparison between scores of those with normal and abnormal ENG. The assumption would be that if many of the subjects with normal ENGs (presumably having no organic basis for their complaints) were found to possess high scores of psychological abnormality, evidence for a psychological cause would exist. Such assumptions are somewhat tenuous, however, since a normal ENG would then have to guarantee absence of organicity. In addition, presence of nystagmus on the ENG would need to be unrelated to purely psychological factors. Both of these assumptions have been refuted to some extent in the previous reviews cited. In other words, there is little evidence to suggest that a normal ENG rules out all organic deficits. On the other hand, there is some evidence that vertigo, and presumably nystagmus, are capable of being psychologically induced (Trimble, 1984; Jakes, 1988).

Psychiatrists often feel that a differentiation between psychologically induced true “vertigo” and less specific “dizziness” can be made simply by history and the presence or absence of nystagmus. The assumption is that organic or “objective” vertigo exhibits nystagmus and a clear history of feelings of motion. Such distinctions are often difficult in practice, especially when dealing with the mildly dizzy patients often encountered. Proving whether adverse psychological state is cause or effect is a difficult challenge for psychologists considering the many variables that would need to be controlled.

The immediate significance of the data presented here is the demonstration of the high prevalence of an adverse psychological state among “typical” ENG patients. Greater sensitivity to such problems should lead to consideration of the patient’s overall problem(s), including appropriate psychological referral when necessary. Recognition of adverse psychiatric symptoms is an important aspect of proper patient management. Most patients experiencing such problems are aware of such symptoms and respond to direct inquiry (Grosser, 1990). A tactful inquiry such as “Are you experiencing undue stress or anxiety in your life?” may be included in the history along with the usual questions. Other symptoms of acute anxiety include unexpected fear or discomfort, shortness of breath (dyspnea) or a smothering sensation, palpitations or accelerated heart rate, trembling or shaking, sweating, choking, nausea or abdominal distress, paresthesias, hot flashes or chills, chest pain or discomfort, fear of dying, and fear of going crazy or doing something uncontrolled (Greist and Jefferson, 1988). Since many of these symptoms share commonality with other organic disorders, proper referral is always indicated.

CONCLUSIONS

In summary, a high percentage of ENG patients were found to have abnormally high scores of an adverse psychological state. In particular, the STAI scores of this group indicate high levels of stress and anxiety. Whether such manifestations represent cause or effect cannot be ascertained by this study. Past reviews list dizziness as a common symptom of a variety of psychological disorders, primarily anxiety and stress. A theory, therefore, exists in the psychological realm for “psychogenic vertigo.” By contrast, it has also been reported that true organic vertigo can be the cause of adverse psychological states thus displaying a “somaticpsychic” effect.
The high prevalence of an adverse psychological state found in this sample indicates the need for greater awareness of psychological manifestations among dizzy patients. Recognition of common symptoms and inclusion of questions regarding psychological state, or administration of simple screening tests such as the STAI, are considered positive steps in this direction.

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REFERENCES


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