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Running head: CHRONIC SUBJECTIVE DIZZINESS VS. CONVERSION DISORDER

Chronic Subjective Dizziness (CSD) vs. Conversion Disorder: Discussion of clinical findings
and rehabilitation

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Abstract

Purpose: Audiologists frequently encounter patients who complain of chronic dizziness or imbalance, in the absence of active vestibular or neurological deficits. Knowledge about conditions that cause this clinical presentation will allow audiologists to make important contributions to accurate diagnosis and effective management of these patients. This article reviews two such conditions, chronic subjective dizziness (CSD) and conversion disorder.

Method: A case of CSD and another of conversion disorder are presented with a literature review of their clinical presentations, key diagnostic features, and treatment strategies. The role of the audiologist in assessing patients with these conditions and facilitating appropriate treatment referrals is discussed.

Conclusions: The audiologist is in a key position to identify individuals with CSD and conversion disorder, two conditions that can be effectively managed if properly recognized. The authors demonstrate an effective team-approach program that includes the audiologist's contribution to differential diagnosis, education of patients and other clinicians about these conditions and development of recommendations for neurologic, psychiatric, otologic, and physical therapy referrals.

Introduction

Dizziness is one of the most common complaints in primary care. Epidemiologic studies in the US and UK found that 20% of primary care patients seek medical attention for dizziness during their lifetimes (Kroenke & Mangelsdorff, 1989; Kroenke, Arrington, & Mangelsdorff, 1990; Yardley, Burgneay, Nazareth, & Luxon, 1998; Yardley, Owen, Nazareth, & Luxon, 1998; Nazareth, Yardley, Owen, & Luxon, 1999). For most individuals, dizziness is a temporary inconvenience, but 30% of dizzy patients have chronic or recurrent symptoms (Yardley, Burgneay, et al., 1998). They suffer from prolonged bouts of dizziness or unsteadiness that limit their work and home activities. One in ten patients with chronic dizziness (or about 1 in 200 medical outpatients) is functionally impaired by their symptoms (Nazareth et al., 1999). The diagnostic evaluation of patients with chronic dizziness typically focuses on otologic, neurologic, and cardiac causes, yet the balance symptoms of 30% of patients seen in tertiary neurotology centers cannot be explained by these illnesses (Staab, 2006). Outcomes for such patients are poor as they endure repeated unrevealing consultations and failed medical and surgical interventions. Often, they are relegated to the ill-defined categories of psychogenic dizziness or malingering.

Within the last decade, a new concept of chronic subjective dizziness (CSD) (Staab & Ruckenstein, 2007), and new interest in conversion disorder have paved the way to understanding patients who have chronic complaints of dizziness in the absence of active vestibular deficits. In this paper, we will compare and contrast these two conditions, outline appropriate referral patterns and treatment options, and identify the role of the audiologist in the team approach to management of these patients.

Chronic Subjective Dizziness

Medical writings from the 1870s provided the first recognizable indication that persistent dizziness could be caused by factors other than central or peripheral vestibular deficits (see Balaban & Jacob, 2001, for review). In the 1980s and 1990s, investigators in the US and Europe found that a group of patients with chronic dizziness consistently reported a core set of symptoms, including space and motion discomfort and hypersensitivity to visual motion stimuli (Bronstein, 1995, 2004; Jacob et al., 1993; Brandt, 1996). These symptoms were triggered by medical or psychological events that caused acute bouts of dizziness or imbalance (e.g., vestibular crises or panic attacks), but persisted long after the inciting events resolved. Building on these observations, Staab and Ruckenstein (2007) described a clinical condition known as chronic subjective dizziness (CSD) in 2007. They defined CSD as a syndrome of chronic non-vertiginous dizziness or subjective imbalance accompanied by hypersensitivity to motion stimuli and poor tolerance for complex visual stimuli or precision visual tasks, all occurring in the absence of active vestibular deficits. Patients with CSD may complain of constant sensations of wobbling or swaying when standing or veering when walking although they are not ataxic and rarely fall. Patients report increased symptoms in settings of complex visual stimuli such as grocery stores or shopping malls or when performing precision visual tasks such as reading or using a computer. Individuals with CSD are often referred to neurologists or otologists for comprehensive assessment, including audiological and balance/vestibular evaluation. The evaluations and assessments commonly reveal normal physical examinations, normal imaging of the brain, normal or non-contributory hearing loss, and normal or non-specific vestibular/balance exam or evidence of past fully compensated deficits (i.e. stable labyrinthine paresis; Staab &

Ruckenstein, 2007). As a result of these normal findings, patients with CSD may be dismissed as individuals with psychogenic problems or thought to be malingerers. This characterization ignores the established differential diagnosis of CSD and misses an opportunity for effective treatment.

CSD is associated with several medical illnesses, including migraine, traumatic brain injury, dysautonomia, and dysrhythmias, but patient complaints and functional limitations cannot be explained by these co-existing conditions alone. Anxiety appears to play a role in the pathophysiologic mechanisms of CSD, but diagnostic studies have not linked it to any specific anxiety or other psychiatric disorder. Thus, CSD appears to be a clinical condition that is related to, but separate from, other medical and psychiatric causes of dizziness. Its place in neurotology may be akin to that of irritable bowel syndrome in gastroenterology or fibromyalgia in rheumatology.

Conversion Disorder

Conversion disorder has been reported in the literature dating to Sigmund Freud when it was called hysteria. Conversion disorder has been classified as a somatoform disorder (Oyama, Paltoo, & Greengold, 2007) presenting with signs and symptoms affecting voluntary sensory or motor function that cannot be attributed to a medical condition even though it can be easily confused with a neurological disorder (Spratt & Thomas, 2008). Onset of conversion disorder can occur at any age; however it is most common in young adults (Gold & Friedman, 1995). It affects more women than men and is seen more commonly among individuals from lower socioeconomic strata. (American Psychiatric Association, 2000; Binzer, Anderson, & Kullgren, 1997).

Common manifestations of conversion disorder include: paralysis/parathesias, behavioral (non-epileptic) seizures, unusual walking patterns, unusual motor activities, and sensory disturbances including impaired hearing or vision (i.e. sudden blindness, deafness or muteness; American Psychiatric Association, 2000). Signs and symptoms can be alarming to clinicians as the patient may appear to be having a stroke or neurological disorder. However, some patients with conversion disorder do not seem overly concerned with their sometimes bizarre presentations. Freud coined the term “la belle indifference” indicating an indifferent and even cheerful response with respect to physical symptoms and outcomes (Stone, Smyth, Carson, Warlow & Sharpe, 2006).

Conversion disorder is thought to be triggered by a moderate to severe psychosocial stressor, usually one that involves a challenging psychological conflict. Patients with conversion disorder often have other co-morbid psychiatric disorders (i.e. panic disorder, anxiety, or depression) (Oyama et al., 2007). One-third of patients report a history of childhood physical and sexual abuse (Hong, Schonwald, & Stein, 2008). Please refer to Table 1 for current diagnostic criteria for conversion disorder as defined in the DSM-IV-TR. Diagnosis of conversion disorder is facilitated best by a team approach that includes both a neurologist and psychiatrist (Aybek, Kanaan, & David, 2008).

Case Reports

Two cases of chronic dizziness are presented here to illustrate the similarities and differences between CSD and conversion disorder.

Case 1 (CSD). Ms. A. is a 48-year-old, white female administrative assistant who developed an episode of subjective imbalance after a dental procedure in August of 2007. This resolved initially, but returned as a constant sensation of imbalance without vertigo. Ms. A reported increased symptoms in visually complex environments such as looking at a ceiling fan or walking in a grocery store. Due to her symptoms, she did not feel safe leaving her house and was terminated from her job. She worried incessantly over her symptoms, disability, loss of job, and responsibilities to her family. She had a history of migraine headaches with onset in her early 20's. Previous otologic and neurological evaluations including electronystagmography and audiometric evaluation conducted at outside facilities in 2007 and 2008 were normal.

Ms. A. was referred to our center for further evaluation. She underwent neurological examination, radiographic imaging of the brain, and audiological and balance function assessment (i.e. videonystagmography, rotary chair, computerized dynamic posturography and vestibular evoked myogenic potentials), which were all normal. The syndrome of CSD was identified by its core physical symptoms and medically unremarkable neurotologic assessment. Ms. A also presented with secondary anxiety and depression, which occurred after the onset of her dizziness. These were detected on the Hospital Anxiety and Depression Scale (HADS), a screening questionnaire (Zigmond & Snaith, 1983), and verified by psychiatric consultation. The HADS is routinely administered to all patients who undergo balance function tests in the Vestibular Laboratory at our institution, In Ms. A's case, CSD may have been triggered by dizziness associated with her migraine headaches. A selective serotonin reuptake inhibitors (SSRI) was prescribed for treatment of CSD plus co-existing anxiety and depression. Dietary modifications were recommended for migraine control. Ms. A was also referred to physical therapy for treatment.

A physical therapist trained in vestibular and balance rehabilitation therapy (VBRT) evaluated Ms. A and found normal balance on all static assessment measures (Romberg testing with eyes open and eyes closed, tandem Romberg, and one-legged stance). However, Ms. A. became symptomatic within 15 seconds of exposure to complex visual stimulation induced by a striped twirling umbrella (i.e. visual vertigo). Her rehabilitation plan included static balance activities (such as Romberg with eyes open and eyes closed) to help her build balance confidence. However, the primary focus of VBRT was habituation exercises to reduce visual vertigo and accompanying anxiety in visually complex environments. A walking program was recommended to gradually build her confidence and reduce symptoms when leaving her home. This consisted of gradual increases in time and intensity of exposure to challenging environments such as a shopping mall.

Case 2 (Conversion Disorder). Mr. B. is a 56-year-old white male who described a sudden onset of vertigo in July 2008 while tree-trimming. He felt better after resting, but his symptoms returned when he resumed physical activities and changed in character from episodic vertigo to persistent, non-vertiginous swaying sensations and imbalance. When Mr. B. presented to his primary care physician he had nearly constant motion of the torso and head in a large circular sway pattern. His spouse reported that these movements were mainly present when he was seated, but were absent while he was sleeping. Mr. B. also complained of numbness in his feet.

Shortly before the onset of his balance symptoms, Mr. B. had been treated for lymphoma. He was being medically cleared to return to work as a commercial truck driver, but was afraid that he had not recovered from his cancer and might experience a recurrence. Neither Mr. B. nor

his primary care physician felt safe with the prospect of him driving a truck after the onset of his balance symptoms, so he was placed on long-term medical leave.

Mr. B. was referred for neurological examination, radiographic imaging of the brain, and audiologic and balance function assessment. Extra care was taken to evaluate him for central nervous system deficits because of the possibility of brain or spinal cord metastases from his lymphoma. Neurologic consultation identified a mild peripheral neuropathy as the cause of numbness in the feet. His balance symptoms and constant, circular swaying of the head and torso were judged to be inconsistent with a neurologic deficit. A MRI of the head was normal. Audiologic assessment revealed bilateral, symmetrical, high frequency hearing loss. There was no indication of middle ear or retrocochlear involvement. Tests of basic balance function (i.e., oculomotor, positional, caloric, and rotary chair testing and vestibular evoked myogenic potentials) were normal. On the Sensory Organization Test (SOT) of computerized dynamic posturography, Mr. B. performed poorly on the easiest conditions and better on the more difficult conditions, a pattern that indicates a behavioral problem.

Psychological screening with HADS identified a clinically significant level of depression. The presence of unusual balance signs and symptoms, absence of neurologic, audiologic, and vestibular deficits, and positive screening results on the HADS prompted a referral for psychiatric consultation. On psychiatric examination, Mr. B. displayed a remarkable lack of concern for his debilitating balance symptoms (i.e., *la belle indifférence*). He acknowledged depression, which he attributed to his experience with cancer and inability to return to work. There were no other psychiatric findings. Mr. B. was diagnosed with a conversion disorder and secondary depression. The psychiatrist identified Mr. B's fears of a recurrence of cancer as the trigger for his conversion symptoms. His balance symptoms kept him in contact with his

physicians at a time when they were ready to transition him from intensive cancer care to routine follow-up. For treatment of conversion disorder, Mr B. was referred to physical therapy for a VBRT program. Psychotherapy was discussed, but he expressed little interest in this intervention.

The physical therapist's assessment revealed a persistent twisting motion of the torso on static balance testing. Mr. B. fell on one-legged stance and tandem Romberg with eyes closed, but his fall reactions were exaggerated and not consistent with a neurologic deficit. A VBRT program was initiated. Mr. B. was instructed to stand in the Romberg position twice daily with eyes open and eyes closed, staying a few seconds in each position, and then advancing to several minutes per exercise. This was supplemented with a short indoor walking program incorporating various head turns with each step. Safety was addressed by requiring Mr. B. to practice balance exercises in a safe place using support if needed at the beginning to reduce the risk of falls (e.g. holding onto stable furniture). The physical therapy program was advanced when specific tailored goals were met.

Discussion

These two cases of chronic dizziness expand the audiologist's differential diagnosis of balance problems that can occur in patients who have normal audiologic and vestibular assessments. They illustrate the syndrome of CSD and conversion disorder, identifying the core diagnostic characteristics and treatment strategies for each condition. Both patients reported sudden onset of dizziness and both felt unsafe performing usual social and work obligations. However, the presenting symptoms were vastly different. Ms. A (CSD) had debilitating, subjective sensations of dizziness, exacerbated by motion stimuli, but no abnormal movements.

Mr. B (conversion disorder) reported debilitating movement problems that were not consistent with a neurotologic deficit. In both cases, the differential diagnosis included neurotologic and psychiatric illnesses and the potential for complications from known conditions (migraine, cancer). Primary care and emergency room physicians are usually the first to evaluate patients with chronic complaints of dizziness. However, the breadth of the differential diagnosis (e.g., stroke, tumor, or degenerative neurologic condition such as Huntington's chorea) usually demands referral for specialty consultation and testing. Unfortunately, some patients may be dismissed without a firm diagnosis or referral because of their unusual presentations.

Both patients received thorough diagnostic work-ups. The common thread between these two patients was the persistence of balance complaints in the absence of active neurotologic illnesses. See Table 2 for summary of cardinal features, laboratory findings and treatment approaches for CSD and conversion disorder. Importantly, neither patient was feigning or malingering. Both presented with plausible and consistent symptoms that exemplified the core characteristics of their respective diagnoses. This was validated by the thorough evaluations of specialty clinicians, including audiologists, who were familiar with the signs and symptoms of CSD and conversion disorder. Published studies that have proposed one or more balance tests (e.g., the Sensory Organization Test) as diagnostic examinations for malingering have failed to include adequate clinical expertise and have raised suspicions of malingering in patients with identifiable vestibular or psychiatric disease and no ulterior motives (Mallison & Longridge, 2005; Staab, 2006). A primary role of the audiologist is to provide accurate test results. This may be followed by recommendations for neurologic, psychiatric, and otologic consultation, and VBRT if a physician has not already suggested it. Audiologists may also provide educational

information on various forms of chronic dizziness, including CSD and conversion disorder, to patients, colleagues, and referring sources as needed.

Both patients were referred for VBRT, a specialized physical therapy program for balance disorders and dizziness (Telian & Shepard, 1996). Several studies support the use of VBRT for patients with CSD (see Staab, 2006, for review). The primary goals of VBRT for patients with CSD are to reduce their hypersensitivity to motion cues and increase their confidence in their normal balance reflexes by exposing them to motion stimuli of gradually increasing complexity. Stimuli usually include a patient's own motion and the movement of objects in the environment, such as the twirling umbrella used by the physical therapist with Ms. A. As outlined by Telian and Shepard (1996), these habituation exercises are designed to reduce movement or position induced symptoms by systematically provoking the symptom, which desensitizes the patient's abnormally heightened response.

While there are numerous prospective controlled studies outlined in the literature supporting the efficacy and efficiency of VBRT for patients with symptom complaints of balance disorders and dizziness, there are no systematic studies of physical therapy intervention for conversion disorder. Case series (Ness, 2007) and case reports (Oh, Yoo, Yi, & Kwon, 2005) have demonstrated positive outcomes, including benefits for patients with gait problems and imbalance that patients with conversion disorder may display (Oh, et al., 2005). When balance symptoms are the major complaint in conversion disorder, VBRT provides a potential means of addressing sensory and motor impairment related to gait and balance dysfunction.

Many patients with vertigo and balance disorders, including those with CSD and conversion disorder, adopt sedentary lifestyles to avoid symptoms. Recommendations for a general exercise program may include a walking program suited to the patient's age, health, and

interests to further develop healthy life style changes. In general, all patients undergoing VBRT may benefit from education on fall prevention strategies. Balance confidence is particularly important for patients with chronic dizziness as these patients may experience avoidance behavior and anticipatory anxiety which prolongs and accentuates their symptoms over time.

Medication may serve as an additional management option for CSD. Five open label studies from the US and Japan provide evidence that selective serotonin reuptake inhibitors (SSRIs) are helpful for CSD (Ruckenstein & Staab, 2009). SSRIs specifically reduce dizziness in patients with CSD, not just anxiety or depression. At present, there are no medication treatments for conversion disorder. On occasion, conversion disorder resolves spontaneously but it can be a chronic disorder that is present for many years. Treatment of symptoms shortly after onset may be more effective than later interventions (Legaspi & Abad Venida, 2008). It is important to treat any co-morbid psychiatric disorders.

Cognitive behavioral therapy, a form of psychotherapy, may be helpful for CSD (Goldstein, Deale, Mitchell-O'Malley, Toone, & Mellers, 2004; Holmberg, Karlberg, Harlacher, Rivano-Fischer, & Magnusson, 2006; Staab & Ruckenstein, 2005) and conversion disorder (Allin, Streeruwitz, & Curtis, 2005; Speckens et al., 1995). The therapeutic approach helps to modify dysfunctional thoughts and beliefs that may be triggering symptom complaints (Dobson & Dozois, 2001). This form of therapy may be provided by psychiatrists, psychologists, or other licensed therapists with knowledge of this therapeutic approach.

Conclusion

CSD and conversion disorder result in distressing physical symptoms of dizziness and imbalance that may be effectively managed if recognized. In most cases of CSD, medical events such as vestibular crises or migraine trigger the initial symptoms of dizziness, which are then

sustained by conditioned hypersensitivity to motion stimuli and hypervigilance about motion environments. In conversion disorder, psychological factors such as recent stressors and internal emotional conflicts trigger and sustain symptoms. Both conditions can be treated successfully, reducing morbidity, social and economic consequences to the patient, and costs for misdirected medical care. A team-approach to diagnostic assessment, patient education, and treatment with VBRT and medications or psychotherapy as needed, can improve quality of life for patients and their families. The audiologist's primary role in the assessment of these patients is to identify characteristic symptoms and signs, and report accurate test results that place CSD or conversion disorder in differential diagnosis. A second role is to provide recommendations for neurologic, psychiatric and otologic consultation, if needed, and VBRT as appropriate. Finally, audiologists are in a key position to educate patients, their families, and professional colleagues on these disorders.

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Table 1: *Diagnostic Criteria for Conversion Disorder (DSM-IV-TR)*

1. One or more symptoms or deficits are present that affect voluntary motor or sensory function that suggest a neurologic or other general medical condition.
2. Psychologic factors are judged to be associated with the symptoms or deficit because conflicts or other stressors precede the initiation or exacerbation of the symptoms or deficit.
3. The symptom or deficit is not intentionally produced or feigned (as in factitious disorder or malingering).
4. The symptom or deficit, after appropriate investigation, cannot be explained fully by a general medical condition, the direct effects of a substance, or as a culturally sanctioned behavior or experience.
5. The symptom or deficit causes clinically significant distress or impairment in social, occupational, or other important areas of functioning or warrants medical evaluation.
6. The symptom or deficit is not limited to pain or sexual dysfunction, does not occur exclusively during the course of somatization disorder, and is not better accounted for by another medical disorder.

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Table 2: *Cardinal features of history, exam, laboratory assessment and management of CSD and conversion disorder.*

	CSD	Conversion Disorder
Cardinal features of clinical history	<ul style="list-style-type: none"> ● Persistent non-vertiginous dizziness or subjective imbalance ● Hypersensitivity to motion stimuli, including motion of self or surround ● Difficulty with complex visual stimuli 	<ul style="list-style-type: none"> ● Difficulty with standing walking or moving (problems with skeletal motor function) ● Sensory loss (hyperesthesia is less frequent) ● Symptoms usually have a pattern inconsistent with neuroanatomy or function
Neurological exam and radiographic imaging	<ul style="list-style-type: none"> ● Normal exam ● Non-diagnostic imaging studies ● Findings unexplained by neurotologic illness 	<ul style="list-style-type: none"> ● Motor and sensory deficits inconsistent with neuroanatomy (e.g., unusual gait and stance) ● Non-diagnostic imaging studies ● Findings unexplained by neurotologic illness
Vestibular laboratory findings	<ul style="list-style-type: none"> ● Normal or minor, non-diagnostic abnormalities ● Fully compensated vestibular deficit is possible 	<ul style="list-style-type: none"> ● Normal or minor, non-diagnostic abnormalities ● Fully compensated vestibular deficit is possible
Treatment options	<ul style="list-style-type: none"> ● Selective serotonin reuptake inhibitors (SSRIs) ● Cognitive behavioral therapy (CBT) ● Vestibular and balance rehabilitation (VBRT) 	<ul style="list-style-type: none"> ● No medications ● Cognitive behavioral therapy (CBT) ● Vestibular and balance rehabilitation (VBRT)