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The Use of Fall Risk Increasing Drugs (FRIDs) in Patients With Dizziness Presenting to a Neurotology Clinic

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Abstract

Objective—To characterize the use of fall risk increasing drugs (FRIDs) in patients with dizziness who presented to a Neurotology academic practice and to evaluate for predictors of FRID use in this population.

Patients—A total of 292 subjects presented with dizziness between July 1, 2013 and December 31, 2013.

Intervention—Demographic information and FRID use were recorded.

Main Outcome Measure—The prevalence and type of FRIDs (psychotropics, antihypertensives, and/or narcotics) used among participants.

Results—The overall prevalence of any FRID use was 40.8%. Thirty-nine percent of patients were on psychotropic medications, 37% on antihypertensives, and 8.2% on narcotics. The proportion of patients on two or more FRIDs at presentation was 34%. When categorizing by age group, 40% of patients aged 50 years or greater versus 24% of younger patients ($p = 0.004$) were on two or more FRIDs. With every decade increase in age, the odds of being on two or more FRIDs increased by 7%.

Conclusions—Forty percent of all patients presenting to a Neurotology Clinic for dizziness were on a FRID. Older patients were significantly more likely to be on multiple FRIDs, specifically antihypertensives and narcotic medications. These findings suggest that to fully assess and treat older patients with dizziness, the use of these medications should be evaluated.

Keywords

Falls; Medications; Vestibular dysfunction

Dizziness is a sensation of imbalance, lightheadedness, or vertigo. Dizziness affects over one-third of Americans age 40 years and above, and the prevalence increases with advancing age (1). Dizziness is associated with profound negative consequences for quality of life in both the functional and psychological domains (2). It may have several underlying and often coexisting etiologies, such as vestibular disorders, cardiovascular disease,

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metabolic derangements, orthostasis, psychiatric diseases, and multiple medication use (2–4).

The use of multiple medications (i.e., polypharmacy) contributing to dizziness is a particular concern among older individuals. A study in the ambulatory adult population age 65 or older found that 44% of men and 57% of women take five or more medications (5). An increase in the number of medications used in the elderly has been associated with an increased risk of impaired balance (6). Certain classes of medications, including antihypertensive, psychotropic (drugs acting on the central nervous system), and narcotic pain medications, have been associated with a particularly increased risk of dizziness and falls, and have been termed fall risk increasing drugs (FRIDs) (7–10).

The use of FRIDs in patients presenting to specialty Neurotology clinics has not yet been investigated. This study aimed to characterize the use of FRIDs in patients with dizziness who presented to an otolaryngology academic referral center, and evaluate for predictors of FRID use in this population.

PATIENTS AND METHODS

A retrospective chart review was conducted for all patients who presented to the department of Otolaryngology–Head and Neck Surgery with the chief complaint of dizziness between July 1, 2013 and December 31, 2013. This study received approval from the hospital institutional review board.

Study Population

Using the institution's electronic medical record, a query was made for all patients who presented to the institution for an outpatient evaluation of dizziness over a 6-month period (July 1, 2013 to December 31, 2013). Patients were included in the study if they were seen by a member of the department of Otolaryngology–Head and Neck Surgery for a new complaint of dizziness. A total of 292 patients were included in the study.

Variables and Outcomes

The electronic medical record was used to extract demographic information, diagnosis after clinic visit, and number and type of FRIDs at the time of presentation. The FRIDs were subclassified into antihypertensives, psychotropics, and narcotic medications. The principal outcome of interest was number of FRIDs, particularly the use of two or more FRIDs as multiple FRIDs has been associated with increased risk of falls (10).

Statistical Analysis

Univariate analysis was initially used to describe the overall population, including mean age, gender, prevalence of FRID subclasses, and principal diagnosis. The cohort was then dichotomized by age to assess the difference in the proportion of FRIDs between young and older age groups using the χ^2 statistic. Logistic regression models were then used to analyze predictors of being on two or more FRIDs. All statistical analyses were conducted with Stata version 13 (StataCorp LP, College Station, TX).

RESULTS

Patient Characteristics

A total of 292 patients presented to the department of Otolaryngology–Head and Neck Surgery for the chief complaint of dizziness. Patient characteristics are presented in Table 1.

The study population had a mean (SD) age of 53.3 (15.2) years, with a greater proportion of women (63 vs. 37%). With respect to FRIDs use, the overall prevalence of FRID use was 40.8%. Thirty-nine percent of the population was on a psychotropic medication, 37.3% on an antihypertensive, and 8.2% on a narcotic medication. About one-third of the population (33.9%) was on two or more FRIDs. The most common primary diagnosis was migraine (43.2%), followed by Ménière's disease (19.2%).

Multivariate Analysis of Factors Influencing FRID Use

The study population was then categorized into two age groups to further evaluate age differences in FRID use and diagnosis (Table 2). When individuals were divided into younger (age <50 yr) and older (age ≥ 50 yr) age groups, there was a greater prevalence of FRID use in older patients which was statistically significant in all cases except psychotropic medications. Of note, 40.2% of older individuals versus 23.9% of younger individuals were on two or more FRIDs ($p = 0.004$). There was a greater proportion of migraine among younger patients (55.8 vs. 35.2%, $p = 0.001$). There was no statistically significant difference in Ménière's disease or gender between the two groups.

Finally, we evaluated predictors of the use of multiple FRIDs (i.e., two or more) in multivariate analyses (Table 3). We found that age was the only significant predictor of being on two or more FRIDs with odds ratio 1.007 (96% CI 1.004–1.010). With every decade increase in age, being on multiple FRIDs was 7% more likely. Gender and diagnosis were not significantly associated with use of multiple FRIDs.

DISCUSSION

In this retrospective chart review, 292 patients presented to our specialty Neurotology clinic for outpatient management of their dizziness over a 6-month period. One-third of the overall population in this study was on two or more FRIDs. Furthermore, we found significant age differences in prevalence of FRID use in the study population. Increasing age was positively correlated with an increase in FRID use.

These results are consistent with prior reports from primary care ambulatory settings. Older individuals tend to be on more medications (5), likely reflecting the increase in disease burden that comes with age. An increase in the number of medications that one is prescribed has been found to correlate with an increase in the number of FRIDs (10), which suggests that there would indeed be a greater prevalence of FRID use among older individuals. In one study of FRID use in adults 50 years or older from the Irish Longitudinal Study on Ageing (11), the prevalence of psychotropic and antihypertensive medication use was 13.0 and 31.7%, respectively, in community-dwelling adults (compared to 41.9 and 48.6% for psychotropics and antihypertensives, respectively, in our age-matched group). The

prevalence of use was higher in our patient population compared to this general population, which could reflect differences in the U.S. versus Ireland-based cohorts, or could represent the increased rate of FRID use among individuals presenting with dizziness.

Given that in the current study one-third of the overall population were on multiple FRIDs, FRID use should be taken into account when attempting to evaluate and treat dizziness in the specialty Neurologic clinic setting. There has been some success in targeting FRID use in older patients with falls. In a prospective cohort study examining the risk of falls after withdrawal of FRIDs in a geriatric population (7), those who successfully discontinued FRID use were half as likely to have experienced a fall at follow-up. Even a reduction in the dose of FRIDs may have an effect in fall reduction. One case-control study found that with a sudden increase in the dose of benzodiazepine prescription, patients were over three times more likely to be hospitalized with a fall-related femur fracture (12), suggesting the association with falls and medication dosage. Similarly, one intervention aimed at reducing the dose of antipsychotics found the reduction in fall risk was related to medication dose (13). Similar success may be seen in a FRIDs reduction intervention to reduce dizziness in patients.

Reduction of FRIDs may be challenging, as these include a wide range of medications such as psychotropics (anxiolytics, neuroleptics, antidepressants), antihypertensives (beta blockers, vasodilators), and narcotic medications (7,8,10). These medications have their indications and discontinuing their use may come at a cost. Often patients have to make difficult tradeoffs between treating their medical conditions and reducing medication-related falls, with priorities varying across individuals (14). A multidisciplinary approach may be needed to undertake a FRIDs reduction intervention to individualize treatment strategies and safely reduce these drugs in a patient population.

This study does have limitations. Its retrospective design limits us to what has been previously documented in the medical record and only allows us to make associations and not determine causality between variables. Moreover, although studies have shown an increase in dizziness and imbalance associated with FRID use, and also a reduction in falls associated with reducing FRID use, we cannot determine with certainty in these study patients the extent to which their FRID use was contributing to their symptoms.

This study provides insight into medication use in older patients with dizziness presenting to an academic Neurology practice, who we have found to have a greater prevalence of FRID use compared to their younger cohort. FRID use should be considered when evaluating patients with dizziness. Possible future interventions in dizziness management should include attempts at decreasing the use of FRIDs.

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TABLE 1
Overall study population (n = 292)

Variable	n (%)
Mean age, yr	53.3 (SD 15.2)
Gender	
Male	108 (37.0%)
Female	184 (63.0%)
FRIDs	
Psychotropics	115 (39.4%)
Antihypertensives	109 (37.3%)
Narcotics	24 (8.2%)
Two or more	99 (33.9%)
Diagnosis	
Migraine	126 (43.2%)
Ménière's	56 (19.2%)
Other	110 (37.7%)

FRIDs, fall risk increasing drugs.

TABLE 2
Descriptive statistics of study population by age group

Variable	Group		Test Statistic (<i>P</i> Value)
	Age <50 (n = 113)	Age 50 (n = 179)	
	n (%)	n (%)	
Gender			
Male	40 (35.4%)	68 (38.0%)	$\chi^2_1 = 0.1995, p = 0.66$
Female	73 (64.6%)	111 (62.0%)	
FRIDs			
Psychotropics	40 (35.4%)	75 (41.9%)	$\chi^2_1 = 1.23, p = 0.268$
Antihypertensives	22 (19.5%)	87 (48.6%)	$\chi^2_1 = 25.13, p = 0.00$
Narcotics	4 (3.5%)	20 (11.2%)	$\chi^2_1 = 5.35, p = 0.021$
Two or more	27 (23.9%)	72 (40.2%)	$\chi^2_1 = 8.24, p = 0.004$
Diagnosis			
Migraine	63 (55.8%)	63 (35.2%)	$\chi^2_1 = 11.93, p = 0.001$
Ménière's	20 (17.7%)	36 (31.9%)	$\chi^2_1 = 0.260, p = 0.610$

FRIDs, fall risk increasing drugs.

TABLE 3
Regression model of being on two or more FRIDs (fall risk increasing drugs)

Variable	Adjusted Odds Ratio (95% CI)
Age	1.007 (1.004–1.010)
Gender	
Female	0.980 (0.875–1.097)
Male	
Diagnosis	
Migraine	0.963 (0.862–1.075)
Ménière's	1.045 (0.910–1.201)