

# Adverse Self-medication Practices Of Older Adults With Hypertension Attending Blood Pressure Clinics: Adverse Self-medication Practices

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## Abstract

Self-medication practices concerning over-the-counter (OTC) agents and alcohol were assessed in a convenience sample of 168 older adults attending 4 senior center blood pressure clinics. The subjects indicated their reasons for choosing specific OTC agents and problems they have obtaining information about the safety of OTCs in those treated for hypertension. Eighty six percent of the sample reported at least 2 or more self-medication practices that could result in an adverse drug interaction. The data can inform advanced practice nurses educating older adults with hypertension about potential drug interactions arising from self-medication.

## INTRODUCTION

Older adults living independently often self-medicate with OTC agents for common problems such as fever, mild pain, colds, allergies, indigestion and gas, constipation, and insomnia. Previous OTC medicine use studies indicate that about 50% of adults over 65 regularly use OTC pain relievers and vitamins, 23% regularly use antacids, and 10% regularly use cold remedies or antihistamines (1). Further, studies of alcohol use among the elderly indicate that approximately 65% self report use of alcohol on a regular basis (2,3,4).

Adams (5) found 38% of 311 residents of retirement communities who responded to a mail survey reported using both alcohol and a "high risk" medication likely to interact with alcohol. Recent changes from prescription to OTC status for certain pain relievers, antihistamines, and acid reducers (H-2 blockers) makes consumer understanding of potential problems arising from self medication more important, as these agents have potential adverse interactions with prescription medications and alcohol (6,7,8).

A cross-sectional personal interview survey of high-functioning elderly individuals found they had significantly less understanding of the function and interactions of their OTC medications compared to their prescription medications (9). Pollow et al. (10) found that 65% of a sample of 667

people over 65 who were managing their own health reported at least one Rx drug-OTC drug or drug-alcohol combination with a possible adverse reaction. Of the potential interactions identified, 84% involved OTC analgesics.

The purpose of this study was to assess the self-medication practices of older adults with hypertension attending blood pressure clinics. Results of this study may guide advanced practice nurses in their education efforts aimed at older adults with hypertension.

## METHODOLOGY

The self-medication survey centered on OTC agents that can potentially interact with antihypertensives. A focus group of older adults was used to guide the choice of phrasing. For example, the term "high blood pressure" was used rather than "hypertension," "medicine" rather than "drug," "pain reliever" rather than "analgesic." The instrument was written at the 5th grade reading level and printed in large (14 point) Arial font. The self-medication survey had a series of response options to check off so that response burden was at a minimum. The method used to establish concurrent validity of the self-report is described elsewhere (11).

Subjects were asked to consider their medicine use for the past month when answering the survey. The survey contained demographic questions followed by questions

asking where they buy OTC agents, how they find out if an OTC product is safe for them to use, and problems they have in obtaining information about OTC products. They were asked to check off current health conditions and rate their current health status. They were asked to write in what they took for high blood pressure and indicate how often they take it. Subjects were asked to write in the name of the agent they took most often in the last month for each common health problem that could be treated with OTC agents. They were asked to check off how often they took that agent and the reasons for selecting the agent (for example “cheapest, least expensive,” “works fastest,” “works best,” “works longer,” “safer for blood pressure,” “safer for stomach,” “recommended by doctor or nurse,” “recommended by pharmacist,” “recommended by relative or friend.”) Space was provided for subjects to list other reasons for taking the agent.

The survey also contained a series of questions about specific self-medication practices. For example, subjects were asked to check off medicines they took before going to a party and medicines they took to protect the stomach when taking a pain reliever. They were asked if they drank wine, beer, or hard liquor and when they drank alcohol with respect to taking medicines.

One of the limitations of health surveys is “social desirability” that is, subjects may indicate what they think is the “correct” choice or what they think the investigator wants to hear. Social desirability poses a particular problem for researchers surveying alcohol use. Brown and colleagues (12), found that positive responses to both of the questions “Have you ever drank more than you meant to” and “Have you felt you wanted to or needed to cut down on your drinking” discriminated those with current substance abuse disorders with 81% sensitivity and specificity. Thus the two-item conjoint screening question (TICS) was used to screen subjects for heavy alcohol use.

## **ADMINISTRATION OF INSTRUMENTS TO OLDER ADULTS WITH HYPERTENSION**

A convenience sample of 167 older adults attending blood pressure clinics at 4 local blood pressure clinics was recruited to complete the self-medication survey. Subjects met independence and cognitive functioning criteria developed and validated by the MacArthur Research Program in Successful Aging (9). They lived independently and were able to perform activities of daily living on the Katz (13) tool and 7 of 8 combined Nagi and Breslau

functional items (14, 15). They were able to answer 6 of 10 items on the Short Portable Mental Status Questionnaire (16) and have a reading comprehension of at least grade 6 on the Rapid Estimate of Adult Literacy (17). They had a visual acuity of at least 20/100 with corrective lenses as needed.

Subjects signed an informed consent form stating that all data were either anonymous (instruments) or confidential (assessment of inclusion criteria). Interviewers were senior community health nursing students trained by a doctoral student who is a certified geriatric nurse specialist. The student nurse interviewers sat beside each subject as the survey was completed and ensured that each section was understood and completed. Classification of medications was accomplished by a doctorally prepared pharmacologist using a database derived from the Physician’s Desk Reference (18) and Physician’s Desk Reference for Nonprescription Drugs (19) previously developed by the first author (20).

## **ANALYSES**

The BMDP statistical package was used for data analysis (21). Both univariate and multivariate data screening techniques were used and data were discarded if indicated as invalid multivariate outliers. Missing data at the item level were imputed with regressed scores from available variables. In instances of 30% or more missing data, case-wise deletion occurred.

## **RESULTS**

Two subjects were omitted from the sample because they did not indicate they had hypertension or were taking antihypertensive medication. The mean age of the remaining 165 subjects was  $74.3 \pm 5.5$  years, the range was 60-95 years. The mean education level was  $10.98 \pm 2.1$  years. The majority of the subjects were Caucasian (97.5%), lived in a house or apartment and either lived alone or with a spouse. The mean self-rating of health was  $3.74 \pm .07$  on a 5-point scale. (see Table 1).

**Figure 1**

Education	Percentage
8-11 years	58.2
12	27.9
13-16	24.8
≥ 17	21.8
Domicile	Percentage
House	66.4
Senior Housing	15.2
Apartment	10.9
Mobile Home	4.2
Condominium	3.0
Other	1.2
Habitation Partners	Percentage
Live alone	47.3
With spouse	44.8
With child	3.0
With other relative	4.2
With housemate	0.6
Perceived Health	Percentage
Very Poor	0.0
Poor	11.5
Average	22.4
Good	43.6
Very Good	21.8

<sup>1</sup>N=165

Table 2 lists where the subjects reported buying OTC agents, where the subjects got information on OTCs, and problems subjects had getting information on OTCs. The 3 most frequent OTC purchase points were a pharmacy store with a pharmacist (74.3%), grocery store (19.2%) and discount store (13.8%). The 3 most frequently consulted sources of information (Table 3) about OTCs were the label (54.5%), physician (50.3%), and pharmacist (48.5%).

**Figure 2**

Points of Purchase	Percentage <sup>2</sup>
Pharmacy with RPh	74.3
Grocery	19.2
Discount store	13.8
Pharmacy without RPh <sup>1</sup>	10.2
Mail Order	5.4
Health Food Store	4.8
Naval Clinic	1.8
Convenience Store	0.6

<sup>1</sup> At the time of the survey, the local CVS pharmacy did not have a pharmacist due to a non-complete clause in the property agreement with the owner, an independent pharmacist with an adjoining store.  
<sup>2</sup>N=165

**Figure 3**

Sources of OTC Information	Percentage <sup>2</sup>
Read OTC label	54.5
Ask physician	50.3
Ask pharmacist	48.5
Books	10.8
Never ask	7.8
Ask nurse	6.0
Call 800 number	6.6
Magazine articles	5.4
Pharmacy printout	4.8
TV ads	3.6

<sup>1</sup>Sources checked by fewer than 3 subjects (less than 1.8% of sample) included "Ask friend," and "Magazine ads."  
<sup>2</sup>N=165

The 3 most frequent problems the subjects had obtaining OTC information (Table 4) were the print on the label is too small (38.3%), the label information is unclear (15.0%), and there is not enough information on the label (9.0%). Nearly half of the sample (45.5%) indicated that they have no problems obtaining information about OTCs.

**Figure 4**

Problems Obtaining OTC Information <sup>1</sup>	Percentage <sup>2</sup>
None	45.5
Label print too small	38.3
Label information unclear	15.0
No information on medicine	9.0
I don't have time to read information	5.4
Doctor is too rushed	7.2
Doctors don't know about OTCs	4.8
Pharmacists are too busy	3.0
Nurses don't know about OTCs	1.8
Not enough information about interactions	1.8

<sup>1</sup>Problems checked by fewer than 3 subjects (less than 1.8% of sample) included "Pharmacists don't know about OTCs," "Line too long," and "I don't know what to ask."  
<sup>2</sup>N=165

Aspirin, ibuprofen and other non-steroidal anti-inflammatory drug (NSAID) use

Chronic NSAID use (other than daily low-dose aspirin) increases blood pressure in both normotensive and untreated hypertensive individuals. Additionally, NSAID use has been found to counteract the antihypertensive effects of thiazide diuretics, beta-blockers, alpha-blockers, and angiotensin converting enzyme inhibitors (ACEIs) (22 23 24 25 26). Many older adults self-medicate their osteoarthritis pain with OTC NSAIDs even though inflammation is not characteristic and acetaminophen is recognized as the drug of choice in treating osteoarthritis (27 28). Individuals with hypertension should be encouraged to use acetaminophen for pain and fever.

Ninety-nine of the subjects (59.3%) reported taking something for pain over the month preceding the survey. Of

these, 49 (49.5%) reported taking an OTC NSAID pain reliever (e.g. aspirin<sup>1</sup>, ibuprofen, Motrin, Advil, Excedrin, etc.) and 39 subjects (39.4%) reported taking acetaminophen (e.g. generics or Tylenol) most often for pain. Of the subjects reporting NSAID use, 46.9% reported taking an NSAID for pain for 3 or more days at a time; 36.7% of those taking an NSAID for pain reported taking it daily.

When subjects were asked why they took that specific pain reliever, 48.9% of the NSAID users and 64.1% of the acetaminophen users indicated that their doctor or nurse recommended the agent. Other reasons for use indicated by the NSAID users were “works best” (48.9%), “am not allergic to it” (14.2%) and “recommended by relative or friend” (8.2%). Among the acetaminophen users, other reasons for use were “works best” (23.1%), “safer for stomach” (15.4%) and “not allergic to it” (12.8%). Interestingly, only 3 subjects (7.8%) of those taking acetaminophen indicated “safer for blood pressure” as a reason for taking an acetaminophen containing pain reliever.

Another consideration with OTC pain reliever use by older adults is the effect of chronic use on renal function. Taken together, 28.8% of the subjects using a pain reliever over the preceding month took it daily. Chronic use of either NSAIDs or acetaminophen can impair renal function in older adults.

NSAIDs block intrarenal cyclooxygenase and suppress prostaglandin synthesis. Renal prostaglandins play a minor role in normal renal homeostasis. However, in individuals with decreased glomerular flow and pressure (e.g. heart failure, age-related renal impairment, and diuretic induced volume depletion) prostaglandins are crucial in maintaining renal function. NSAID use in such individuals may result in acute renal failure<sup>(29, 30)</sup>. While relatively rare, nephrotoxicity can occur from acetaminophen (including doses below those that cause hepatotoxicity)<sup>(31)</sup>. Patients with renal impairment should take acetaminophen on a chronic basis only with careful monitoring by a health care provider.

Acetaminophen remains the drug of choice for fever and pain in individuals on antihypertensive therapy. However, if they also take warfarin, they should also be counseled to limit their intake to 6 or fewer regular strength tablets per week unless INR is carefully monitored. At higher doses, acetaminophen inhibits liver metabolism of warfarin resulting in an increase in INR and potential intracranial bleeding<sup>(32)</sup>. There were 7 subjects taking acetaminophen

who also reported taking warfarin. Of these, 4 subjects (57.2%) reported taking an acetaminophen preparation daily for the past month. Two subjects wrote in that they had taken prescription Percocet (contains acetaminophen) three times a day for the previous month.

## **ANTICOAGULANT USE WITH VITAMIN E**

Vitamin E use must also be considered in those taking anticoagulants. At doses higher than 400 IU per day, vitamin E has been shown to inhibit vitamin K synthesis and mimic warfarin activity. Lower doses of vitamin E (around 100 IU) have been shown to inhibit platelet aggregation in a manner similar to that of low dose aspirin<sup>(33)</sup>.

Among the 16 subjects who reported using warfarin, 6 (37.5%) reported taking vitamin E. One subject reported taking 100 IU of vitamin E and the remaining 5 subjects did not know the dose they were taking. Among the 92 subjects who reported taking low dose aspirin daily as a “blood thinner,” 50 (54.3%) reported taking vitamin E. Of these, 35 (70%) reported taking 400 IU or more, 2 subjects each reported taking 100 IU and 200 IU and 11 subjects did not know the dose they took. The dose-response effects of Vitamin E on INR and platelet aggregation in individuals taking warfarin and, or low-dose aspirin needs further study. Clinicians should question clients taking anticoagulants about their vitamin E intake and ask them to bring their vitamin and mineral supplements to their appointments for verification.

## **DECONGESTANT USE**

Oral decongestants have well-known pressor effects and are generally contraindicated in individuals with hypertension. Among the 57 subjects reporting using an OTC medicine for colds in the past month, 17 (29.8%) reported using an agent that contains an oral decongestant. The most common reason indicated for using this product was “works best” (52.9%) and “recommended by doctor or nurse” (35.3%)

## **ANTACID AND CALCIUM SUPPLEMENT USE WITH OTHER MEDICINES**

Enteric coatings dissolve in an alkaline pH. Taking calcium supplements or antacids with enteric-coated medications such as coated aspirin, erythromycin, or bisacodyl (as in Dulcolax) can result in gastric irritation. Calcium supplements and antacids can also reduce the absorption of medications such as levothyroxine, digoxin, phenytoin and ciprofloxacin, and nutrients such as iron, zinc, vitamin B12, and thiamin. Older adults should be counseled to take

calcium supplements and antacids at least 2 hours apart from other medicines and nutrients (34 35).

Of the 165 subjects in this study, 82 used a calcium supplement. The majority (67.4%) reported taking it at the same time (N = 44) or within an hour (N = 13) of their other medicines. Among the 14 subjects reporting taking levothyroxine, 11 (78.6%) reported taking a calcium supplement and of these, 7 (63.6%) reported taking their calcium at the same time or within an hour of their other medications. As Synthroid is the second most commonly prescribed brand-name medication in the US and calcium supplements the most common nutrition supplement (36), taking both at the same time may be a widespread adverse practice that needs further study.

Of the 60 subjects reporting taking low dose aspirin daily, 35 (58.3%) reported taking a calcium supplement at the same time, thus dissolving the enteric coating on the aspirin.

### **ALCOHOL USE WITH MEDICINES**

Alcohol has a pressor effect when more than 1 oz of alcohol is consumed per day (e.g. one “standard drink” or the amount in 2 oz 100 proof whiskey, 8 oz of wine, 24 oz of beer). Individuals with hypertension should be counseled to limit their alcohol intake to one standard drink per day (37 38). Older adults should be queried about their alcohol use when blood pressure readings are elevated.

Of the 165 subjects in the study, 65 (39.4%) reported having alcohol over the past month. A limitation of the survey was that it did not query how much or how often alcohol was consumed. None of the subjects checked the screening items for heavy alcohol use (12) “Drank alcohol more than I meant to” or “Wanted to cut down on drinking alcohol.” Subjects were, however, asked when they drank alcohol with respect to the timing of their other medications. Of the 65 subjects who reported drinking alcohol over the past month, 21 (32.3%) reported drinking alcohol at the same time (N=6) or within an hour (N=15) of taking other medicines.

Alcohol consumption within an hour of consuming aspirin and aspirin-like agents (e.g. NSAIDs) increases the risk of GI bleeding. Of the 21 subjects reporting drinking alcohol at the same time or within an hour of other medications, 9 (42.9%) use an NSAID daily for pain and 11 (52.3%) use low dose aspirin daily as an anticoagulant.

Attempts to counteract the ulcerogenic effect of NSAIDs by premedicating with antacids or OTC acid reducers (H2

antagonists) actually increases the older adult’s risk of hospitalization for serious GI bleeds (39). Antacids and acid reducers do not prevent NSAID-induced gastric ulcers. In a study by Sievert, Stern, Lambert & Peacock (40), subjects receiving a magnesium-aluminum antacid (Maalox) to prevent NSAID injury from naproxen had a significantly greater number of gastric erosions than did those with placebo plus naproxen. Limiting NSAID use is the only practice that can decrease the risk of NSAID induced gastric damage (41).

Gastric ulceration may be insidious in people using analgesics until a major bleeding episode occurs. NSAIDs can directly damage the mucosal barrier, but the major mechanism is a systemic inhibition of prostaglandins that control gastric mucus and bicarbonate production. All NSAIDs can cause gastric bleeding.

Of the 49 subjects who reported using an NSAID for pain, 8 (16.3%) reported using an antacid or acid reducer at the same to “protect the stomach when taking a pain reliever.” However, none of the 18 subjects who reported using an NSAID daily for pain reported this practice.

Aspirin (but, interestingly, not other NSAIDs) and H2 antagonists (i.e. “acid reducers” the term now mandated for use on OTC labels) increase the bioavailability of alcohol by inhibiting gastric alcohol dehydrogenase (GAD) and increasing gastric emptying. People who take aspirin (including low dose or “baby” aspirin) or H2 antagonists within 2 hours of drinking alcohol will have higher blood alcohol levels and increase their risk of alcohol associated injuries (42 43 44 45). This interaction may be greater in men as they have higher GAD levels than women. People who drink alcohol should not premedicate with H2 antagonists or medicine containing aspirin (such as Pepto-bismol).

Of the 21 subjects who reported taking alcohol at the same time or within an hour of other medicines, 7 (33%) reported using an acid reducer (e.g. H2 blocker) daily and 11 (52.3%) reported using low dose aspirin daily.

Normally, a compound called glutathione detoxifies acetaminophen metabolites. Chronic alcohol ingestion induces hepatic enzymes and leads to an increased production of toxic acetaminophen metabolites. Glutathione becomes depleted and irreversible hepatotoxicity results (46 47). Acetaminophen now carries an FDA mandated warning against using acetaminophen if one takes 3 or more alcoholic

drinks per day.

Of the 11 subjects who reported drinking alcohol within the past month, 2 (18.2%) reported taking acetaminophen for pain on a daily basis. Again, since the amount of alcohol use was not assessed, it is unclear if these subjects were at risk for an alcohol induced acetaminophen hepatotoxicity.

### **IMPLICATIONS FOR PRACTICE**

Eighty six percent of the 165 subjects in this convenience sample of older adults with hypertension attending local blood pressure clinics reported at least two self-medication practices that could result in an adverse drug interaction.

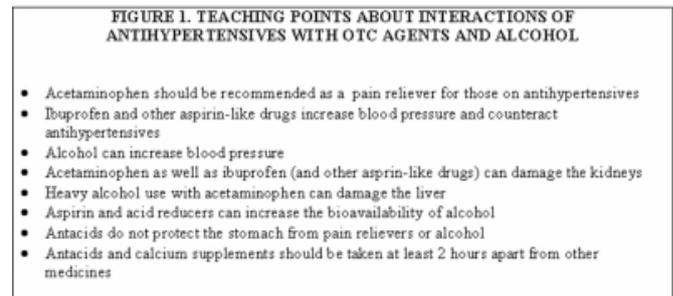
The reasons for the adverse self-medication practices found in this survey are unclear. While OTC label warnings exist, many subjects reported encountering problems reading or understanding OTC labels. On the other hand, nearly half of the sample indicated that they have no problems obtaining information about OTCs. The preponderance of subjects indicating that they took NSAIDs because the agent was recommended by their doctor or nurse is disturbing. Whether the clinician did, in fact, make the recommendation or whether the subject misunderstood the clinician or was confused at the point of OTC purchase is not known. Future studies should be directed to clinician-client communication with regard to OTC recommendations made for clients on antihypertensive therapy.

Some self-medication practices, such as taking calcium supplements or alcohol at least 2 hours apart from medicines or choosing acetaminophen rather than NSAIDs for pain or fever, may appear to be relatively easy for older adults on antihypertensive therapy to adopt. However, most older adults take multiple prescription and non-prescription medications. Perhaps subjects take medications together in order to remember to take them. What may appear to be lack of client adherence may actually be a strategy the client uses to attempt to “do the right thing,” that is; to the client it is a normative, health-promoting behavior.

Even though the results from this study are not generalizable, the data may provide direction for future research to study self-medication practices of other aggregates such as ethnic minorities, urban residents, and people with low literacy levels. It may also guide studies of clinician-client communication and inform developers of focused efforts to educate older adults with hypertension to better manage their medications and avoid interactions

arising from self-medication. Nurses providing care at blood pressure clinics have an ideal opportunity to clarify misunderstandings (Figure 1) about OTC medications, nutrition supplements, and alcohol held by their clients with hypertension.

**Figure 5**



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