BRIEF REPORTS

Use of and Communication about Dietary Supplements Among Hospitalized Patients

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BACKGROUND: Use of dietary supplements (DS) is common in the United States; however little is known about the use of DS specifically in hospitalized patients.

OBJECTIVE: The goal of this study is to begin to characterize trends in DS use by hospitalized patients and to assess the degree of patient–physician communication about use of DS that occurs during hospitalization.

DESIGN: This is a cross-sectional, observational pilot study.

PARTICIPANTS: Participants were admitted to the general internal medicine or geriatrics service by house staff residents; those ≥ 18 years of age who were medically stable, cognitively intact and fluent in English and/or Spanish were invited to participate in the study.

RESULTS: Nearly 80% of hospitalized patients reported use of DS, with 52% reporting use of non-vitamin/non-mineral DS. During the admission process, physicians documented inquiring about DS use only 20% of the time. While the majority of patients had no concern about temporarily discontinuing their DS during hospitalization, 13% of patients reported that they believed there was nothing wrong with continued use of DS while hospitalized regardless of the recommendations provided by their inpatient physicians.

CONCLUSIONS: Use of DS in hospitalized patients is common, and communication between patients and physicians regarding their use is limited.

KEY WORDS: dietary supplements; patient–physician communication; complementary and alternative medicine.
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BACKGROUND

Use of dietary supplements (DS) in the United States is widespread with nearly 20% of Americans reporting use of DS within the past 12 months [1,2]. Unfortunately, growth in use of DS has not been paralleled by increased communication between patients and physicians addressing this topic [3]. The literature documenting trends in the utilization of DS and disclosure of use to physicians has been predominantly in the outpatient setting [4–6]. Although the use of DS is more common among patients who have been hospitalized within the past 12 months, specifics about use of DS in these patients are lacking [1]. The purpose of this pilot study was to characterize DS use by hospitalized patients, evaluate patient–physician communication about use of DS during the hospital admission process, and document patients' attitudes and expectations about DS use while hospitalized.

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METHODS

Subjects. Eligible patients admitted by internal medicine house staff residents to the medicine and geriatric services at the University of North Carolina (UNC) Medical Center were invited to participate in the survey. Eligibility criteria included: age ≥18 years, medically stable (i.e., not in an ICU or being evaluated for ICU admission), cognitively intact, and conversant in English or Spanish. Patients in isolation were excluded. Approval for the study was granted by the UNC IRB.

Data Collection. Within 72 hours of admission, nurses identified eligible patients and obtained permission for research staff to approach these patients. After providing informed consent, patients were asked a series of questions about their use of DS. Patients identified DS taken within the past year, frequency of use, and perceived indications. A DS was recorded if the patient reported taking it for health related reasons even if the product could be considered a food (i.e., green tea, acidophilus enriched yogurt). Additional questions assessed: the communication patterns about DS use between the patient and the admitting resident physician; patients' attitudes regarding use of DS in the hospital; and patients' intentions for discussing DS use with a physician at discharge. Patients also gave their permission for chart abstractions.

Data Analysis. Descriptive statistics were employed to examine the data. Data analysis was conducted using SPSS version 15.0. Patients' responses to open-ended questions were reviewed and categorized independently by the members of the research team. Proposed response categories were

compared and consensus was reached on categories of related responses.

RESULTS

Demographic Information. Of 177 patients admitted over a six week period, 23% were unavailable for eligibility assessment, 29% did not meet eligibility criteria and 14% refused participation. Sixty patients were evaluated for DS use. Table 1 highlights demographic characteristics.

DS Use. At admission, 78.3% (n=47) of patients reported use of DS and 52% used non-vitamin/non-mineral (NV/NM) DS (n=31). Excluding DS also used as foods (green tea, acidophilus yogurt, protein powder), 48.9% reported using NV/NMDS. The use of a wide variety of DS was reported as indicated in Table 2.

Mean number of DS used was 2.6±2.4 (range 0–11). Reported DS use did not vary significantly by gender (women 71.4%; men 84.6%). Caucasians were more likely to report use of DS (93.1%) than non-Caucasians (African-Americans 69.6%; Hispanics 50%).

Patient–physician Communication. Seventy-five percent (n=45) of patients reported that no physician inquired about DS use at the time of admission and 5% (n=3) were unsure. Retrospective review of admission documents revealed that 80% of patients' charts had no documentation to support that the admitting physician had inquired about DS use.

Of those using DS, 74% did not inform the admitting physician about their use of DS. Rationales for not doing so included: 1) patient felt that it was not important to report DS use (55.9%); 2) admitting physician did not ask (20.6%); 3) patient thought that the DS use was already recorded in the chart and therefore assumed the admitting physician was aware of DS use (17.6%); and 4) patient felt that the admitting physician did not care about DS use (5.9%). Nine percent of patients reported telling the admitting physician about their DS despite not specifically being asked.

Table 1. Demographic Information (n=60) *

Gender	
Female	57%
Race	
Caucasian	48%
African American	37%
Hispanic	13%
Asian	2%
Age, years	53±17
Reason for admission	
Gastrointestinal distress	39.7%
Uncontrolled hypertension	7.9%
Renal failure	7.9%
Pre-syncope/Syncope	4.8%
Chest pain	4.8%
Shortness of breath	4.8%
Other	19%
Not specified	11.1%

Data are expressed as percentage or mean ± SD

Table 2. Types of Dietary Supplements Used by Hospitalized Patients*

Vitamin and mineral supplements	
Multivitamin	25 (53)
Calcium	11 (23)
Ferrous sulfate	9 (19)
Folic acid	7 (15)
Vitamin C	7 (15)
Vitamin D	6 (13)
Magnesium	5 (11)
Vitamin B12	4 (9)
Vitamin E	3 (6)
B Complex vitamin	2 (4)
Zinc	2 (4)
Beta carotene	1 (2)
Chromium picolinate	1 (2)
Selenium	1 (2)
Vitamin B1	1 (2)
Vitamin B6	1 (2)
Vitamin K	1 (2)
Non-Vitamin or mineral supplements	
Green tea	11 (23)
Garlic	6 (13)
Echinacea	4 (9)
Fish oil	4 (9)
Glucosamine	4 (9)
Acidophilus	3 (6)
Chondroitin sulfate	3 (6)
Co-enzyme Q10	2 (4)
Ginseng	2 (4)
Cranberry	1 (2)
Flax seed preparations	1 (2)
Ginger	1 (2)
Ginkgo biloba	1 (2)
Grapeseed extract	1 (2)
Lycopene	1 (2)
Protein shake	1 (2)
Soy preparation	1 (2)

Data are expressed as number (%) of patients reporting use

Attitudes about Continued Use of DS while Hospitalized. Of those using DS, 86% stated that they would not be concerned about stopping their DS temporarily while hospitalized, if requested by their physician, with 55% stating that they would absolutely follow their physicians' recommendations regarding DS use while hospitalized. However, 13% stated they did not think it was dangerous to continue their DS while hospitalized despite medical advice.

Finally, when asked about their plans for discussing DS use with the discharging physician, 45% of patients taking DS did not plan on discussing their DS use, 10% said they probably would discuss DS use, 26% said they would definitely discuss their DS, use and 19% said they would wait and discuss their DS use with their primary care provider after discharge.

DISCUSSION

To our knowledge this is the first published report documenting DS use in US hospitalized patients. We demonstrate that DS use is common in hospitalized patients with nearly 80% of

patients reporting use of DS and over half reporting NV/NMDS use. Recently, greater focus has been on the use of NV/NMDS, given concern about potential adverse interactions with prescription medications. NV/NMDS use in the United States ranges from 19%–45% and varies based upon gender, age, geographic location, education level and health status [7,8]. Fifty two percent of hospitalized patients in our sample reported use of NV/NMDS, which is surprising given the high proportion of African-Americans and Southern geographic location, two factors that have traditionally been related to lower rates of NV/NMDS use[6]. One possible explanation is sampling bias, since 14% of the eligible patients refused to participate in the survey for unknown reasons. Presumably some refused because they were not using DS, which could partially explain our higher reported rates of DS use.

Consistent with outpatient studies of DS use, we found that most patients do not inform healthcare providers about their DS use. The main reason for non-disclosure was that patients believed their DS use was unimportant to the healthcare team. Importantly, we discovered that the majority of patients were never asked by the admitting resident physician about DS use. This is similar to findings from Israel where only 6% of patients were specifically asked about DS use during the admission process[9]. Their lack of inquiry about DS use suggests that resident physicians may not be adequately trained to recognize the serious potential for adverse dietary supplement-drug interactions. During a hospitalization, patients are a captive audience, and this is an opportune time for education[10]. Misconceptions about DS are common and most patients are interested in additional information about DS use, therefore we view a hospitalization as a valuable educational opportunity for discussion about DS use. Following an admission to the hospital, often new medications are included on the patient's discharge medication list. We show that very few patients definitely intended to discuss their DS use with the heath care team prior to discharge. If the physician is unaware of patients' plans for resumption of DS upon discharge, the potential exists for DS-drug interaction that could contribute to additional morbidity and possibly mortality.

The majority of patients were not concerned about temporary discontinuation of their DS while hospitalized; however a small, but significant percentage of patients (13%) saw no harm in continuing to use their DS while in the hospital despite medical advice. As reliance upon DS for perceived health enhancement continues to escalate in the US, hospital staff and administration are confronted with challenges related to DS use in hospitalized patients. The Joint Commission of Health Care Organizations (JCHCO) has mandated that health-care providers become more aware of patients' use of DS in the hospital[11]. Under JCHCO directives, the use of DS in the hospital must be governed by policies that regulate non-prescription medications brought from home and medical staff approval is required prior to allowing a patient to use any DS brought from home. As outlined by Boyer, hospitals vary widely in their practices regarding the use of DS in the hospital[12]. Universally banning the use of any DS while hospitalized has the potential for patient dissatisfaction and perpetuates the habit of poor communication between medical staff and DS use. Our findings suggest that despite this type of policy, a considerable proportion of patients may bring DS into the hospital and use them while hospitalized without informing hospital staff. Conversely, allowing patients to freely use any DS without restriction while hospitalized is also risky and violates regulatory agency recommendations. It is crucial that hospital staff, including physicians, nurses, pharmacists and administration, develop increased educational programming, awareness and communication about the use of DS in hospitalized patients to ensure patient safety and satisfaction.

Limitations include small sample size and the potential for recall bias. Additionally, generalizability is limited given our single, tertiary referral center location and by the fact that only patients admitted by internal medicine residents to the general medicine and geriatric services were included in the our analyses. Typically the general medicine and geriatric services at UNC admit patients with a variety of medical problems; however, we acknowledge that a large proportion of the patients surveyed had gastrointestinal (GI) complaints. At the time this pilot study was conducted, there was no specific GI specialty service at UNC, which potentially explains this sampling bias.

Our findings suggest that: 1) use of DS in hospitalized patients is common, 2) communication about DS use between admitting resident physicians and patients is limited, and 3) although most patients were not concerned about discontinuing their DS while hospitalized, 13% of patients reported they saw no harm in continuing their DS despite medical advice to discontinue the DS during hospitalization. Further research is needed to explore the generalizability of our findings, as well as to explore strategies for improving physician-patient communication about DS use in-hospital, and for improving hospital staff education about DS indications and contraindications.

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Conflict of Interest: *None disclosed.*

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REFERENCES

1. **Barnes PM, Powell-Griner E, McFann K, Nahin RL.** Complementary and alternative medicine use among adults: United States, 2002. Adv Data. 2004;343:1–19.
2. **Eisenberg DM, Davis RB, Ettner SL, Appel S, Wilkey S, Van Rompay M, Kessler RC.** Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. Jama. 1998;280 (18):1569–75.
3. **Robinson A, McGrail MR.** Disclosure of CAM use to medical practitioners: a review of qualitative and quantitative studies. Complement Ther Med. 2004;12(2–3):90–8.
4. **Adler SR, Fosket JR.** Disclosing complementary and alternative medicine use in the medical encounter: a qualitative study in women with breast cancer. J Fam Pract. 1999;48(6):453–8.

5. **Jazieh AR, Kopp M, Foraida M, Ghouse M, Khalil M, Savidge M, Sethuraman G.** The use of dietary supplements by veterans with cancer. J Altern Complement Med. 2004;10(3):560–4.
6. **Gardiner P, Graham RE, Legedza AT, Eisenberg DM, Phillips RS.** Factors associated with dietary supplement use among prescription medication users. Arch Intern Med. 2006;166(18):1968–74.
7. **Wold RS, Lopez ST, Yau CL, Butler LM, Pareo-Tubbeh SL, Waters DL, Garry PJ, Baumgartner RN.** Increasing trends in elderly persons' use of nonvitamin, nonmineral dietary supplements and concurrent use of medications. J Am Diet Assoc. 2005;105(1):54–63.
8. **Kelly JP, Kaufman DW, Kelley K, Rosenberg L, Anderson TE, Mitchell AA.** Recent trends in use of herbal and other natural products. Arch Intern Med. 2005;165(3):281–6.
9. **Goldstein LH, Elias M, Ron-Avraham G, Biniaurishvili BZ, Madjar M, Kamargash I, Braunstein R, Berkovitch M, Golik A.** Consumption of herbal remedies and dietary supplements amongst patients hospitalized in medical wards. Br J Clin Pharmacol. 2007;64(3):373–80.
10. **Roman SH, Chassin MR.** Windows of opportunity to improve diabetes care when patients with diabetes are hospitalized for other conditions. Diabetes Care. 2001;24(8):1371–6.
11. Comprehensive accreditation manual for hospitals. Medication management standards. Oakbrook Terrace, IL: Joint Commission on Accreditation of Healthcare Organizations, 2004.
12. **Boyer E.** Issues in the management of dietary supplement use among hospitalized patients. J Med Toxicol. 2005;1(1):30–4.