Usage patterns, health, and nutritional status of long-term multiple dietary supplement users: a cross-sectional study

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ABSTRACT

Dietary supplement use in the United States is prevalent and represents an important source of nutrition. However, little is known about individuals who routinely consume multiple dietary supplements. This study describes the dietary supplement usage patterns, health, and nutritional status of long-term multiple dietary supplement users, and where possible makes comparisons to non-users and multivitamin/ mineral supplement users.

INTRODUCTION

Diet and nutrition play important roles in the maintenance of health and prevention of disease. Dietary supplements represent an important source of essential nutrients since they are widely used and often contain 100% or more of the Daily Value of one or more nutrients. They are also of concern because of potential adverse effects. Prior studies have reported the prevalence of dietary supplement usage and the characteristics of users in the United States (US) population. In the most recent reporting of nationwide survey data, the National Health and Nutrition Examination Survey (NHANES) 1999–2000, 52% of adults reported taking a dietary supplement in the past 30 days. This and other surveys have generally found that dietary supplement usage is more common in women than men, in older participants than in younger ones, in Whites compared with Blacks and Mexican Americans, in the more educated as compared to the less educated, and in the more affluent as compared to less affluent. In NHANES 1999–2000, approximately 47% of dietary supplement users reported taking only one type of supplement (most commonly a multivitamin/mineral). Only 3 individuals out of over 11,000 surveyed reported taking 20 or more different supplements in the past 30 days. Consequently, little if any descriptive information has been reported about individuals who typically consume multiple dietary supplements. This cross-sectional study was undertaken to describe the dietary supplement usage patterns, serum nutrient and biomarker concentrations, and health status of a convenience sample of individuals who were daily users of multiple dietary supplements (median of 26 different dietary supplements taken daily in the prior 12 months). In addition, biomarker concentrations and the health status of multiple dietary supplement users were compared with two other convenience samples assembled from NHANES: non-users of supplements and those who consumed a multivitamin/mineral supplement only.

METHODS

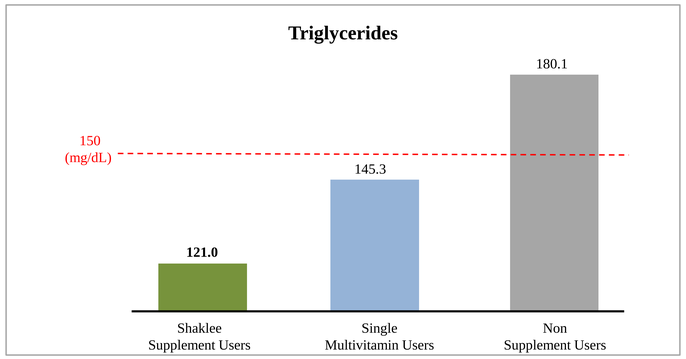
Using a cross-sectional study design, information was obtained by online questionnaires and physical examination (fasting blood, blood pressure, body weight) from a convenience sample of long-term users of multiple dietary supplements manufactured by Shaklee Corporation (Multiple Supp users, n = 278). Data for non-users (No Supp users, n = 602) and multivitamin/mineral supplement users (Single Supp users, n = 176) were obtained from the National Health and Nutrition Examination Survey (NHANES) 2001–2002 and NHANES III 1988–1994. Logistic regression methods were used to estimate odds ratios with 95% confidence intervals.

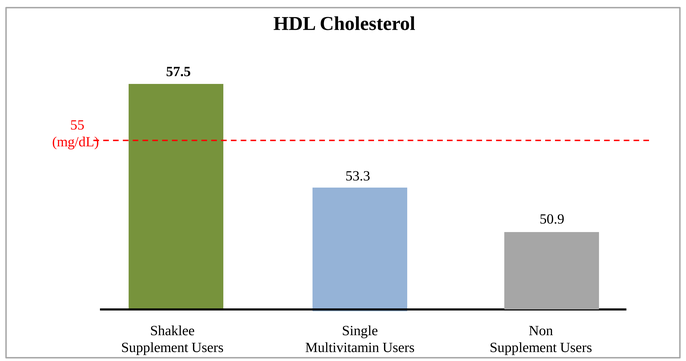
RESULTS

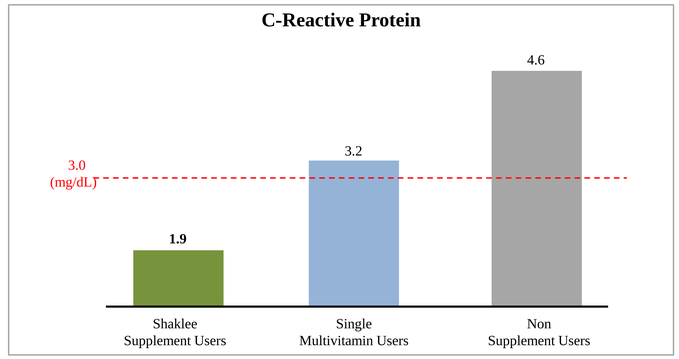
Table 1. Demographic information of the three supplement user groups

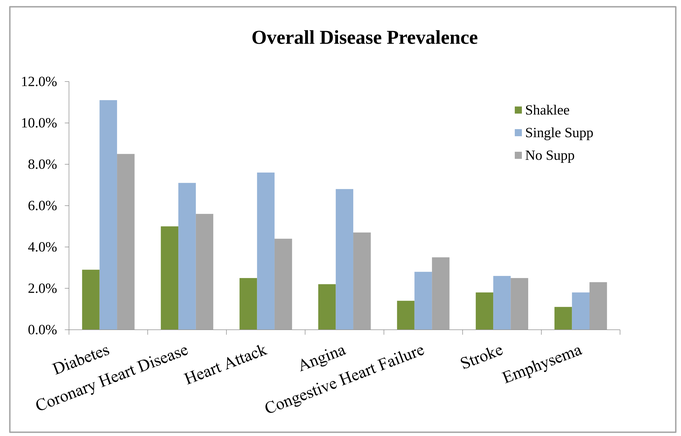
Characteristic	No Supp.	Single Supp.	Shaklee	P-value*
Number of subjects	602	176	278	
Sex (% female)	40.5	44.6	57.9	<0.0001
Race (% white)	100	100	98.9	
Age, years (mean, SE)	53.7 (0.59)	57.0 (0.99)	63.3 (0.48)	<0.001
BMI, kg/m^2 (mean, SE)	29.4 (0.32)	27.9 (0.46)	25.9 (0.31)	<0.001
Education (%)				
< High School Graduate	16.8	14.7	1.8	<0.0001
High School Graduate	29.1	30.1	12.2	
> High School Graduate	54.2	55.2	86.0	
Annual income (%)				<0.0001
< $30,000	19.7	17.3	2.5	
$30,000–39,999	16.4	14.4	6.8	
$40,000–49,999	18.2	19.9	4.7	
$50,000–59,999	6.9	10.2	13.3	
$60,000–69,999	6.3	3.3	10.8	
≥ $70,000	32.6	34.9	61.9	

*Differences among the supplement user groups were evaluated using chi-square methods for categorical variables and one-way analysis of variance for continuous variables.









CONCLUSIONS

Users from the long-term multiple dietary supplement group consumed a broad array of vitamin/mineral, herbal, and condition-specific dietary supplements on a daily basis. They were more likely to have optimal concentrations of chronic disease-related biomarkers, and less likely to have suboptimal blood nutrient concentrations, elevated blood pressure, and diabetes compared to non-users and multivitamin/mineral users. These findings should be confirmed by studying the dietary supplement usage patterns, health, and nutritional status of other groups of heavy users of dietary supplements.