Attitude about coenzyme Q10 supplements among cardiac patients

Abstract:

Background: This study aimed to assess attitude of cardiac patients about Coenzyme Q10 supplements.

Methods: A cross-sectional study using convenience sampling based on inclusion and exclusion criteria was conducted among cardiac patients. This study was conducted using a self-administered questionnaire, derived from extensive literature reviews.

Results: Study subjects were found to have average attitude (n= 87, 64.9%) towards Coenzyme Q10 supplementations. This study found strong positive correlation between the knowledge score and attitude score (r=0.776, p<0.05). It was found that 7 (46.67%) of study subjects who consumed the Coenzyme Q10 supplements were recommended by friends and family.

Conclusion: The attitude towards Coenzyme Q10 supplements reflected the low pattern of use, and emphasized the role of healthcare providers to increase awareness about the benefits of Coenzyme Q10 supplements among cardiac patients as well as to educate them about its interaction with some drugs.

Key words:
Coenzyme Q10, Knowledge, Attitude, Pattern of use, Cardiac patients

Introduction

Cardiovascular diseases (CVDs) are amongst the most prevailed diseases affecting patients from all over the world. High death rates are associated with having one or more CVDs and are considered as one of the leading causes of death over the past 15 years. It was estimated that more than 54% of deaths were results of these diseases worldwide [1].

Over time conventional pharmacotherapies for CVDs such as beta blockers, angiotensin-converting-enzyme inhibitors, calcium channel blockers, and many other classes with proven efficacy in alleviation of cardiac disease states were established, but are associated with undesirable side effects, and adverse reactions [2]. Hence, the need for complementary and

alternative medicine (CAM) is emerging due to their synergistic effects when used with evidence-based prescribed therapies [3].

One example of such complementary remedies is Coenzyme Q10 (CoQ10) [4]. CoQ10, which is a small lipophilic molecule, was discovered in 1957 and has been used in studies involving heart failure patients and general heart disease patients since the 1980s [5]. CoQ10 is present naturally inside of the human body. It is situated inside the mitochondria and is essential for the transfer of electrons for the ultimate production of the main energy source in the body which is adenosine triphosphate (ATP) [6].

Roles of CoQ10 in the body are to aid in energy production inside body cells, to act as an antioxidant to neutralize harmful free radicals, to protect smooth functioning of blood vessel's endothelium and lymph vessel, and to increase the supply of energy in heart's muscles. Some studies have shown that CoQ10 improves the symptoms of CVDs, and prolongs survival in cardiac patients. CoQ10 is recommended to be taken daily with a dose of 75- 360 mg [7]. This study aimed to assess attitude about Coenzyme Q10 supplements among cardiac patients.

Materials and methods

This was a cross-sectional study done and a self-administered questionnaire was employed. The study subjects were screened for inclusion and exclusion criteria. At first, information sheet was handed to patients and informed consent was taken. The questionnaire was delivered personally to the patients by the researcher who also collected them back after they completed the study. The sampling method employed was convenient sampling.

Sample size was calculated according to Z2 x (p) x [(1-p) / C2] where Z is the standard normal distribution = 1.96 at 95% confidence interval; p is the hypothesized proportion of outcome of interest and C is the acceptable allowable error of 0.05. Sample size was then corrected according to the estimated population of both the urbanized and rural settlements.

A self-administered questionnaire was used as a research tool to evaluate patients' attitude and about CoQ10 supplements. The questionnaire was adopted and adapted from a previous study [8, 9]. The research questionnaire had two parts assessing socio-demographic characteristics and attitude about CoQ10 supplements. The first part assessed the socio-demographic characteristics of the participants such as age, gender, ethnicity, educational level, occupation, income, and main diagnosis. The second part assessed the attitude of patients about CoQ10 supplementation using 5-point Likert scale, and consisted of 10 questions that indicated the extent to which patients agreed or disagreed with each statement. Each statement ranged from 'strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree' and scored as (strongly disagree =1, disagree =2, neutral =3, agree =4, strongly agree=5) [10]. Scores were summed and a total score was obtained for each patient. The mean score was calculated (mean =32.84), and positive attitude was interpreted for scores equal or more than the mean. Content validity of the questionnaire was checked before start of the study. During the pilot study, 20 patients were approached and the questionnaire was handed. Reliability of the questionnaire was assessed using Cronbach's alpha

which is the most common tool to be used to measure internal consistency [12]. Cronbach's alpha results were obtained as 0.964.

All data were analyzed using Statistical Package for Social Sciences (SPSS) software (version 24) to interpret data. Relevant types of statistical analysis were conducted for interpretation of data. Normality of the data was checked (kurtosis of normally distributed data falls between +2 and -2) [13]. Normally distributed continuous data was described in mean and standard deviation. Categorical data was described as frequency and percentage. For inferential statistics such as the correlation between knowledge scores, Pearson correlation test was used because it was found normally distributed. One-way analysis of variance (ANOVA) is used to determine whether there are any statistically significant differences between the means of three or more independent groups.

Results

As shown in table 1, the mean (SD) age of the respondents for this study was 58.51 (8.531) years. Non elderly patients, considering elderly age to be over 60 years old [14], are the majority of the study subjects. Majority of the patients were males and the major proportion of the study subjects received secondary education, had a monthly income of below than 700 USDs, and was diagnosed with acute coronary syndrome.

Table 1: Socio-demographic characteristics of the study subjects (n=134)

Characteristics	Frequency (%)	Mean (SD)
Age (years)		58.51 (8.531)
Non-elderly (<60 years)	63 (47%)	
Elderly (≥60 years)	71 (53%)	
Gender		
Male	120 (89.60%)	
Female	14 (10.40%)	
Education		
No formal education	13 (9.70%)	
Primary education	12 (9.00%)	
Secondary education	66 (49.30%)	
Tertiary education	43 (32.1%)	
Higher education: diploma	18 (13.40%)	
Higher education: bachelor	19 (14.20%)	
Post-graduate degree	6 (4.50%)	
Occupation		
Professional	54 (40.30%)	
Technical	28 (20.90%)	
Clerical	11 (8.20%)	
Self employed	10 (7.50%)	
Unemployed	16 (11.90%)	
Pensioner	15 (11.20%)	

Gross Monthly Income (USDs)	
< 700	68 (50.70%)
700-1500	33 (24.60%)
1500-3000	23 (17.20%)
< 3000	10 (7.50%)
Diagnosis	
Acute coronary syndrome	71 (53.00%)
Hypertension	22 (16.40%)
Heart failure	26 (19.40%)
Atrial fibrillation	15 (11.20%)

As shown in table 2, the mean (SD) of the attitude is 32.84 (5.914). Most of the study subjects had negative attitude toward CoQ10 supplements.

Table 2: Attitude of patients towards CoQ10

Attitude	Frequency (%)	Mean (SD)
		32.84 (5.914)
Positive attitude (≥32.84)	47 (35.1%)	
Negative attitude (<32.84)	87 (64.9%)	

This study showed a statistically significant (p=0.007) weak positive correlation (r=0.232) between attitude score and age implying that attitude increases upon the increase in age. In addition to that, there was a significant difference (p=0.028) in attitude scores between both age groups, where elderly patients showed better attitude as compared to non-elderly, as shown in table 3.

Table 3: Attitude towards CoQ10 supplements

	n	Mean (SD)	*p*-Value*
Gender			
Male	120	29.17 (1.69)	0.009[a]
Female	14	30.56 (3.57)	
Age			
Non-elderly	63	31.79 (3.048)	0.007[c]
Elderly	71	34.03 (3.689)	
Gross Monthly Income (USDs)			
< 700	68	27.59 (2.928)	0.041[b]
700-1500	33	28.15 (2.514)	
1500-3000	23	30.22 (3.288)	
< 3000	10	32.20 (4.590)	
Diagnosis			
Acute coronary syndrome	71	30.29 (2.427)	
Hypertension	22	28.78 (2.108)	0.006[a]

Heart failure	26	29.05 (2.333)
Atrial fibrillation	15	29.82 (1.289)

a Independent-samples t-test
b One-Way ANOVA test
c Pearson correlation test
* p <0.05 shows significance

As shown is table 4, this study revealed a statistically significant (p=0.001) strong positive correlation (r=0.776) between knowledge score and attitude score, implying that knowledge level increases with the increases in attitude.

Table 4: Correlation between score attitude and knowledge score

Characteristics	Attitude score
Knowledge score	0.776[c] (0.001)*

c Pearson correlation test
* P value <0.05 shows significant

Discussion

Elderly patients comprised of 47% of the study subjects, which is very probable and expected because age is known as one of the main risk factors of CVDs [15]. By the onset of getting older, symptoms of cardiovascular disease often start to appear because as the body age, the heart becomes weaker and the blood vessels become less flexible, making it harder for blood to move easily. In addition to that, poor nutrition, poor exercise habits, tobacco smoking, and diabetes mellitus can increase the risk of CVDs [16]. But for the non-elderly to be a majority in this study (53%) maybe due to sedentary lifestyles adopted by young adults with addition to consumption of unbalanced diet [17]. Men are three times more likely to have ACS than women due to gender differences in psychosocial and behavioral coronary risk factors [18].

The majority of study subjects received only secondary education. Coronary risk factors increase with decrease in educational level of the patients, and education level is considered one of the factors associated with delay in seeking medical treatment [19,20]. Low financial status is a risk factor for the incidence of CVD, and hospitalization causes a financial burden to ACS patients, which can affect the outcome of therapeutic plan [21].

Most of the study subjects had ACS episodes because the study site is a cardiology referral center in the region thus it is not surprising that they handled more ACS cases than other institutions. In many countries CAD is one of the leading causes of mortality, accounts for 20-25% of all deaths in public hospitals [22]. Add to that, more than 2.5 million hospitalizations are due to ACS worldwide. In Australia, the number of ACS hospitalizations has increased 79% from 1993 to 2008 for acute MI and 33 % for UA, resulting in 95,000 hospitalizations in 2008 [21].

In this study, majority of the subjects did not take the supplements (88.8%) because they did not know about it or thought that the supplement was unnecessary. The majority of study subjects that used the supplement revealed that the reason for taking CoQ10 was for an existing heart condition. Most of the study subjects were recommended by their friends or family. All the study

subjects did not experience any side effect while using CoQ10 supplements. Most of the study subjects revealed negative attitude towards CoQ10 supplementation, because knowledge influences behavior through attitudes. The more knowledgeable patients are about the products, the higher their sense of safety and acceptability towards the products, leading to increase in their trend of consumption [25].

Elderly patients are shown to have more positive attitude values than the non-elderly patients because older patients tend to consume more supplements than younger patients, thus resulting in a more positive attitude [24]. As an understanding, usually knowledge level increases with the increase in attitude score. This can be interpreted that the more knowledgeable the patients are, the more positive their attitude towards CoQ10 supplementation and patients' knowledge about herbal products and dietary supplements was linked to increase in use. In this cohort of the patients, patients also didn't have good knowledge that's why their attitudes were also not positive. Patients with increased knowledge tend to consume more supplements [26]. Most of the study subjects stated that their friends or family that recommended them to consume CoQ10. This was to be expected as the prescribing trends were low thus this might link to the low recommendation and prescribing trends by doctors in this population [27].

Conclusion

This study discovered that most cardiac patients enrolled had an average attitude towards CoQ10 supplements. These findings indicate the necessity of a comprehensive education program targeting not only cardiac patients but also their healthcare providers to improve their awareness about the potential benefits and concerns from using supplements and complementary medicine.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

NOTE:

The study highlights the efficacy of "herbal products" which is an ancient tradition, used in some parts of India. This ancient concept should be carefully evaluated in the light of modern medical science and can be utilized partially if found suitable.

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