

Investigation of selenium levels in patients with fibrocystic breast disease

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ABSTRACT

The present study was conducted to compare serum selenium levels in patients with breast pain. Patients with fibrocystic disease (FCD) and other breast pathologies were divided into two groups. Biochemical analysis and some habits of patients admitted to the general surgery outpatient clinic with breast pain were reviewed retrospectively. The serum selenium levels were found to be lower in patients with FCD than in those with other breast pathologies ($P < 0.00001$). At the same time, tea and cigarette consumption was higher in patients with FCD having breast pain ($P = 0.026$ and $P = 0.034$, respectively). The serum selenium level was lower in patients with FCD who had breast pain than in patients with other benign breast pathologies. Tea and cigarette consumption was higher in these patients than in other patients. Further studies should monitor serum selenium levels indicating whether selenium supplementation is effective in patients with FCD.

Key words: Breast pain, fibrocystic breast disease, selenium

INTRODUCTION

Breast pain is seen in 41%–79% of women. It may lead to breast cancer in women and adversely affect daily life activity (1-3). Mastalgia can be categorized into four types: cyclic breast pain, noncyclic breast pain, chest wall pain, and pain from outside the chest wall (2). A strong relationship exists between breast pain and psychiatric disorders (anxiety and depression) and alcohol use and trauma history (3). In addition, stress, caffeine, smoking, lactation frequency, and breast benign disorders are associated with mastalgia (4). Cancer-related breast pain is noncyclic, unilateral, and well localized and is seen in 1.2%–3.2% of patients (5,6). It is recommended to reduce weight and salt intake while managing mastalgia and pain (7). Iodine and selenium use was reported to reduce nodularity and the need for pain medication to relieve breast pain (8). The aim of this study was to compare the serum selenium levels of patients with pure fibrocystic changes in patients with breast pain and those with other breast pathologies.

MATERIALS AND METHODS

Between June 1, 2018, and November 1, 2018, the files of patients who presented to the general surgery outpatient clinic with complaints of breast pain were reviewed retrospectively. Serum selenium levels were studied, and ultrasonography (USG), mammography, biochemical tests (cholesterol, triglycerides), and prolactin levels were recorded from the hospital information system, which was routinely used in the follow-up of patients with breast pain. Patients who underwent all the radiological and biochemical tests were included in the study. They were randomly assorted into two groups ($n = 30$ in each group). Thirty patients diagnosed with pure fibrocystic disease (FCD) in Group 1 and 30 patients diagnosed with other than FCD in Group 2 were compared. No informed consent was required because this was a retrospective study and no

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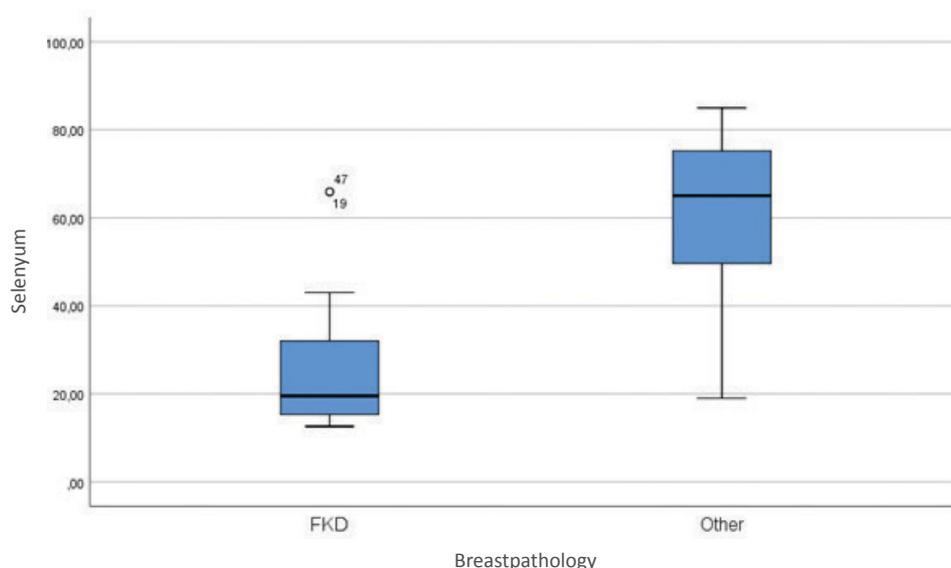


FIGURE 1: Serum selenyum levels in FCD and other breast benign diseases.

identification data were used for the patients. Data were analyzed using the SPSS program (Version 25.0; SPSS Inc., IL, USA). The nonparametric Mann–Whitney U test was used to analyze the data of the two groups that did not show a normal distribution (no normal distribution due to the Shapiro–Wilk test result being <0.05). Nominal data were analyzed by the continuity correction test.

RESULTS

A total of 60 patients with breast pain were included in the study. The USGs of patients revealed the presence of pure FCD in Group 1 and FCD and/or other diseases in Group 2. The mean age of the patients was 42.2 ± 9.97 years (min: 21; med: 42.5; max: 63). When the selenium levels of the patients were compared, the mean selenium level in Group 1 was 24.99 ± 14.15 , and the mean selenium level in Group 2 was 59.58 ± 19.60 (Figure 1). The selenium level was significantly lower in Group 1 than in Group 2

($P < 0.00001$) (Table 1). Patients in Group 1 reported that they consumed significantly more tea than the patients in Group 2 ($P = 0.026$). The serum selenium levels were found to be significantly lower in patients consuming tea very frequently ($P < 0.00001$). Smoking was significantly higher in Group 1 than in Group 2 ($P = 0.034$) (Table 2). The serum cholesterol, triglyceride, and prolactin levels were not significantly different between the groups ($P = 0.160$, $P = 0.141$, and $P = 0.311$, respectively).

DISCUSSION

In this study, blood tests and some habits of patients with FCD having breast pain and other breast pathologies were compared. It provided information that can be used in treating breast pain and cysts in patients with FCD. A parallel relationship exists between breast pain and the size, number, and nodularity of cysts in FCD (8). Therefore, the pain is reduced with the shrinkage of the cysts in the breast. Iodine use was reported to be effective in patients

Breastpathology	N	Mean	Median	Std. Deviation	U	P
Selenyum	FKD	30	24,9927	19,5000	14,15038	81,500
	Other	30	59,5807	65,0000	19,60453	< 0.0001

TABLE 2: Comparison of FCD and other breast benign diseases with high tea consumption.

			FKD			Continuity Correction	P
			FKD	Other	Total		
Tea Consumption	Low tea consumption	Count	5	14	19	4.929	0.026
		% within TC	26,3%	73,7%	100,0%		
	Very tea consumption	Count	28	13	41		
		% within TC	68,3%	31,7%	100,0%		
Smoking	I don't smoke	Count	7	16	23	4.512	0.034
		% within smoking	30,4%	69,6%	100,0%		
	I smoke	Count	23	14	37		
		% within smoking	62,2%	37,8%	100,0%		
Total	Count	30	30	60			
	%	50,0%	50,0%	100,0%			

with breast pain and tenderness (9). The addition of gamma-linolenic acid and selenium to the diet of patients with iodine has been reported to reduce nodularity by reversing the effects of 17-beta-estradiol in the breast (10). In the present study, the serum selenium levels were found to be below the normal values in most patients with FCD. Selenium is a component of the glutathione peroxidase enzyme, which protects the cell from the negative effects of hydrogen peroxide and organic peroxides by means of its anti-oxidant properties (11). Selenium strengthens the immune system, increases the yawning ability of the heart and vessels, regulates thyroid functions, and increases fertility in men and women. Selenium, above all, acts as an anti-cancer agent (12). It has a protective effect by binding to toxic metals such as cadmium, arsenic, mercury, and lead. Reduction of selenium intake has been reported to increase the risk of breast, lung, prostate, and colon cancers (13,14). A serum selenium level above 64.4 µg //L has positive effects on the treatment (15). However, care should be taken to avoid selenium toxicity when using selenium to prevent cancer. Taking more than 400 µg of selenium daily has been reported to cause toxic effects. Among the toxic effects of selenium, loss of vision, muscular and tooth decay, bad taste and odor in the mouth, skin changes, hair loss, and nail breakage have been reported. Therefore, intake of 55–70 µg of selenium supplement per day has been recommended (16). The results of this study indicated that the majority of patients with FCD had low selenium levels. Supplementation with routine selenium in addition to foods may cause toxic effects while treating patients with FCD. Therefore,

it is recommended that selenium supplementation and serum selenium levels should be monitored in patients with low serum selenium levels. In the present study, the serum selenium levels were found to be low in patients who consumed tea very often. Low serum selenium level, depending on the substances in the tea due to the deterioration of selenium absorption shows that develops (17). No previous study investigated the use of selenium replacement therapy in patients with FCD who had low serum selenium levels. Therefore, further studies are needed to examine the selenium level in a larger FCD population and explore the use of selenium replacement therapy in patients with low selenium levels.

CONCLUSIONS

Serum selenium levels were found to be low in most patients with FCD. Tea and cigarette consumption was higher in these patients than in other patients. It is more appropriate to look at the serum selenium level before selenium supplementation to patients' diet. However, further studies should monitor serum selenium levels indicating whether selenium supplementation is effective in patients with FCD.

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