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CALCIUM LEVELS IN BREAST CANCER PATIENTS

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Abstract : Background; Breast cancer is a disease in which certain cells in the breast become abnormal and grow uncontrollably and form tumors. The development of this cancer can be seen through the rise and fall of blood chemical levels. This research raises the value of calcium levels in the blood because calcium is a versatile element that participates in cell signaling for various cell processes such as cell death and development. The aim of this study was to determine the value of calcium levels before and after mastectomy surgery

Research method: The method in this research is quantitative by looking at the calcium level values before and after mastectomy surgery. The sample used was 50 respondents with breast cancer. The analysis used is frequency distribution and Paired t-test

Research result; Mammary cancer occurs in mothers who do not breastfeed as much as 68%. there was a decrease in calcium levels before and after surgery, initially there was 12% calcium levels above normal to 0%. The test result is a sig value of 0.00, this shows that there is a difference between calcium levels before and after breast cancer surgery.

Conclusion; The conclusion of this study is that the calcium level values after mastectomy surgery tend to decrease and there are differences in calcium level values before and after surgery.

Keywords: calcium, cancer, breast, surgery

I.INTRODUCTION

Breast cancer is a disease in which certain cells in the breast become abnormal and multiply uncontrollably and form tumors, causing genetic changes in the breast epithelial cells.[1]. The development of this cancer can be seen through the rise and fall of blood chemical levels. Several previous studies have carried out several values for blood chemical levels. This research raises the value of calcium levels in the blood.

Calcium is an important element that influences cell signaling in various cell processes such as death, cell cycle, division, and others. On the other hand, research results show that breast cancer uses calcium signaling as an advantage to develop[2]. The normal range for serum calcium levels is 8.8-10.8 mg/dL[3].

Tabel 1. Respondent Characteristics (n=50)

Characteristics	Indicators	Number of	Percentages (%)
Age	30-40 years	12	24.0
	>40 < 50years	23	46.0
	≥ 50 years	15	30.0
Location	sinistra	29	58.0
	Dekstra	21	42.0
long breastfeeding	0-12 months	10	20.0
	>12-24 months	6	12.0
	not breastfeeding	34	68.0
Number of parturitions	1-2	30	60.0
	≥ 3	14	28.0

In breast cancer patients, complications often occur with hypercalcemia, which is a value above normal[4][5] Hypercalcemia is seen in almost all cases of advanced breast carcinoma and serum calcium values are higher in stages III and IV[6][10].. The results of other studies also found high calcium levels in the diagnosis of breast cancer[7]. Serum calcium levels in this condition are greater than 10.8 mg/dL, which can be life-threatening[8]. The patient had hypercalcemia with calcium values above normal at the time of her breast cancer diagnosis[9]. Postmenopausal women with breast tumors had significantly higher serum calcium values[4]. Hypercalcemia in patients with cancer can be caused by hypercalcemia of malignancy.[11].

This research is important because there are still different research results which are the results of meta-analyses confirming an inverse relationship between calcium and breast cancer risk[12]. In fact, the results of other studies show that tumors and breast cancer cells have intracellular calcium concentrations and/or increased capacity to mobilize calcium.[2]. The results showed that 16 of 63 patients (25.4%) had symptoms of hypocalcemia[13]. On the other hand after surgery, there is a significant decrease in serum calcium values after treatment of the disease which is mostly surgical treatment[6]. The aim of this research is to reassure calcium levels in breast cancer sufferers before and after surgery.

II.RESEARCH METHODOLOGY

The method in this research is quantitative by looking at the calcium level values before and after mastectomy surgery. Samples were taken from patients who came to the oncology specialist clinic 1 day before surgery and post-operative measurements were taken at the time of the first control patient, namely 10 days after surgery.Venous blood samples were taken from patients diagnosed with (suspected) breast cancer before surgery as much as 3 ml without anticoagulants. then carried out according to the procedure. The analysis used is central tendency and the Paired T-test, which is used to test the difference in calcium levels before and after breast cancer surgery.

III.RESULTS AND DISCUSSION

RESULTS

Characteristics of respondents, the total respondent data is 50 patients, the patient's age is between 30 years and 60 years. The highest number of cancer sufferers in terms of age was ≥50 years old, 30.0% or 15 out of 50 respondents. between the ages of 30-40 years, 12 cases of cancer were found. Mammary cancer occurs in mothers who do not breastfeed as much as 68%. Meanwhile, the location of most cancers is in the left breast at 58% and the most cancers in mothers with 1-2 children are 60%, this data is shown in table 1.

This descriptive analysis shows that pre-operative breast cancer calcium levels were above normal in 6 cases (12%) within the normal range, there were 34 (68%) and 10 cases (20%) had calcium values below normal (n=50). .

The results of this study showed that there was a decrease in calcium levels before and after surgery, from 12% calcium levels above normal to 0% (table 2).

The test results using Paired T-test analysis are a sig value of 0.00, (Table 2) this value is below the standard significance value (sig ≤ 0.05), this shows that there is a difference between calcium levels before and after breast cancer surgery.

Discussion

Blood calcium levels before surgery

Judging from the high and low levels of calcium before surgery in this study, it was found that only 6% of calcium values were above normal, whereas the results of several previous studies showed the presence of hypercalcemia.

The results of this study are indeed different from previous research on pre-surgery, namely that the results show that breast cancer tumors and cells have an increased calcium capacity[2], Other studies also show that pre-operative patients have hypercalcemia [9]. And hypercalcemia is seen in almost all cases of advanced breast carcinoma and in stage III and stage IV disease [6]. Hypercalcemia in patients with cancer can be caused by malignancy[11]. The results of another study showed that of 3602 patients diagnosed with breast cancer, all patients had symptoms related to hypercalcemia[14].

Table 2. Hypothesis test results and normal, below normal and above normal calcium levels

		Sig.	Number of cases		
			below normal (%)	Normal (%)	Above normal (%)
Pair 1	preopkalsium	0,00	10 (20%)	34 (68%)	6 (12%)
	posop kalsium		30 (60%)	20 (40%)	0

Normal values for calcium levels: 8,8-10,8 mg/dL

High blood calcium values sometimes occur if breast cancer is advanced[10]. Postmenopausal women with breast tumors had significantly higher serum calcium values[4]. Different research results found that metastatic breast cancer causes hypocalcemia[15]. In this study, the value of calcium levels in post-operative breast cancer, the calcium value of 10 cases (20%) had calcium values below normal (n=50) can be seen in table 2.

Blood calcium levels after surgery

The results of this study showed that there was a decrease in calcium levels before and after surgery, from 12% calcium levels above normal to 0% (table 2). Previous research results also found that there was a significant decrease in serum calcium values after disease treatment, most of which was surgical treatment [6]. Postoperative research results showed that 16 of 63 patients (25.4%) had symptoms of hypocalcemia[13].

Hypothesis testing results

The test results using Paired T-test analysis are a sig value of 0.00, (Table 2) this value is below the standard significance value (sig ≤ 0.05), this shows that there is a difference between calcium levels before and after breast cancer surgery. This is made clear by the normal values for calcium levels before and after surgery, which are 68% and 40% respectively. This calcium value shows both pre- and post-operative values in the mostly normal category, the normal range for serum calcium is 8.8-10.8 mg/dL[3]. This result is also shown by the data that calcium levels fell after surgery, initially hypocalcemia before surgery was 12% calcium levels above normal and fell after surgery to 0%.

Conclusion

The conclusion of this study is that the value of calcium levels after mastectomy surgery tends to decrease and there is a difference in the value of calcium levels before and after surgery.

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