Relationship between tumor markers CEA and CA15-3 and recurrence breast cancer

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ABSTRACT

  The value of clinical use of tumor markers CEA and CA15-3 for early detection of recurrent breast cancer still is a controversial. This study was investigated relationship between tumor markers CEA and CA15-3 and recurrence breast cancer. Data regarding 147 women who had breast cancer were entered into the study. Patients were reviewed for 120 months after treatment. Maximum time for relapse was considered a 6 months. Results were showed recurrence cancer in 20% of diagnosed patients. All of them in diagnosis time had a higher of normal tumor markers (CA<3, CA15-3<30).These observations indicated that CA15-3 is a sensitive tumor marker for diagnosis especially for recurrent breast cancer.

Keywords: Breast Cancer, Tumor markers, CEA and CA15-3, Recurrence cancer

INTRODUCTION

Breast cancer is the most common female-related cancer that leads to death in the mostly women worldwide [1]. As a normal cell transforms to a neoplastic cell, changes occur both within and on the surface of the cell that could potentially be detected and used as a tumor marker. This could provide valuable information on the status of the cell at the given point thus enabling early detection, which is key to cancer cure and prevention [2,3]. Recurrence of cancer after the diagnosis is unavoidable issues. To prevent or reduce relapse, various treatments including surgery, chemotherapy, radiotherapy and other treatments are applied. But one of the tools for the diagnosis of breast cancer and predict recurrence are tumor markers. However, the predictive value of tumor markers in prediction of disease recurrence is controversial. Tumor markers in breast cancer are extremely various in number and type. Mucins e.g. CA15.3 [4,5].and CA 27-29 [6]. , oncofoetal proteins (e.g. CEA) [7,8]., oncoproteins e.g. HER2 [9-11]. c-myc [12]. and p53 [14,15].,cytokeratins e.g. TPA [16,17].and ESR [18-20]. are among the many proposed as a tumour marker for breast cancer. More recent tumour markers described in the literature include Mammaglobin [21]., survivin [22,23., livin [24]., NYESO- 1 [25]., Annexin XI-A [26]., Endostatin [27]., Hsp90 [28]., p62 [29]. and koc [30]. In this study, we investigate relationship between tumor markers CEA and CA15-3 to Breast cancer recurrence for patients in west mazandaran

MATERIALS AND METHODS

In this study–retrospective**,** Women with breast cancer were studied in West Mazandaran with tumor markers CEA and CA15-3, and recurrence was evaluated. Recurrence was defined as reappearance of symptoms after a period of free of the disease in the clinical examination or diagnostic procedure (In this study, CEA <3 and CA15-3 <30 as normal was considered). Patients were followed for 120 months, Mean age in the age range 24 to 80 Years. 51.3%, patients in stage Ⅰ, Ⅱ and 46.9% of patients with stage Ⅲ and Ⅳ of disease. 95.2% of patients undergoing complete resection of breast and 4.8% of patients were removed part of their breast. Demographic data were recorded in the corresponding checklist. The data's after coding were analyzed by statistical software (SPSS 18).
Patients who did not complete their records and those records were not recorded tumor marker in diagnosis process, were excluded.

RESULTS

Follow up of 147 Patients, with to measurement of the CEA, CA15-3 markers in relapsed them 20%. The tables 1 and 2 show the abundance of patients with breast cancer recurrence compared with patients without recurrence based on Status of CA15-3 and CEA markers. The result of obtained from Fisher's Exact Test show that were obtained Significant relationship between recurrence cancer and Status of CA15-3 markers, but statistical analysis show CEA is a low sensitivity markers obtained Significant relationship between recurrence cancer. Also, were not obtained significant relationship between recurrence cancer and duration, multiplicity of chemotherapy in the patients that, shows in the table 3.

Table 1. The abundance of patients with breast cancer recurrence compared with patients without recurrence based on Status of CA15-3.

		CA15-3				All	
		Normal		High			
		Abundance	%	Abundance	%	Abundance	%
Recurrence cancer	Yes	4	14.3	24	85.7	28	100
	No	107	89.9	12	10.1	119	100
All		111	75.5	36	24.5	147	100

* p-value : 0.0001, Fisher's Exact Test

Table 2. The abundance of patients with breast cancer recurrence compared with patients without recurrence based on Status of CEA.

		CEA				All	
		Normal		High			
		Abundance	%	Abundance	%	Abundance	%
Recurrence cancer	Yes	14	50	14	50	28	100
	No	95	79.8	24	20.2	119	100
All		109	74.1	38	25.9	147	100

* p-value: 0.003, Fisher's Exact Test

Table 3. The abundance, mean , minimum , maximum of CEA ،CA15-3، markers , duration and multiplicity of chemotherapy in the patients with breast cancer recurrence compared with patients without recurrence.

	Recurrence cancer	Abundance	mean	minimum	maximum	p-value
CEA	yes	28	11.4	0.2	94.7	0.0001
	No	119	2.2	0.1	15.60	
	All	147	3.9	0.10	94.7	
CA15-3	yes	28	74.5	13.5	319.1	0.0001
	No	119	22.3	1.96	223	
	All	147	32.2	1.96	319.1	

DISCUSSION

Molina and colleagues reported that only 13% of patients with primary breast cancer had an elevated serum CEA whilst 18.8% had a rise in CA15.3 [31].

In a study in 2010 by Samy and et al [32]. in Egypt, 81 patients with breast cancer (Stage Ⅰ, Ⅱ) were enrolled.

All patients underwent mastectomy or canserative treatment. Recurrence was observed in 9 patients followed for 18 months. The CEA and CA15-3 levels significantly higher in patients with recurrent disease.

Lumachei and et al [33] in 2010, 362 women with breast cancer who had undergone surgery were followed for at least 36 months.

During follow up 62 patients (1/17 percent) relapsed. In this study the authors concluded that CA15-3 and CEA markers are acceptable factors for recurrence predicting at the time of diagnosis , but in older women (above 64 years), initial levels of tumor markers in recurrence predicting is not applicable.

Mariani and et al [34] studied 900 patients with breast cancer and was evaluated sensitivity and specificity of different tumor markers for distant recurrence. In this study the authors concluded

CA15-3 and CEA markers is weakly effective in distant recurrence.

Lumachi and et al [35], reported, in patients with breast cancer, serum markers CEA and CA 15-3 correlate exclusively with the size of the tumor. Both have low sensitivity and no significant relationship with other prognostic factors could be found. Thus, preoperative CEA and CA 15-3 serum levels measurements are of little value, especially in patients with early-stage breast cancer, and are not useful in the therapeutic decision-making for patients with breast cancer. Prabasheela and et al [36], reported CA 15-3 is a well established tumor marker for early detection of recurrent breast cancer. They were investigated Blood samples for CA 15-3 level in 50 histopathologically proven breast cancer patients of which 30 patients are untreated and 20 had under gone primary surgery in comparison with 50 normal healthy persons (control) of similar average age limit and body mass. Serum levels of CA 15-3 were significantly in breast cancer patient (p <0.05).

Berberoglu and et al [37], indicated that CA 15-3 is a sensitive tumor marker for diagnosis and especially for monitoring of breast cancer patients. In this study, patients with breast cancer and high tumor marker CA15-3 have shown a higher recurrence.

CONCLUSION

The existence of an independent factor for tumor markers CA15-3 at the time of diagnosis and the results from this study showed in the incidence of recurrence.

Important results of this study is that perhaps can be predicted the risk of recurrence in patients only a measurement of CA15-3 and CEA markers, especially CA15-3 at the time of diagnosis and will design treatment plan of these patients for recurrence reducing from the early stages. To prove this relationship, and according to inconsistent and similar studies with this study, need more study with larger sample size.

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