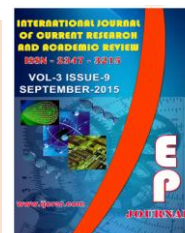




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Evaluation of Serum Free Prostatic Specific Antigen in Female Breast Disease

Jasim M. AL. Mohana*, Hassan Abdulla Abadi AL- Aquli and Hamed Z. AL –Saiegh

Department of Surgery, University of Kufa, Faculty of Medicine, Iraq

*Corresponding author

KEYWORDS

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A B S T R A C T

Prostate specific antigen expression has been reported in a wide variety of tumors exp melanoma, lung tumor, pituitary tumor, and also has now been shown in benign breast diseases such as fibro adenoma and in normal breast tissue as well as in tumors that is mainly in free form. This made the basis of using free serum Prostatic specific antigen as diagnostic tumor marker in breast disease. Aim of the study is to evaluate serum free prostatic specific antigen as diagnostic tumor marker in female breast cancer. This is a prospective study included 132 women who visit the breast clinic for breast cancer screening. The histopathological result show that 72 cases where breast carcinoma while 60 cases where fibroadenoma. The serum sample were taken from both groups and considered as preoperative free serum Prostatic specific antigen. Patients with benign breast lump did lumpectomy while those patients with malignant breast mass did modified radical mastectomy. Then at day 10 postoperatively, another serum sample were taken and measured and considered as postoperative free serum Prostatic specific antigen. All the results of the free serum Prostatic specific antigen were measured via a new technique by a device called Minividas. Pair-t-test was used to determine significant differences between preoperative and postoperative free serum Prostatic specific antigen. This study includes 132 female patients with breast lump. Their age ranged from 15 to 65 years. Of those, 72 patients have breast cancer while 60 patients have breast fibroadenoma. This study shows that patients with breast fibroadenoma had lower level of serum free Prostatic specific antigen postoperatively than preoperatively that is statistically significant. Also it has been shown that patients with breast cancer had a lower level of serum free Prostatic specific antigen postoperatively than preoperatively that is also statistically significant. Serum Free Prostatic specific antigen can be used as serological breast tumor marker in the diagnosis and follow up of patients with breast benign and malignant diseases.

Introduction

Prostate-specific antigen (PSA) is a serine protease with a single chain glycoprotein (Bangma *et al.*, 1997). With the availability

of highly sensitive immunoassays it has become apparent that PSA is expressed in non prostatic tissues (Diamandis, 1995).

PSA expression has now been shown in normal breast tissue and in benign breast disease such as fibroadenoma as well as in malignant breast disease by using techniques such as Immunocytochemistry (Diamandis, 1997). The highest expression of PSA in breast tissue is seen in benign diseases, and the lowest expression is seen in advanced stage cancerous tissue, suggesting that PSA expression in malignant breast tissues is generally lower than in benign hyperplastic foci or healthy tissue.

Free PSA cannot interact with the protease inhibitor in the circulation. This difference could form the basis of a diagnostic serological test for breast cancer (Yu and Diamandis, 1995; Yu *et al.*, 1994). The objective of this study is to evaluate serum free prostatic specific antigen as diagnostic tumor marker in female breast cancer.

Patients and methods

This is a prospective study was conducted in the breast clinic in Alsader medical city in the period between 1st of January 2008 to the 1st of January 2015. This study includes 132 women who visit the breast clinic for breast cancer screening. Those 132 patients with breast lump found to have different benign and malignant breast disease on core needle biopsy.

Patients with benign breast lump did lumpectomy while those patients with malignant breast mass did modified radical mastectomy. The postoperative histopathological results show that 72 patients were found to have breast carcinoma while 60 patients were fibroadenoma. The serum sample were taken from both groups and considered as preoperative serum free PSA.

Then day 10 postoperatively, another serum sample were taken, measured and considered as postoperative serum free PSA. Serum free PSA were measured via a new technique using a device called Minividas which is an automated test used for quantitative measurement of free PSA in the human serum or plasma by using ELFA (enzyme linked fluorescent assay). The assay principle combines a two steps enzyme immunoassay sandwich method with a final fluorescent detection step. The sample is cycled in and out of the solid phase receptacle several times. Pair-t test was used to determine significant differences between preoperative and postoperative serum free PSA.

Result and Discussion

This study includes 132 female patients with breast lump who visit breast clinic for breast carcinoma screening. Their age ranged from 15–65 years. The age distribution of patients and the number of patients with breast fibroadenoma and carcinoma was shown in table 1. The histopathological results of those 132 female patients reveal that 72 patients have breast cancer while 60 patients have breast fibroadenoma.

The median values for serum free PSA in patients with breast fibroadenoma shown in table 2. The result reveal that patients with breast fibroadenoma had lower level of serum free PSA postoperatively than preoperatively that is statistically significant. The median values for serum free PSA in patients with breast cancer shown in table 3 which also reveal that patients with breast cancer had lower level of serum free PSA postoperatively than preoperatively that is also statistically significant.

Table.1 Show age distribution of patients with breast benign and malignant disease

Age in years	No. of patients with Breast cancers (%)	No. of patients with Fibroadenoma (%)	Total
15 - 40	27 (37.5%)	54 (90%)	81
>40	45 (62.5%)	6 (10%)	51
Total	72	60	132

Table.2 Show the assessment of serum free PSA level before and after surgery for patients with breast fibroadenoma

Assessment	Mean	No. of patients	Std. error
Preoperative PSA	3.1	60	0.3
Postoperative PSA	0.9	60	0.1

P –value =< 0.005 is significant

Table.3 Show the assessment of serum PSA level before and after surgery for patients with breast cancer

Assessment	Mean	No. of patients	Std. error
Preoperative PSA	2.1	72	0.3
Postoperative PSA	1	72	0.1

P –value =< 0.005 is significant

Prostate-specific antigen (PSA) is a useful serum tumor marker for screening, diagnosis, and monitoring of patients with prostatic carcinoma (Oesterling, 1991). In prostatic carcinoma, the greater fraction of PSA is in its complex form (Lilja *et al.*, 1991).

Current studies are made to identify useful serological tumour marker for breast carcinoma (Devine *et al.*, 1995; Eskelinen *et al.*, 1997; Heinze *et al.*, 1997). This study show that free PSA was presented in a significant level in the serum of patients with both benign and malignant breast mass. However the serum levels of free PSA were

higher in patients with fibroadenoma than its level in breast carcinoma patients.

This study reveals that the level of serum free PSA decrease after surgery for patients with breast cancer that is statistically significant. This finding is comparable to the result obtained by Margot *et al.* (2000) study which found that serum free PSA level decreases more dramatically after surgery for patients with breast cancer, which strongly indicating that free serum PSA is produced by the breast tumor. Also other studies noted that most breast tumors PSA present in its free form (Diamandis *et al.*, 1994; Gai *et al.*, 1995; Melegos and

Diamandis, 1996). It is reported that serum free PSA is highly specific for breast cancer (Margot *et al.*, 2000). So serum free PSA can be useful serological tumor marker for patients with breast cancer. Previous studies demonstrate that PSA stimulate uncontrolled proliferation in osteoblast and fibroblast cell lines (Killian *et al.*, 1993). Also it is reported that PSA may aid tumor progression or spread because it induce cell detachment (Webber *et al.*, 1995).

In a large Borchert study, it was confirmed that the predominate form of PSA in normal or hirsute woman is PSA –ACT (antichymotrypsin) complex form while its free form is the major one in patients with malignant or benign disease (Borchert *et al.*, 1997). Some studies reported that PSA positivity in breast cancer is a good prognostic factor because its positivity is associated with small size tumors and positive hormonal receptor status (Black and Diamandis, 2000; Yu *et al.*, 1998; Parish, 1998). Therefore its positivity is associated with good response to hormonal therapy.

However the results of other studies did not regard PSA positivity as a prognostic tumor marker in breast carcinoma (Alanen *et al.*, 1999; Griniatsos *et al.*, 1998). In contrast, PSA positivity may have unfavorable prognosis in estrogen receptor breast cancer. So PSA positivity and its potential role as prognostic tumor marker in breast carcinoma are still controversial. It has been suggested that the presence of circulating serum free PSA rather than bound PSA in women could be used as a diagnostic test for patients with high risk of subsequent breast cancer.

Conclusion

Serum free PSA can be used as serological tumor marker in the diagnosis and follow up

of patients with breast benign and malignant diseases.

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