

## **Dedication**

*To my dear parents*

*Who offered me everything*

*Without taking anything*

*To my beloved one*

*My husband*

*Mohammed Saeed*

*My daughter*

*Najwan*

*To my family*

*To my teachers & colleagues*

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## **Abstract**

A descriptive, case-control study conducted in Radiation isotopes center - Khartoum, during the period from May to October 2008, the study group were obtained from those living in Khartoum state.

Analytical and statistical methods were applied to estimate the levels of Creatine kinase and Lactate dehydrogenase enzymes in women with breast cancer under different types of treatment including mastectomy, chemotherapy, and radiotherapy.

A total of (63) women – both case and control subjects – were studied, their ages were between 35 to 65 years, in which (33) women were the test subjects, including (11) with mastectomy, (11) receiving chemotherapy, and (11) with radiotherapy. 30 healthy women were the control subjects, and their ages were between 35 to 65 years.

Blood samples from each subject were taken, serum specimens were analyzed spectrophotometrically for CK and LDH activities. The results were statistically analyzed.

The results obtained showed that, there was insignificant difference between the means of serum CK levels, among the test group compared to the control group, with a P value of 0.252, and a high significant difference between the means of serum LDH activity, among the test group compared to the control group with a P value of 0.000.

The ANOVA test results showed that, there was insignificant difference between the means of serum CK levels with a P value of 0.406, 0.847 and 0.569 among the test groups mastectomy, chemotherapy, and radiotherapy respectively compared to the control group, and no increase in enzyme level.

The test also showed that, there was significant difference between the means of serum LDH activity, among the mastectomy, chemotherapy, and radiotherapy groups with a P value of 0.019, 0.002 and 0.004 compared to the control group.

This study concluded that, in women with breast cancer under treatment, the level of total CK was normal because the enzyme predominates mainly in muscle tissues and breast contain adipose tissues, but there was an increase in LDH level, and this attributable to anaerobic glycolysis in cancer cells.

## الخلاصة

أجريت هذه الدراسة الوصفية في السودان في مركز الخرطوم للعلاج بالذرة خلال الفترة ما بين مايو- اكتوبر 2008م، تم اخذ العينات من مرضى سودانيين من ولايات مختلفة يقيمون بالخرطوم.

أستخدمت طرق تحليلية وأحصائية لقياس انزيم الكريتين كاينيزواللاكتيت دى هايدورجينيز لدى النساء المصابات بسرطان الثدي وتحت انماط علاج مختلفة مثل ازالة الثدي والعلاج الكيميائى والعلاج بالاشعة.

عدد 63 امرأة يمثلون الفئة المستهدفة والفئة الضابطة تمت دراستهم ، كانوا عبارة عن 30 امرأة يمثلون الفئة الضابطة و 33 امرأة يمثلون الفئة المستهدفة تتراوح اعمارهن بين 35 الى 65 سنة، 11 من هذه الفئة تمت لهن ازالة الثدي و 11 امرأة يتلقين العلاج الكيميائى و 11 امرأة يتلقين العلاج بالاشعة.

تم أخذ عينات الدم وحللت العينات باستخدام جهاز قياس الطيف اللوني لقياس انزيم الكريتين كاينيز واللاكتيت دى هايدروجينيز، ثم حللت النتائج إحصائياً.

أوضحت النتائج أنه لا يوجد إختلاف معنوي ذو دلالة إحصائية في متوسطات الكريتين كاينيز بين الفئة المستهدفة والفئة الضابطة بقيمة احتمالية (0.252) بينما يوجد إختلاف معنوي كبير ذو دلالة إحصائية في متوسطات اللاكتيت دى هايدروجينيز بين الفئة المستهدفة والفئة الضابطة بقيمة احتمالية (0.000).

أظهر التحليل الاحصائي أنه ليس هناك إختلاف معنوي ذو دلالة إحصائية في متوسطات الكرياتنين كينيز بين النساء اللاتى اجريت لهن عملية ازالة الثدي واللاتى ياخذن علاج كيميائى وفى حالة العلاج بالاشعة عند الم مقارنة بالفئة الضابطة. كما أوضح التحليل أن هناك إختلاف معنوي ذو دلالة إحصائية في متوسطات اللاكتيت دى هايدروجينيز بين النساء اللاتى اجريت لهن عملية ازالة الثدي واللاتى ياخذن علاج كيميائى وفى حالة العلاج بالاشعة عند الم مقارنة بالفئة الضابطة.

خلصت الدراسة إلى أن سرطان الثدي وعلاجه لا يصحبهما ارتفاع في مستوى  
انزيم الكرياتين كينيز لانه يتركز في خلايا العضلات بينما يرتفع مستوى انزيم اللاكتيت  
دي هايدروجينيز الناتج من عملية تحليل الجلوكوز اللاهوائية في الخلايا السرطانية  
وربما يكون دليلا على عدم موتها.

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## List of Abbreviations

| Abbreviation | Word                                   |
|--------------|--|
| ADP          | Adenosin Di Phosphate                  |
| ATM          | Ataxia Telangict mutated               |
| ATP          | Adenosin Tri Phosphate                 |
| CA           | Carbohydrate antigen                   |
| CEA          | Carcino Embryonic antigen              |
| Ck           | Creatine Kinase                        |
| DCIS         | Ductal Carcinoma Insitu                |
| DNA          | Deoxy Nucleotide Neuclic acid          |
| FNA          | Fine needle Aspiration                 |
| HER          | Human epidermal growth factor receptor |
| LDH          | Lactate Dehydrogenase                  |
| HK           | Hixo kinase                            |
| G6P          | Glucose six phosphate                  |
| RIA          | Radio Immuno Assay                     |
| MRI          | Magnetic Reasonce Imagine              |
| BRCA         | Breast Cancer antigen                  |
| LCIS         | Lobular Carcinoma Insitu               |