

## **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 كاينيز واللاكتيت دى هايدروجينيز لدى النساء المصابات بسرطان الثدي وتحت انماط علاج مختلفة مثل ازالة الثدي والعلاج الكيميائي والعلاج بالأشعة.

عدد 63 امراة يمثلون الفئة المستهدفة والفئة الضابطة تمت دراستهم ، كانوا عبارة عن 30 امراة يمثلون الفئة الضابطة و 33 امراة يمثلون الفئة المستهدفة تتراوح اعمارهن بين 35 الى 65 سنة، 11 من هذه الفئة تمت لهن ازالة الثدي و 11 امراة يتلقن العلاج الكيميائي و 11 امراة يتلقن العلاج بالأشعة.

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

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 الكرياتين كينيز بين النساء اللاتي اجريت لهن عملية ازالة الثدي واللاتي يأخذن علاج كيميائي وفي حالة العلاج بالأشعة عند المقارنة بالفئة الضابطة. كما أوضح التحليل أن هناك إختلاف معنوي ذو دلالة إحصائية في متوسطات اللاكتيت دى هايدروجينيز بين النساء اللاتي اجريت لهن عملية ازالة الثدي واللاتي يأخذن علاج كيميائي وفي حالة العلاج بالأشعة عند المقارنة بالفئة الضابطة.

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

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## List of Abbreviations

<b>Abbreviation</b>	<b>Word</b>
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