

# Identifying the Correlation between the Incidence of Breast Cancer and Hepatitis B Virus of Iraqi Women

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## Abstract

**Objective:** Women are half of the Iraqi community and their health should be priority to the country. Breast cancer Occurs is increasingly rising in Iraq due to so many problems that the country has suffered. Several previous studies have studied breast cancer; however, none of them has explore the presence of HBV and the basic molecular mechanism are generally obscure and research studies are not enough and disintegrated.

**Method:** Therefore, this study are focusing on discovering a novel technique to detect breast cancer as early as possible to kept women lives. Advancement in routine breast cancer risk assessment will prevent chemotherapy uptake in women. subsequently , the women with or without breast tumor have expose to plasma assay to reveal HBV, Estrogen, Progesterone, complete blood count . The women test are divided into many classes of such as age , smoke and non-smoke to test their ability to detoxify carcinogenic aromatic amines in cigarette smoke.

**Result:** 64% of the malignant women were smoker while 36% were none smoker.  $45\pm 12$  years is the most vulnerable age to get cancer. HBsAg were demonstrated in 10% of the all malignant ladies, while anti-HBs Ag have detected in only 5 % of the total number. ,complete blood counts and hormonal levels were dysregulated in the breast cancer patients.

**Conclusion:** The hormones are negatively correlated with the presence of cancer, HBV have detected in several samples but the no significant correlation. Smoking is the most factor significantly associated with breast tumor . For all these reasons .Iraqi government strongly argue to make smoking cigarettes prohibited in public areas.

**Keywords:** *breast cancer, progesterone, estrogen, HBV, smoking*

## Introduction

International Agency for research cancer (IARC) has reported that female breast cancer is responsible about 11.6% of total cancer incidence, and documented to be a common diagnosed cancer and ranked as number one leading death for women worldwide<sup>(1)</sup>. . Fortunately, breast cancer is highly curable if diagnosed at earlier stage, but it might be deadlier if discover at later stages<sup>(2)</sup>. <sup>2</sup>. Breast cancer (BC) is a heterogeneous illness e ranked as the highest happening of all females cancer types and number leading death worldwide<sup>(3)</sup>. In 2015, 143 cases were registered as positive breast cancer in Thi-Qar represented by 11.7% off all cancer cases registered in the city. In Asia, and particularly in the Middle East there is a rising incidence of breast cancer even though they migrate to western countries years ago<sup>(4)</sup>. Contrary

to the latest drop in the breast cancer occurrence in Western nations in comparison the occurrence in Iraq has been increasingly rising. The estimated number of Iraq's population in 2015 is 36,933,714 included 18,659,573 males and 18,274,141 females (Ministry of planning / Central Statistic Organization). The number of breast cancer in Iraq which is 3763 cases in 2011 as it recorded in the cancer registry data published by the Iraqi cancer board, has reached a scary number in 2015 so breast cancer raised to be second female mortal cancer in Iraq. These documents ring the bell for imminent step towards understanding the epidemiology and the reason that underline the breast cancer predisposition. The expanded rate of the this kind of sickness could be due to other trends such as lower parity, postponed childbirth, declined breast feeding, war, terrorist that reduce the

health care services and sedentary lifestyle. The survival average of breast tumor are determined by the stage of diagnosis, therefore, there is increasing occurrence of breast cancer doom for women living in the rural in comparison to women living in the urban area .

There were no obvious examples of expanded hazard related with smoking by N-Acetyltransferase 2 (NAT2) state among premenopausal ladies. In postmenopausal ladies, who are slow acetylators, NAT2 strongly changed the relationship of smoking with breast cancer risk<sup>(5)</sup>.<sup>5</sup>. These data strongly support this hypothesis that discovering and detoxifying carcinogens accumulated in the body from environment might reduce the breast cancer mortality rate.

On the other hand, genetics variations are an earlier signs of breast cancer such as P53, , ZHX1, 2 and 3 genes<sup>(6,7)</sup>. .NAT1 and NAT2<sup>(8)</sup> the major decrease in breast malignant growth has managed by a full term pregnancy recommends the extraordinary capability of preventive hormonal procedures. As opposed to the dangers related with delayed exposures, exogenous estrogen and progesterone for brief terms can copy the defensive impacts of pregnancy in cancer-causing agent actuated mammary tumor models<sup>(9)</sup>. .

About 300 million individuals worldwide affirmed positive for Hepatitis B infection (HBV) as well as it is a basic cause of hepatic disease and hepatocellular carcinoma. HBV is an individual from the Hepadnaviridae family that incorporates A, C, D, E. HBV is a little DNA infection with uncommon characters practically identical to retroviruses and delegated Orthohepadnavirus family has a size 3.2 DsDNA genome that is secured by HBsAg. The clinical significance of the infection originates from its capacity to cause unending illness and being oncogenic. HBV reiterate by means of RNA moderate and can incorporate into the host genome. The special portrayals of the HBV replication cycle present a particular capacity of the infection to endure in infected cells. serological parameters and sub-atomic examines have been improved for the identification of various sorts of HBV connected malady and for relieving of endless hepatitis B contamination. HBV contamination is a noteworthy motivation to a wide range of liver sickness .The hepatic injuries a

Are ranging from intense such as counting fulminant hepatic disappointment to constant hepatitis, cirrhosis, and hepatocellular carcinoma<sup>(10)</sup>.<sup>10</sup>. Intense

HBV was contaminated human could be superbly fine or show side effect of intense hepatitis. Most adults polluted with the infection recover, while 5%– 10% are unfit to clear the inflammation and become endlessly diseased. Numerous incessantly tainted people have mild liver sickness with practically no morbidity or mortality. Other individuals with chronic HBV infection may continue to compelling illness, which can continue to cirrhosis and liver malignant growth. These patient's supplication demanding observing and remedial mediation. Extra hepatic indications of HBV disease are uncommon yet can be hard to identify and treatment. The challenges in the field of HBV illness are the poor instruments in anticipating result and movement of HBV disease and the stubborn need to comprehend the cell, immunological, furthermore, acquired premise of different ailment displays related with HBV disease<sup>(11)</sup>.

## Material and Method

### Samples:

150 women have involved in the study from the main teaching hospital in Thi-qar province, 100 specimens were clinically and histopathology examined and reported to have malignant breast cancer approved via clinical examination, mammographic screening, breast ultrasound, breast magnetic resonance imaging (MRI). our study has included women have suffered breast shaping alteration characterized by the presence of hard, fixed, breast lumps and/or swollen breast of one or both sides. one-sided nipple ejection mainly bloody discharge with or without palpable lump are the chief signs of women included in my study. As the age is being the main risk factor, the patients were divided into age groups.

On the other hand, this study have involved 50 ladies were undergone breast biopsy taken, but the oncologist has reported them to be either having benign tumor or none at all so them have used as a control group. Smoking mean the lady is a smoker or live with a partner who is a smoker, non-smoking means the lady is neither she or her household smoke.

### Serological tests by ELISA:

Hepatitis B infection is the most hideous kind of hepatitis; hence, I centered my examination on the estimations of hepatitis B infection antibodies and antigens in the patient's blood . To determine the period of illness whether it is intense or ceaseless; for

all patients; it utilized HBs Ag to identify the hepatitis Ag altogether, followed by testing HBc to determine the antibodies for the center antigen for all cases by ELISA (Bioprobes - Italy). Biochemical tests were utilized to distinguish the liver protein ALT Alanine transferase (GPT) to measure the hepatic cell damage.

**physiological parameters :** These investigation have included complete blood count has been done for all the samples as well as hormonal measurements have been done by collecting the blood from the patients in the middle of their menstrual cycle. Minividus device has been used to measure the hormones.

**Statistical analysis:**

GraphPad crystal variant 7 programming for Windows, La Jolla California USA, www.graphpad.com, it was utilized to average and plot the information in this project with standard deviation. Although performing t-test between two groups, crystal was utilized ANOVA to break down at least three bunches pursued by numerous correlations utilizing Tukey’s test. Significant information designed by star as the following:  $0.01 \leq *p < 0.05$ ;  $0.001 \leq **p < 0.01$ ;  $***p < 0.001$ .

**Results**

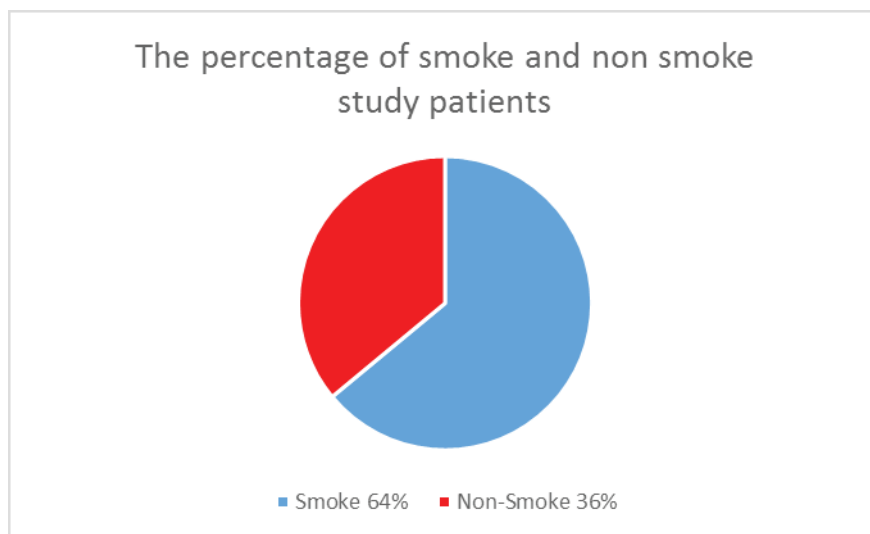
The 100 ladies were malignant were divided into 64% to be smoke that term include an active or second-hand smoke . If the woman is an active smoke means her is the person who smoke or live in the smoking house or work at smoking environment, while 36% were not smoking women (Figure 1). The incidence of the disease where around the age of  $45 \pm 12$  to be the significant age to have malignant disease (Table1).

Only 10% have shown positive HBs Ag, while 90% were negative (Figure 2). On the other hand, there were 5% of the breast cancer ladies shown positive Anti-HBc antibodies while 95% were negative.

Complete blood count was normal for control group and low for the cancer group including WBC, RBC, Platelets (data not shown). Hormone test has shown normal level Progesterone for the normal group, it was around 5-20 ng/ml, while normal estrogen was 15-350 pg/dl for the pre-menopausal women and 10 pg/dl for the post-menopausal ladies (Table 2).

**Table1: The link between the presence or absence of tumor with Ag, HBV and smoking state.**

Parameters	Benign tumor N 50	Cancer 100	P value
Age	$50 \pm 10$	$45 \pm 12$	$< 0.005$
HBV Positive	5	18	Not significant
HBV Negative	45	82	Not significant



**Figure 1: Breast cancer patients classified into smoke and non-smoke categories.**

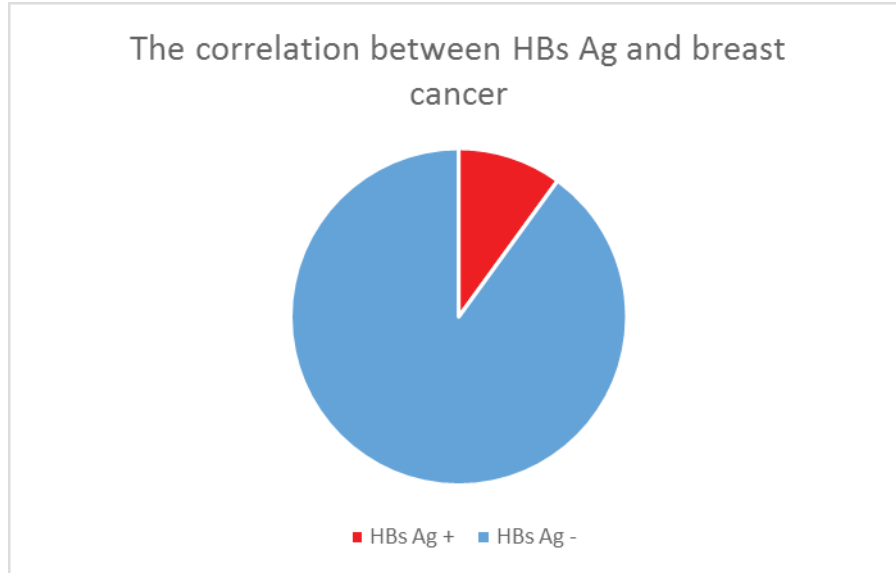


Figure 2: The correlation between HBs Ag and breast cancer

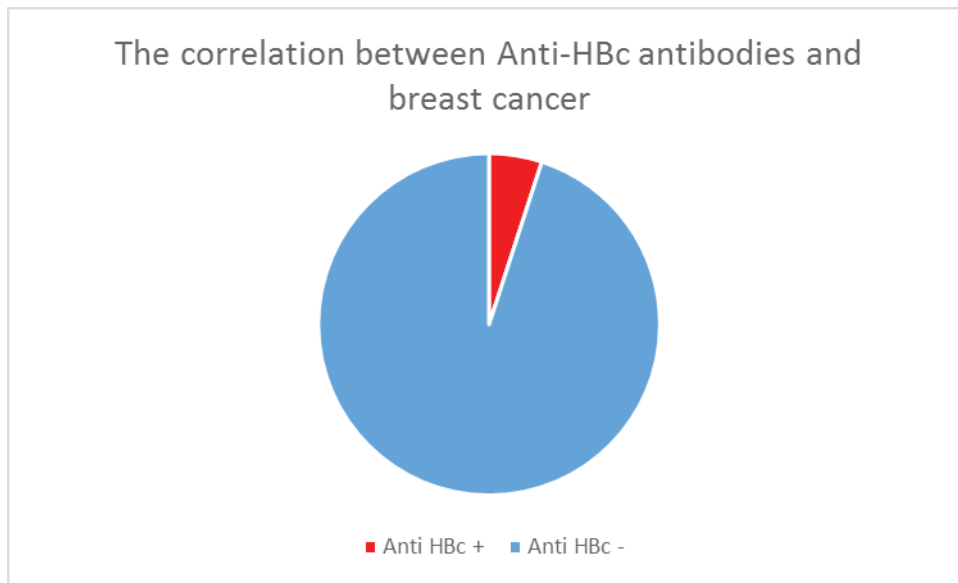


Figure 3: The correlation between Anti-HBc antibodies and breast cancer

Table 2: Hormones test were performed to the patients in the projects

Patients samples	Pre-menopausal	Post-menopausal
Progesterone	15±5 ng/dl 60%	0.3-1 ng/dl 39% 15.0 ng/dl 1%
Estrogen	200± 15 pg/dl 60%	10 pg/dl 30% 150 pg/dl 10%

## Discussion

The estimated number of Iraqi populations is 2,029,345 in Thi-qar Province and 7,877,888 in Baghdad city .

**My project will significantly contribute to science** since it examined the alteration with the presence or absence of breast cancer and link this alteration to the environment whether it is smoking or not smoking area. I presume detecting a dose response correlation between the number of cigarettes smoked and the breast cancer risk but unfortunately, it could not measure the correlation in the present project.

The full epidemiological features of breast cancer in Iraqi women are not yet fully understood. My project is novel since it aims to discover a novel method that could detect breast cancer.

There was a significant correlation between the smoked life style and the breast cancer incidence. The results are consistent with several research across the world <sup>(5,8)</sup> 5, who found that there is a link between the carcinogenic materials in the cigarettes. In my opinion, carcinogenic materials can dispose in the human body. Then, with recurrent exposure, DNA mutation might occur and could be followed by second hit mutation to end up forming malignant mortal cancer.

Hepatitis B disease is prevalent in Iraq. So, the result 10% and 5% only infected patients were surprising since it expected more due to the epidemic virus infection. These data could be explained with the low number of patients so 100 patients is not enough to get the epidemiological study. The present study has recommend to use 500-1000 cases across the 17 provinces of the country to do a reliable research enough to get scientifically meaningful conclusion.

This study has done a case-control project and compared WBC, RBC counts between patients with breast cancer and tendency score-matched controls. Laboratory test has been examined such as complete blood count, the complete blood count WBC were in normal range from 3,700 to 10,500 for the healthy control group and a decreased WBC count in women could have undiagnosed breast cancer or may be due to chemotherapy for individuals already have cancer. It could be low due to a viral infection, a toxic reaction, or a process in the bone marrow that restrictions the body's ability to create normal WBCs.

Hormonal tests have shown a high level of progesterone and Estrogen for pre-menopausal in women under 50 years old are expected. On the other hand, women older than 50 years or post-menopausal have expressed lower hormonal levels and was expected as it the normal physiology of the women body (Table 2).

Few cases have shown normal hormonal levels, after investigation, it appears that their doctor has prescribed medical hormones treatment which play principal roles in coordinating suitable growth and function of breast tissue. High levels of these hormones are correlated with pregnancy and seem to be responsible for the weakened risk for breast cancer among women following a full-term pregnancy. The patients samples are classified as stage I or stage II when the tumor size is  $\leq 4$ cm according to<sup>(11)</sup> .

This current study may be assesst of the samples by smoke/non-smoke, ER/PR status, menopausal status, and body mass index (M. Al-Kafajy unpublished data) and weighed the association between WBC, RBC count, genetic expression and breast cancer encumbrance using multinomial logistic regression.

The work was aimed to set standards of breast cancer risk prognostication by analysis the alteration of gene expression and particularly spotted the specific genomics aberration in Iraqi women such as BRCA1, BRCA2, HER2/ neuoncogene, progesterone and estrogen receptors, P53, ZHX1, 2 and 3 genes. Genetic alteration in P53 is not expected except in the ladies who have cancer since it is the guardian of the cell. Alteration in P53 will be anticipated in the samples that already have cancer. ZHX1, ZHX2 and ZHX3 could be altered in the expression or protein concentration or localization <sup>(12)</sup> 12. Potential application for the project will be forcing a healthy habit for the individual and set laws that protect second hands smokers from the carelessness of most of the smokers.

## Future Direction

our study like to expand present project to examine the smoking duration and its ongoing change in the physiological and genetic level as it already have been done in the western countries and found a modest relationship in the pre and post-menopausal women <sup>(8)</sup> 8. Our team would like to expand my project to include women from areas know to be contaminated such as factory region in Baghdad which is known to

be environmentally bad area to live in. On the other hand, the area that were under terrorist occupation has contaminated with war products and probably the women they don't have access to suitable health care. Moreover, the refugee camps in the Kurdistan area would be another spot that could be included in the study since the poverty rate and hard circumstance in this area make it really difficult to have a good health care system.

**Ethical Clearance:** The Research Ethical Committee at scientific research by ethical approval of both environmental and health and higher education and scientific research ministries in Iraq

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Funding:** Self-funding

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