

# Statistical Study of Cancer in Diyala Provenance

Salam Hasoon Mohammad (FIBMS)<sup>1</sup>, Ruaa A Salman (HD)<sup>2</sup>  
<sup>1,2</sup> Baquba Teaching Hospital- Diyala- Iraq

## Abstract

### OPEN ACCESS

**Correspondence Address:** Salam Hasoon Mohammad  
Baquba Teaching Hospital- Diyala- Iraq

**Email:** [Salam.Hasoon@yahoo.com](mailto:Salam.Hasoon@yahoo.com)

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**Website:** <https://djm.uodiyala.edu.iq/index.php/djm>

**Received:** 10 May 2022

**Accepted:** 14 August 2022

**Published:** 15 October 2022

**Background:** Malignant neoplasms are a group of illnesses involving altered cell proliferation with the ability to invade or metastasize to other sites of the body. Not all neoplasms are malignant; benign neoplasms do not metastasize to other parts of the body.

**Objective:** To find out and subcategorize different types of malignant neoplasms in the Diyala and find the relationship with different criteria, including age, sex, grade....,etc.

**Patients and Methods:** In order to conduct this retrospective study, 158 patients with malignant neoplasms were chosen from the pathology laboratories spread throughout Provenance-Baquba City between February 2012 and December 2016. For all cases, we do statistical analysis for age, gender, tissue affected, type of surgery, kind of malignant neoplasm, grade, stage, and history of diagnosis and find the relationship of each of these factors with each other.

**Results:** The highest kind of malignant neoplasm within the study was mammary carcinoma, which comprised 39 (24.9%); then dermal malignant neoplasm was 30 (18.9%); and malignant lymphoma was 12 (7.8%); the rest of the other 76 are other malignant neoplasms (48.4%).

**Conclusion:** Mammary carcinoma is the most common malignant neoplasm in the Diyala Region (25 %), followed by dermal carcinoma (19%), and malignant lymphoma (8 %). Age (51–60 years) is a risk factor for malignant neoplasms in the Diyala Region.

**Keywords:** Cancer, Diyala Provenance, Mammary carcinoma

## Introduction

Malignant neoplasms are a collection of illnesses including altered cell proliferation with the capacity to invade or metastasize to other sites of the patient's organs [1,2]. Not all neoplasms are malignant; benign neoplasms do not metastasize to other sites of the body [2]. Clinical manifestations consist of a mass, hemorrhage, shortness of breath, decreased body weight, and diarrhea or constipation [3]. In spite of the fact that these manifestations may indicate malignant neoplasms, they might be due to other reasons.[3] More than a hundred types of malignant neoplasms attack people [2].

Cigarette smoking is responsible for 22 % of malignant neoplasms mortality [1]. 10 % is due to overweight, malnutrition, poor exercise, and alcoholism.[1-4] 5 to 10 % of malignant neoplasms are related to a family history of cancer [7]. Many cancers can be prevented by not smoking, maintaining a healthy weight, not drinking alcohol, eating plenty of vegetables, fruits, and whole grains, vaccination against certain infectious diseases, not eating too much processed and red meat, and avoiding too much sunlight exposure [9,10].

To find and subcategorize different types of malignant neoplasms in the Diyala region and find the relationship between them with different criteria, including age, sex, grade, and stage of cancer.

### Patients and Methods

In order to conduct this retrospective study, 158 patients with malignant neoplasms were chosen from the pathology laboratories spread throughout Provenance-Baquba City between February 2012 and December 2016. For all cases, we do statistical analysis for age, gender, tissue affected, type of surgery,

kind of malignant neoplasm, grade, stage, and history of diagnosis and find the relationship of each of these factors with each other. For grading the mammary carcinoma cases, we used the Nottingham Modification of the Bloom-Richardson Grading system.

### Statistical Analysis

The data was entered and analyzed using Microsoft Excel 2010 software for Windows 10. Descriptive statistics were presented as mean ± standard deviation (SD) for continuous variables and as frequencies and proportions (%) for categorical variables.

**Table (2):** Shows the t-test of the study variables

|                | T      | Df  | Sig.(3-tailed) | Mean Difference |
|----------------|--------|-----|----------------|-----------------|
| <b>Age</b>     | 39.663 | 157 | .000           | 53.49367        |
| <b>Sex</b>     | 35.563 | 157 | .000           | 1.29747         |
| <b>surgery</b> | 17.992 | 157 | .000           | 8.18354         |
| <b>Type</b>    | 21.179 | 157 | .000           | 24.80380        |
| <b>Gr</b>      | 29.619 | 71  | .000           | 2.25000         |
| <b>St</b>      | 12.120 | 20  | .000           | 2.76190         |

\*Note from Table (1) that all the variables of the study were p-value of (0.000) smaller than the value of  $\alpha$  (0.05) compared to their mean. This indicates that all variables have a significant effect on the study

### Results

158 patients with variable kinds of malignant neoplasms in variable sectors in the Diyala Region were put to statistical analysis, including age, gender, grade, and stage of cancer, seeking for the more frequent types of malignant neoplasms found in this study.

We note that breast cancer constitutes about 25 % of total cancer cases; skin cancer about

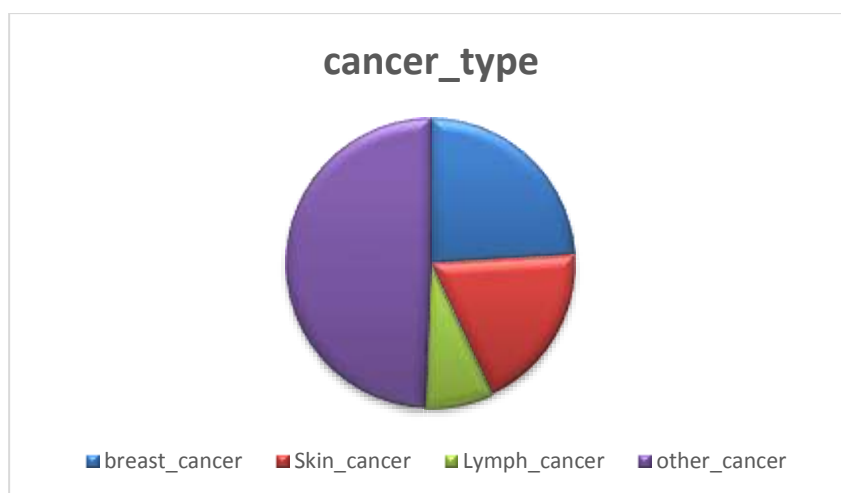
20 %; malignant lymphoma constitutes about 8 % and the rest of the other cancer types about 50%. We note most breast cancer cases were in the intermediate grade (Grade II), while skin cancer cases were in the low grade (Grade I). The Nottingham grading system is used for grading breast cancer. Also, we note that grade III is the most frequent grade among all types of cancers (45%).

**Table (2):** The types of malignant neoplasm for variable age categories

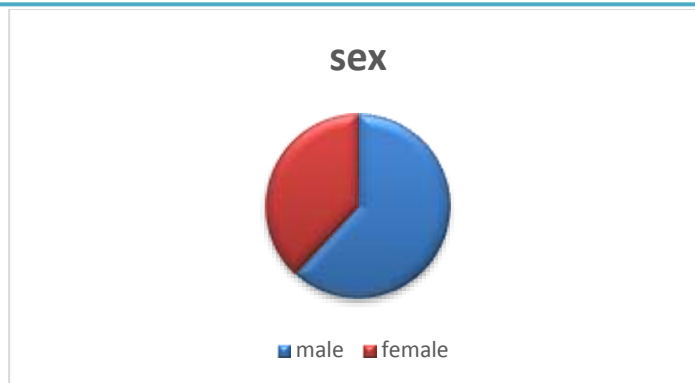
| Kind of malignant neoplasm   | Number of patients | (31-40) |      | (41-50) |      | (51-60) |       | (> 60) |     | Total |      |
|--|--------------------|---------|------|---------|------|---------|-------|--------|-----|-------|------|
|  |                    | No.     | %    | No.     | %    | No.     | %     | No.    | %   | No.   | %    |
| 1.Mammary CA   | 39                 | 7       | 18   | 12      | 31   | 13      | 33    | 7      | 18  | 39    | 24.9 |
| 2.Dermal CA  | 30                 | 2       | 7    | 2       | 7    | 11      | 36    | 15     | 50  | 30    | 18.9 |
| 3.Malignant Lymphoma.  | 12                 | 5       | 41   | 2       | 17   | 2       | 17    | 3      | 25  | 12    | 7.8  |
| 4. other malignant neoplasms (CA Lung, urinary bladder, brain, uterus, ovary..etc) | 76                 | 10      | 13.2 | 18      | 22.4 | 30      | 39.4  | 19     | 25  | 76    | 48.4 |
| All  | 158                | 24      | 79.2 | 34      | 72.4 | 56      | 125.4 | 44     | 118 | 158   | 100  |

Recognize from table (2) that the most common kind of malignant neoplasm in this study is mammary carcinoma with a percentage of 24.9%, followed by dermal carcinoma with a percentage of 18.9% and malignant lymphoma with a percentage of 7.8%; the rest of the patients have other kinds of malignant neoplasms (CA lung, urinary bladder, brain, uterus, ovary., etc.) with a percentage of 48.4%. Regarding mammary carcinoma, which had the largest

number of patients (38), most of the cases fell into the age group of 51-60 years, and all were females. Dermal carcinoma mainly affects patients over 50 years of age. Malignant lymphoma affects the age group (31-40) mainly. The rest of the malignant neoplasms affect people over 40 years of age mainly. As illustrated in the underlying figure:



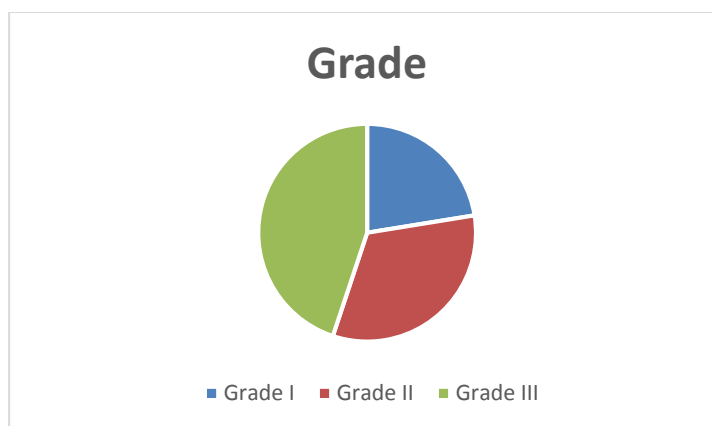
**Figure (1):** Show the rates of variable malignant neoplasms kinds



**Figure(2):** Male to Female Ratio for total cancer types

**Table(3):**Correlation between the frequencies of the different histological grades and the different types of cancer

| Types of Cancer   | No. of cases | Grade I   |           | Grade II  |           | Grade III |           |
|---|--------------|-----------|-----------|-----------|-----------|-----------|-----------|
|   |              | No.       | %         | No.       | %         | No.       | %         |
| Breast Cancer   | 22           | 0         | 0         | 14        | 64        | 8         | 36        |
| Skin Cancer   | 5            | 3         | 60        | 1         | 20        | 1         | 20        |
| Lymph Node  | 2            | 0         | 0         | 1         | 50        | 1         | 50        |
| Other cancer (CA lung, urinary bladder, brain, uterus, ovary..etc | 41           | 8         | 19.5      | 21        | 51.2      | 12        | 29.3      |
| <b>Total</b>  | <b>70</b>    | <b>11</b> | <b>22</b> | <b>37</b> | <b>33</b> | <b>22</b> | <b>45</b> |



**Figure(3):** Illustrating the percentages of different histological grades for all cancer types

**Table(4):** Shows the significance of age in comparison with the Grade of cancer

| Gr                    |                |    |             |       |      |
|-----------------------|----------------|----|-------------|-------|------|
|                       | Sum of Squares | df | Mean Square | F     | Sig. |
| <b>Between Groups</b> | 16.117         | 29 | .556        | 1.744 | .049 |
| <b>Within Groups</b>  | 13.383         | 42 | .319        |       |      |
| <b>Total</b>          | 29.500         | 71 |             |       |      |

\* Note from Table (4) that the value of p-value (0.049) is smaller than the value of  $\alpha$  (0.05). This indicates that age has a significant effect on Gr in Diyala Provenance

**Table(5):** Shows the significance of age compared to the Stage of cancer

| St                    |                |    |             |       |      |
|-----------------------|----------------|----|-------------|-------|------|
|                       | Sum of Squares | df | Mean Square | F     | Sig. |
| <b>Between Groups</b> | 17.976         | 11 | 1.634       | 3.837 | .027 |
| <b>Within Groups</b>  | 3.833          | 9  | .426        |       |      |
| <b>Total</b>          | 21.810         | 20 |             |       |      |

\* Note from Table (5) that the value of p-value (0.027) is smaller than the value of  $\alpha$  (0.05). This indicates that age has a significant effect on St in Diyala Provenance

## Discussion

In this retrospective study, we performed statistical analysis for malignant neoplasm cases that took into account various factors, including age, gender, kind of malignant neoplasm, grade, and stage. We found that mammary carcinoma is the most frequent malignant neoplasm type in the Diyala Region (25 %), followed by dermal carcinoma (19%), and malignant lymphoma (8 %). These results are comparable to those from Roswell in 1998 and Alpharetta in 2004.

The percentage of all other malignant neoplasms is (48%). Because the majority of patients seek treatment outside of our region, we find that pulmonary carcinoma patients are only slightly different from those from other parts of our country. The prostate, colon, and ovary are mentioned in a similar way.

For mammary carcinoma, we recognize that most of the cancers happen in the forties and fifties, and the mean age is fifty. These outcomes are comparable to those from Alpharetta 2004 and Roswell 1998. According to Table 1, dermal cancer is most common in people in their fifties and sixties, with a mean age of sixty-three. Malignant lymphoma is frequent in the thirties and the average age is forty-one. The average age for all other types of neoplasms is fifty-three, as shown in Table (1), and they tend to occur

more frequently in people in their fifties. This result is comparable to the results from Qadir (2005), who found that cancer is more frequent in the first six decades of life.

Therefore, as shown in Table (1), age is directly correlated with the development of cancer in the Diyala Provenance. According to Tables (3) and (4), age also has a significant impact on the grade and stage of cancer (which are directly related). Figure (2) illustrates the 1.6/1 male to female ratio.

These results are comparable to results from Roswell in 1998 and Alpharetta in 2004. Grade II is more prevalent in breast cancer (64%) than Grade I is in skin cancer (60%) and Grade II and III are equally prevalent in lymph node cancer (50%) according to histological grade. Grade II is the most frequently diagnosed in cases of other cancers (51%). These results are comparable to results from Roswell and Alpharetta; they found that Grade II was the most common grade of cancer in these two studies. For all cancer types, we find that Grade III is the most common (45%), as shown in Figure (3).

## Conclusions

Breast cancer is the most frequent cancer in Diyala Provenance (25 %) followed by skin cancer (19 %). In the Diyala Provenance, age is a risk factor for the development of cancer.

## Recommendations

A larger study of more cancer cases that diagnosed in all Diyala health sectors to gain

more accurate look on the cancer cases in this provenance.

Promote surgeon – histopathologist team work action in order to not let cancer cases flee outside this region and therefore we can survey them more clearly.

**Source of funding:** The current study was funded by our charges with no any other funding sources elsewhere.

**Ethical clearance:** Ethical approval was obtained from the College of Medicine / University of Diyala ethical committee for this study.

**Conflict of interest:** Nil

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## دراسة احصائية للأورام السرطانية في محافظة ديالى

د.سلام حسون محمد<sup>١</sup> ، رؤى عبد الكريم سلمان<sup>٢</sup>

### المخلص

**خلفية الدراسة:** الأورام السرطانية هي مجموعة من الأمراض الخبيثة تتميز بنمو غير طبيعي لخلايا الجسم والقابلية لتغزو الأنسجة موضعية والانتشار لبقية أجزاء جسم الإنسان. ليس كل الأورام هي خبيثة فهناك الأورام الحميدة التي ليس لها القابلية للغزو الموضعي أو الانتشار.

**اهداف الدراسة:** لدراسة وتصنيف الأنواع المختلفة للأورام السرطانية في محافظة ديالى ودراسة العلاقة بين السرطان و مختلف العوامل المؤثرة عليه كالعمر والجنس ودرجة السرطان ومرحلته.

**المرضى والطرائق:** هذه دراسة أرشيفية إحصائية مكونة من مئة وثمانية وخمسين مريض ومريضة مصابون بالسرطان يقطنون في مناطق مختلفة في محافظة ديالى تم تشخيصهم في مختبر مختير الأنسجة المرضية في مدينة بعقوبة في الفترة الممتدة من عام ٢٠١٢ الى عام ٢٠١٦ م ، لكل الحالات عملنا تحليل إحصائي للعمر والجنس و درجة السرطان وإنتشاره ودراسة العلاقة فيما بينها و السرطان.

**النتائج:** هذه دراسة أرشيفية إحصائية مكونة من مئة وثمانية وخمسين مريض ومريضة مصابون بالسرطان يقطنون في مناطق مختلفة في محافظة ديالى تم تشخيصهم في مختبر مختير الأنسجة المرضية في مدينة بعقوبة في الفترة الممتدة من عام ٢٠١٢ الى عام ٢٠١٦ م ، لكل الحالات عملنا تحليل إحصائي للعمر والجنس و درجة السرطان وإنتشاره ودراسة العلاقة فيما بينها و السرطان. في هذه الدراسة وجدنا بأن معظم حالات السرطان تحدث في العقد السادس من العمر وبمعدل عمري (٥٣ سنة). وجدنا بأن سرطان الثدي أكثر شيوعا في العقد الخامس والسادس من العمر بمعدل عمري (٥٠ سنة) وسرطان الجلد يحدث في أعمار أكبر نسبيا (٦٣ سنة) أما بالنسبة لسرطان العقد اللمفاوية فيحدث في أعمار أصغر نسبيا (٤١ سنة). نسبة المرضى الرجال للنساء المصابين بالسرطان ١/١,٦ .

**الاستنتاجات:** سرطان الثدي هو السرطان الأكثر شيوعا في محافظة ديالى. للعمر تأثير طردي مع حصول السرطان ودرجته ومرحلته.

**الكلمات المفتاحية:** السرطان ، محافظة ديالى ، سرطان الثدي

البريد الإلكتروني: [Salam.Hasoon@yahoo.com](mailto:Salam.Hasoon@yahoo.com)

تاريخ استلام البحث: ١٠ أيار ٢٠٢٢

تاريخ قبول البحث: ١٤ آب ٢٠٢٢

<sup>١,٢</sup> مستشفى بعقوبة التعليمي - ديالى - العراق