

# **The Incidence of Prostate Carcinoma and Its Grading in Basra City**

A study submitted to the scientific council of the Arab board of anatomical pathology in partial fulfillment for the degree of fellowship of the Arab Board for Medical specialization in pathology

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2021

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿وَيَسْأَلُونَكَ عَنِ الرُّوحِ قُلِ  
الرُّوحُ مِنْ أَمْرِ رَبِّي وَمَا أُوتِيتُمْ  
مِّنَ الْعِلْمِ إِلَّا قَلِيلًا﴾

صدق الله  
العظيم

الاسراء (85)

## Dedications

To my soulmate the one who always supports me and be by my side (my husband).

To my strength and my life my beautiful family.

To my two angels Wameedh & Elena.

# Acknowledgments

My great appreciate for support and help  
to my supervisor **Dr. Jasim M Al-Diab**  
for every minute from his time to  
complete this work

To all my patients for being part of the  
study

# Abstract

## **Introduction**

Prostate cancer is the second malignant tumor worldwide after lung cancer and the fifth leading cause of cancer deaths in males. The prostate cancer incidence and mortality worldwide correlate with increasing age, the average age is 66 years. The incidence of prostate cancer in Iraq and Asia is relatively lower than United states and Europe.

## **Aim**

This study aims to find the incidence rate of prostate carcinoma in Basra city. The study also aims to evaluate the age-year and age-Gleason score relationships during the period of study.

## **Materials and method**

Data were collected from computerized histological reports archives from governmental hospitals and private pathologic laboratories in Basra from 2015 through the year 2019.

Demographic data were based on age and Gleason score.

## **Results**

The total number of 160 cases were included in this study.

While the 5-year incidence rate was 2.2 per 100000 men, The year 2015 carried the highest incidence rate (2.8 per 100000 men). There was no significant difference in the incidence rate among the study years.

The mean age of the patients was 69.11 years . There was no significant difference in the patient age means among the study years, It is noticeable that there is statistical significant difference among the mean cancer

grades during the study years. The highest-grade mean was the year 2016 (7.42) and the lowest grade mean was in the year 2015 (6.42).

there was statistically significant no any correlation between the patients' age and cancer grade .

### **Conclusion**

The results of this study revealed that the incidence rate was 2.2 per 100000 men in the five years (2015-2019) while the year 2015 carried the highest incidence rate (2.8 per 100000 men), the lowest rate was in the year (2019) (1.7 per 100.000 men). The mean age was 69.11 year and there is no significant difference in relation with study years, also there is no significant relationship between the age and Gleason score.

# Introduction

Prostate cancer is the second malignancy in men worldwide after lung cancer and the fifth leading cause of cancer deaths in males with an age-standardized global mortality rate of 7.8/100 00-0.[1]

The prostate cancer is one of the top 5 cancers affecting men in Iraq by the Iraqi GLOBOCAN 2018 [2] .

The most important risk factors for prostate cancer are age, race, and a positive family history of prostate cancer. Furthermore, there is modifiable or behavioral factors have been found to be associated with prostate cancer risk ,Several factors, including smoking and obesity, are only weakly related to prostate cancer onset but are positively associated with prostate cancer mortality.[3] .

The prostate cancer incidence and mortality worldwide correlate with increasing age with the average age of 66 year.

The prostate cancer is more frequent in African-American men, the incidence rates are higher when compared to the White men[1]. Prostate cancer as many common cancers tend to cluster in families, 5-10% of prostate cancer cases is described as familial cancer which is considered to result from heritable risk genetic factors [4].

The risk of prostate cancer increases with the increasing number of affected relatives, especially those diagnosed at a young age. Men with an inherited predisposition are more likely to be affected at age younger than 55 years.

Prostate cancer may be asymptomatic at early stage, and may need minimal or even no treatment. The most frequent complaints are difficulty with urination, frequency, and nocturia. However ,the advanced stage of the disease may present with urinary retention and back pain ,as axis skeleton is the most common site for metastasis [1] .

Prostate cancer can be detected by digital rectal examination (DRE), transurethral ultrasonography and elevated serum PSA ( above 4ng/dl ).[5]

However, because men without cancer have also been found with elevated PSA, a tissue biopsy is the standard of care to confirm cancer's presence.[1]

Microscopically , The vast majority of prostatic carcinoma is of adenocarcinoma type , in which Ninety five percent is of acinar type and five percent is of ductal type [6].

The prostatic carcinoma is usually graded according to Gleason grading system , which is based on architectural pattern[7] . grading system was developed between 1966 and 1974 by Donald Gleason and the Veterans Administration Cooperative Urologic Research Group. The system assigns histologic patterns 1 through 5, adding the most and second most common patterns with Gleason scores ranging from 2 to 10. Over fourteen years, histologic and clinical diagnosis of prostate cancer along with its treatment has evolved, leading to revisions of the Gleason system first codified in 2005 and more recently in 2014. The current Gleason grading differs dramatically from the original system [8]

The Gleason grades 1 and 2 are not use now, because those patterns of cancer have the same outcome as grade 3; however, grade 3 cancer not metastasizes and treated by active surveillance. The lowest **Gleason score** is  $3+3=6$  which is a low-**grade** cancer. Gleason score 7 includes Prostatic carcinoma with  $3+4=7$  and  $4+3=7$ , which is of intermediate grade, Studies have shown that patients with Gleason score 7 with primary pattern 3 have a better clinical outcome than with primary pattern 4. **Gleason score** of **8** ,9, or 10 is a high-**grade** cancer. Prostatic carcinoma with Gleason score 9 to 10 have worse prognosis than tumors with Gleason score  $4+4=8$ . Gleason scores play important role for treatment and prognostic purposes[9].

In 2013 a new grading system, based on data from Johns Hopkins Hospital, was proposed to address the confusion inherent in the Gleason system, five grade group system based on the much-revised original



Gleason score: grade group 1 (Gleason score 6), grade group 2 (Gleason score 3 + 4 = 7), grade group 3 (Gleason score 4 + 3 = 7), grade group 4 (Gleason score 8), and grade group 5 (Gleason score 9–10). This new grading system beginning with grade group 1 has the potential benefit of reducing fear and may contribute to a decrease in the over treatment of low-grade prostatic carcinoma detected by prostate-specific antigen (PSA) screening[8].

The treatment choices for prostatic carcinoma are radical prostatectomy, brachytherapy, targeted focal cryotherapy, external beam radiation therapy, watchful waiting (for low grade, localized tumor, or limited life expectation), chemotherapy or hormonal therapy (LHRH analogous, anti-androgen).

Prognosis of prostate cancer depends on stage ,Gleason score , surgical margin , pre-operation PSA , peri neural invasion , angiolymphatic invasion and size of nodal metastasis[10].

# **Aim of study**

This study aims to find the incidence rate of prostate carcinoma in Basra city.

The study also aims to evaluate the age-year and age-Gleason score relationships during the period of study.

# Methodology

Cross section study was done in Basra city/Iraq. In period from beginning of January 2015 till the end of December 2019.

Cases were collected from computerized histological reports archives from governmental hospitals and private pathologic laboratories.

Demographic data were based on age and Gleason score.

Statistical Analysis and Data representation was done using **Statistical Package for the Social Sciences (SPSS)** v.24 and MICROSOFT Excel 2019.

P value < 0.05 was regarded significant.

The incidence rate was calculated for five years (number of new cases /numbers of population at risk) X 100000 population.

One way ANOVA and Pearson test were used for comparison between variables.

# Results

A total number of 160 cases of prostate carcinoma were included in this study.

Table(1) shows that the 5-year incidence rate was 2.2 per 100000 men .

The year 2015 carried the highest incidence rate (2.8 per 100000 men). The mean age of the patients was 69.11 years (Table 2) . There was no significant difference in the patient age means neither among the study years (Table 3), nor between each 2 years during the 5-years period of the study (Table 4).

Table (1): The frequency and incidence of prostate cancer

Year	Frequency	Percent	Total males	Incidence/ 100000
2015	38	23.8	1349539	2.8
2016	26	16.3	1386195	1.9
2017	33	20.6	1423386	2.3
2018	37	23.1	1461123	2.5
2019	26	16.3	1499597	1.7
Total	160	100.0	7119840	2.2

Table (2): Age characteristics of the study population

	Age (year)
Mean	69.11
Std. Deviation	8.67
Minimum	45
Maximum	98
Total	160

Table (3): Differences in the mean age of patients according to year of occurrence

Year	N	Mean age (year)	SD	F	Sig.
2015	38	68.08	9.29	0.99	0.41
2016	26	70.15	8.79		
2017	33	69.42	7.01		
2018	37	67.54	9.63		
2019	26	71.38	8.02		
Total	160	69.11	8.67		

Table (4): Differences in the mean age of patients between each two years of occurrence

(I) Year	(J) Year	Mean Difference (I-J)	Sig.
2015	2016	-2.075	0.348
	2017	-1.345	0.515
	2018	0.538	0.788
	2019	-3.306	0.136
2016	2015	2.075	0.348
	2017	0.730	0.749
	2018	2.613	0.241
	2019	-1.231	0.609
2017	2015	1.345	0.515
	2016	-0.730	0.749
	2018	1.884	0.365
	2019	-1.960	0.390
2018	2015	-0.538	0.788
	2016	-2.613	0.241
	2017	-1.884	0.365
	2019	-3.844	0.085
2019	2015	3.306	0.136

	2016	1.231	0.609
	2017	1.960	0.390
	2018	3.844	0.085

In Table (5), it is noticeable that there is statistically significant difference among the mean cancer grade in the study years, with the highest grade mean in the year 2016 (7.42) and the lowest in the year 2015 (6.42). Table (6) clarifies that the reason behind this significance was 2015.

Table (5): Differences in the mean grades of disease according to year of occurrence

Year	N	Mean Grade	SD	F	Sig.
2015	38	6.42	1.33	3.38	0.01
2016	26	7.42	1.24		
2017	33	7.24	1.35		
2018	37	7.05	1.18		
2019	26	7.15	0.83		
Total	160	7.02	1.25		

Table (6): Differences in the mean grade of disease between each two years of occurrence

(I) Year	(J) Year	Mean Difference (I-J)	Sig.
2015	2016	-1.002 <sup>*</sup>	0.001
	2017	-0.821 <sup>*</sup>	0.005
	2018	-0.633 <sup>*</sup>	0.026
	2019	-0.733 <sup>*</sup>	0.019
2016	2015	1.002 <sup>*</sup>	0.001
	2017	0.181	0.572
	2018	0.369	0.237
	2019	0.269	0.426
2017	2015	0.821 <sup>*</sup>	0.005
	2016	-0.181	0.572

	2018	0.188	0.518
	2019	0.089	0.781
2018	2015	0.633*	0.026
	2016	-0.369-	0.237
	2017	-0.188-	0.518
	2019	-0.100-	0.749
2019	2015	0.733*	0.019
	2016	-0.269-	0.426
	2017	-0.089-	0.781
	2018	0.100	0.749

\*. The mean difference is significant at the 0.05 level.

Table (7) shows that there was no any correlation between the patients' age and cancer grade (p-value= 0.65).

Table (7): Correlation between the patients' age and disease grade

		Grade
Age (Year)	Pearson Correlation	0.04
	Sig.	0.65
	No.	160

# Discussion

The prostate cancer is the second malignancy in men worldwide after lung cancer[1] .

The result of this study showed that the incidence rate of prostatic carcinoma in Basra city for the five years (2015-2019) was 2.2 per 100,000 men and there was no significant difference in the incidence rates among these years with the highest incidence rate 2.8 per 100,000 men was in the year 2015 and the lowest was in the year (2019) of 1.7 per 100.000 men .This differences may be explained by the fact that prostate carcinoma is asymptomatic tumor , particularly in early stages , and it is slowly growing, and it's usually diagnosed in late stage . This result agreed with Khan,(2011) [11] . This may also be due to decrease visiting hospital for screening.

This study agree with previous study done by Omran S. Habib in Iraq from 2000-2016 ,which showed the incidence rate of prostate cancer in Basra city was 1.64 per 100.000 men [12] . In other study in Iraq from 2000-2016 done by Ashraf MA. Hussain et al , showed a rise from 1.85 in 2000 to 4.13/100 000 in 2016 , In which rapid increase in incidence by 2.2-fold [13] , that seem to be different from this study .

Globally, incidence rates are three fold higher in developed than in developing countries (37.5 and 11.3 per 100,000 ) , Incidence rate range from 6.3 to 83.4 per100,000 men across the world , the highest rates found in Northern and Western Europe (e.g., Norway, Sweden, Ireland) , the Caribbean , Australia/New Zealand , Northern America (particularly in the United States) , and Southern Africa and the lowest rates in Asia and Northern Africa according to GLOBOCAN 2018 [2] . Although ; the rising incidence rate of prostatic cancer seems to be global, However, many regional countries have the same rising trend but the incidence rate much higher, like Iran (9.11/100 000) and Turkey (40.6



/100 000) according to study done by Soheil Hassanipour et al (2018)[14]

The age is very important risk factor for prostate cancer. The mean age of the patients was 69.11 years, with oldest age of (71.38 year) in the year 2019 and the youngest age of (67.54 year) in the year 2018, There was no significant difference in the patient age means among the five years in this study, which agreed with previous research that consider age as a risk factor for prostate cancer. The result of this study is similar to other previous studies ; In Iraq , Al-Tmami et al ,(2014) , reported that the prostate cancer occurred in age group more than 60 years [15], Dr.Khalidah M. Khudur (2012) , found that (40%) of patients with prostate cancer were in age group (60 and above ) [16] . Al-Badran et al , (2020) , reported that the incident of prostate cancer in Basra increased with age and the age group of (66-75) showed the highest percentage of 48% [4] . Walsks, (2011), In united states found that more than (65%) of all prostate cancer are diagnosed in age of 65 year and the average age was 69 year , after that age , the chance of developing prostate cancer becomes more common in men [17] .

In this study the mean value of Gleason score was (7.02) , with the highest score mean in the year 2016 (7.42) and the lowest in the year 2015 (6.42) , and there was no correlation between the patients age and the Gleason score ,this study showed similarity in result to other previous studies ; Basiri et al , (2008-2010) , showed that the median Gleason score in most Iranian provinces was 7 and also there was no concordance between the age and the Gleason score [18] . Antunes et al , (2005) , Concluded that age does not represent a determining factor for pathological findings relative to Gleason score [19] .

However, other studies showed disagreement with this. Pepe et al (2014) , found the Gleason score progressively increased with the age at diagnosis, and a significant correlation between Gleason score  $\geq 8$  and age above 80 years was demonstrated [20] , Wang et al , (2020) , in China , Described that the age is an important predictor for the Gleason

score upgrading and pathological upstaging thorough consideration of age not only prompts more accurate risk stratification but also helps providers to select optimal therapies for patients with prostate cancer[21] , Furthermore Gershman et al ,(2013) found association between older age and Gleason upgrading [22] .

# Conclusion

The results of this study revealed that the incidence rate of prostate carcinoma was 2.2 per 100000 men in the five years (2015-2019) and the year 2015 carried the highest incidence rate (2.8 per 100000 men) while the lowest rate was in the year (2019) of 1.7 per 100.000 men.

There was no significant difference in the incidence rate among the study years. The mean age was 69.11 year and there is no significant difference in relation with study years, also there is no significant relationship between the age and Gleason score.

The score mean was (7. 2) in these five years, With the highest score mean in 2016 (7.42) and the lowest in 2015 (6.42).

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