Original Article

DOI: 10.4274/uob.galenos.2021.2021.11.1

Bull Urooncol 2022;21(1):1-4

Turkey Prostate Cancer Map 2021: Turkish Urooncology Association Prostate Cancer Database Report

Bahadır Şahin[1], Serdar Çelik[2], İlker Tinay[3], Saadettin Eskiçorapçı[4], Güven Aslan[5], Sinan Sözen[6], Süleyman Ataus[7], Levent Türkeri[8]

[1]*Marmara University Pendik Training and Research Hospital, Clinic of Urology, İstanbul, Turkey*
[2]*University of Health Sciences Turkey, İzmir Bozyaka Training and Research Hospital, Clinic of Urology, İzmir, Turkey*
[3]*Anatolian Health Center, Clinic of Urology, İstanbul, Turkey*
[4]*Acıbadem Atakent Hospital, Clinic of Urology, İstanbul, Turkey*
[5]*Dokuz Eylül University Faculty of Medicine, Department of Urology, İzmir, Turkey*
[6]*Gazi University Faculty of Medicine, Department of Urology, Ankara, Turkey*
[7]*Forte Urology Center, İstanbul, Turkey*
[8]*Acıbadem University Faculty of Medicine, Department of Urology, İstanbul, Turkey*

Abstract

Objective: This study aimed to present the data of patients with prostate cancer (PCa) whose detailed information was stored in the Urologic Cancer Database-Prostate, Urooncology Association, Turkey with the title of "Turkey Prostate Cancer Map 2021."
Materials and Methods: Patient data between 1995 and 2020 were retrospectively scanned. The age of the patients, their distribution according to age groups, symptoms during diagnosis, examination findings [digital rectal examination (DRE)], prostate-specific antigen (PSA) values, biopsy methods in the diagnosis, metastatic disease rates, treatment methods, and progression rates at follow-up were examined. These results were compared with the results of the previous report, namely "Prostate Cancer Incidence (Incidence) in Turkey," by the Urooncology Association in Turkey in 2009.
Results: This study analyzed the data of 5040 patients from 19 different centers. The mean patient age was 63.6 (37-97) years. The age distribution examination revealed that most patients (49.8%) were aged 60-69 years. Of the patients, 51.8% were symptomatic at the time of diagnosis. The presence of symptoms was determined in 88.6% in 2009 data. The DRE of patients revealed that 25% of patients had malignancy findings. The PSA distribution examination revealed a >10 ng/mL PSA value in 37.5% of patients. With the increasing use of magnetic imaging resonance (MRI) in PCa diagnosis over the years, increased MR-fusion biopsy rates have been observed. Considering the biopsy data, 91% of patients were diagnosed with a classical transrectal ultrasound-guided biopsy, whereas 9% were diagnosed with MR-Fusion biopsy. Fusion biopsies revealed that 23% of patients with Prostate Imaging-Reporting and Data System (PI-RADS) 4 lesion and 57% with PI-RADS 5 lesion were diagnosed with cancer.
Of the patients, 8.9% of patients had metastases during the initial diagnosis. This rate was 17% in 2009 data. The treatment methods examination after the diagnosis revealed that 73.9% of patients had undergone radical prostatectomy. This rate was 51.8% in 2009. Robotic and laparoscopic approaches, which are among the surgical modalities, have increased over the years. However, the most frequently applied modality in our country was open radical prostatectomy with 62.6%. Considering the follow-up data after treatment, 8.9% of patients had progression, of which 62.6% was biochemical, 30.2% was radiological, and 6.9% was a clinical progression.
Conclusion: Technological advancements for PCa diagnosis (MRI and MR-guided biopsies) are becoming a routine part of daily practice compared to the results of the "Prostate Cancer Incidence in Turkey" project in 2009. The comparative study results revealed that the rate of symptomatic and metastatic disease decreases at the time of diagnosis, and laparoscopic and robotic surgery methods are used at increasing rates for localized disease.
Keywords: Epidemiology, prostate, prostate biopsy, prostate cancer

Introduction

Prostate cancer (PCa) is the most frequently diagnosed male cancer and second leading cancer-related cause of death in males, where overall and cancer-specific survival rates are >90% even at 15 years of localized disease (1). Not many epidemiological studies on PCa in Turkey are reported; however, the Urooncology Association in Turkey conducted and reported "Prostate Cancer Incidence in Turkey" back in 2009 (2).This study aimed to present the data of patients with PCa, whose

Cite this article as: Şahin B, Çelik S, Tinay İ, Eskiçorapçı S, Aslan G, Sözen S, Ataus S, Türkeri L. Turkey Prostate Cancer Map 2021: Turkish Urooncology Association Prostate Cancer Database Report. Bull Urooncol 2022;21(1):1-4

Address for Correspondence: Bahadır Şahin, Marmara University Pendik Training and Research Hospital, Clinic of Urology, İstanbul, Turkey
Phone: +90 555 357 12 61 **E-mail:** drbahadirsahin@gmail.com **ORCID-ID:** orcid.org/0000-0002-4874-4178
Received: 09.11.2021 **Accepted:** 09.11.2021

information was stored in the Urologic Cancer Database-Prostate, Urooncology Association in Turkey (UroCaD-P), as well as compare the current results with the previous report (2) and demonstrate the paradigm changes in PCa diagnosis and treatment.

Materials and Methods

The data source for the present study was the nationwide database of UroCaD-P. Data collection revealed 5,040 patients with PCa in UroCaD-P. The study data were collected by REDCap data collection software that was developed by Vanderbilt University and licensed by Urooncology Association in Turkey (3,4). All the data are kept in a secure server, and all personal information of patients was anonymized. Since this study is designed as a database report ethics committee approval was not obtained.

Study Parameters

-Demographic properties (age, place of birth, place of residence, etc.)

-Clinical Features (complaints, concomitant diseases, family history of PCa, etc.)

-Digital rectal examination (DRE) findings

• Prostate-specific antigen (PSA) levels at the time of diagnosis

• Pre-diagnostic magnetic resonance imaging (MRI)

-Biopsy modality

-Histopathologic findings on biopsy

-First-line treatment choices

-Preferred surgical modalities

-Histopathologic findings on surgery

-Pathological stage

-Follow-up data

Statistical Analysis

Statistical analyses were performed with python. The libraries used for analysis include Pandas (5,6), Numpy (7), and Scipy (7). JupyterLab (8) was used as the coding interface. The scaler variables were investigated using visual (Histograms, QQ Plots) and analytical methods (Kolmogorov-Smirnov, Shapiro-Wilk, and D'Agostino's κ^2 tests) to determine the normality of distribution. Descriptive statistics are given as mean and standard deviation if the scalar variable is distributed normally and as median and interquartile range if not. Case numbers and percent were given for statistical analysis of categorical variables. This is a sectional study, thus no hypothesis tests and p-values.

Results

The study consisted of 5,040 patients with PCa who were diagnosed between 1995 and 2021 from 19 different data-providing centers across Turkey. The patient's birthplace and place of the residence revealed that patients were from 80 different cities of Turkey. The mean patient age was 63.6±7.5 years. Most patients were between the ages of 60 and 69 years (Figure 1).

Of the patients, 51.8% had complaints at the time of diagnosis. The most common complaint was lower urinary tract symptoms (Figure 2). Most patients (75.1%) had no pathological finding on their initial DRE. The mean PSA value of patients was 16.2±27.5. Most patients (41.7%) had a PSA value between 4 and 10 (Figure 3).

Our results revealed that MRI before PCa diagnosis has become an increasingly preferred examination over the years (Figure 4). The most common lesion group in patients with PCa was Prostate Imaging-Reporting and Data System (PI-RADS) 4. MRI and MR-guided biopsies increased over the years; however, the ultrasound-guided transrectal biopsy was still the most commonly (90.9%) used technique for PCa diagnosis. The cancer detection ratio was slightly higher in MR-guided biopsies. Of the patients, 57.4% have a (PI-RADS) 5 lesion, thus PCa is diagnosed.

The metastatic disease ratio at the time of diagnosis was 8.9%. The use of Gallium (Ga)-68 prostate-specific membrane antigen (PSMA) positron emission tomography (PET)/computed tomography scintigraphy was determined in 198 patients, of whom 25.3% had metastasis.

The most commonly chosen treatment was radical prostatectomy (RP). Minimally invasive surgical techniques, such

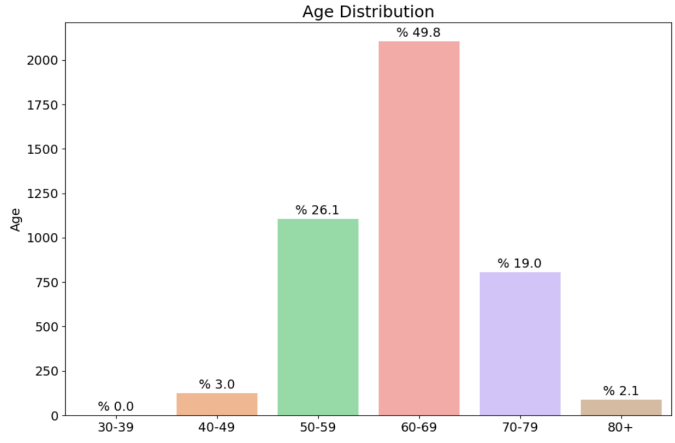

Figure 1. Age distribution of patients

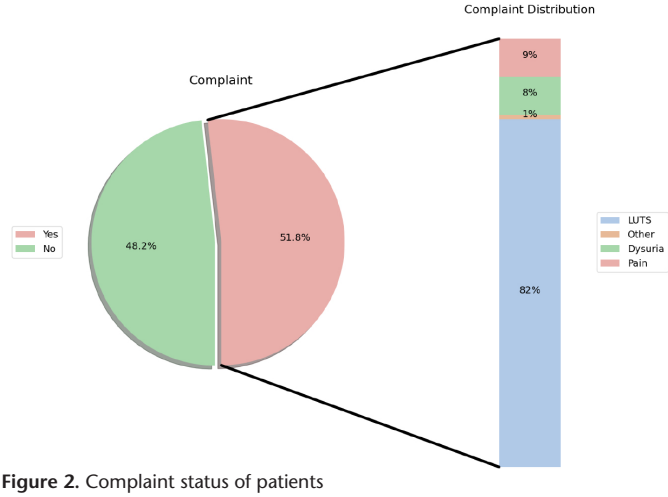

Figure 2. Complaint status of patients

as robotic or laparoscopic RP, have been increasing over the past years; however, open RP was still the most common RP modality (62.6%). The most seen pathological stage was T2, which was observed at the rate of 45.8% in patients after RP.

The follow-up revealed a progression of disease in 8.9% of patients. Biochemical progression was more commonly observed (62.9%) compared to radiological or clinical progression.

Discussion

Turkey had very little reliable data on the epidemiological aspects of PCa. In 2009, Eser et al. (9) published their epidemiological data and demonstrated PCa as the fifth most common cancer in İzmir, and revealed an increased PCa incidence over the years. In the same year, the "Prostate Cancer Incidence in Turkey" project is conducted with the Urooncology Association in Turkey and revealed that 39% of patients were between 60 and 69 years of age (2). Likewise, the most common age group in PCa diagnosis was 60-69 years (49.8%) in this study. Previous studies showed that PCa is rarely observed before the age of 65 years and is more commonly seen between the ages 65 and 70 years, which was in concordance with our study (10,11). Our study revealed that 51. 8% of patients were symptomatic at the time of diagnosis. The presence of symptoms was determined in 88.6% in 2009 data. The presence of complaints was quite different between the two studies; however, DRE positivity was similar (24.9% vs. 25.4%).

In 2009, most patients had a PSA level of <10 ng/dL, which was consistent with our results. The current report revealed that the mean PSA level at the time of diagnosis was similar to 2009 data and two other past studies conducted in Greece and Spain (11,12). Previous data suggests that patients have more advanced PCa with the increasing PSA levels (13,14). Current data also showed that patients with clinically significant PCa were in the higher percentage in the higher PSA level groups. More patients have PSA values of <4 ng/dL in this study compared to previous studies. Some clinics revealed that the threshold for normal PSA value is regarded as 2.5 ng/dL in Turkey and this may be the cause of the increased percentage of patients with lower PSA levels.

Multiparametric prostate MRI has been a promising modality for diagnosing clinically significant PCa (15,16) and is now regarded as one of the first-line imaging modalities before prostate biopsy in the European Association of Urology guidelines with strong recommendations (17). Consistently, data of the current report shows that the use of both MRI and MR-guided biopsies for PCa diagnosis is increasing in recent years.

The treatment methods examination after the diagnosis revealed that 73.9% of patients had undergone RP. This rate was 51.8% in 2009. Robotic and laparoscopic approaches, which are among the surgical modalities, have increased over the years. Similarly, a study in the US demonstrated increased minimally invasive surgical techniques over the years (18).The metastatic disease rate in our study was lower compared to the 2009 study, which may be due to an increased awareness of PCa in the population, increased availability of healthcare services, and increased usage of PSA testing by general practitioners. In recent years, Ga-68 PSMA PET is also used for screening patients with PCa for metastasis. A recent study revealed that the sensitivity and specificity of PSMA PET for lymph node metastasis wave 53.3% and 85.7%, respectively (19). Our study revealed a limited number of patients who had PSMA PET screening before initial treatment and metastasis ratio as 25.3%. A recent study observed the advanced disease in 35.3% of high-risk patients with PCa (20). Our study included not only high-risk patients but also low and intermediate-risk ones, thus our result seems to be in concordance with this recent study.

The progression rate was 8.9% for all the patient groups in our study. Most studies on progression focus on specific patient groups or risk factors (obesity etc.). This study is a population base report, thus further risk factor analysis for progression was not performed; however, our study demonstrates that in most patients, PCa progression is seen as a biochemical progression.

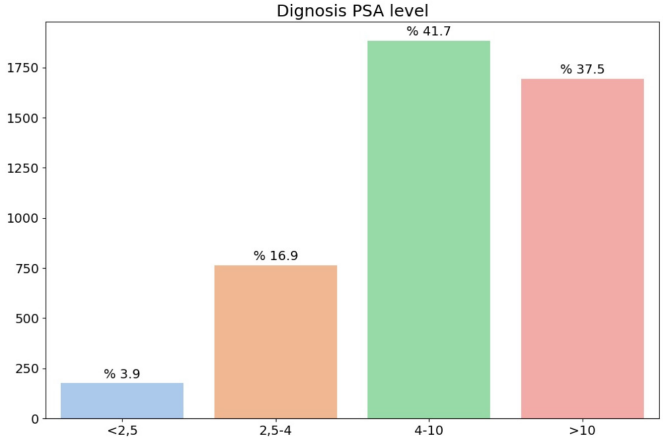

Figure 3. PSA levels at the time of diagnosis

PSA: Prostate-specific antigen

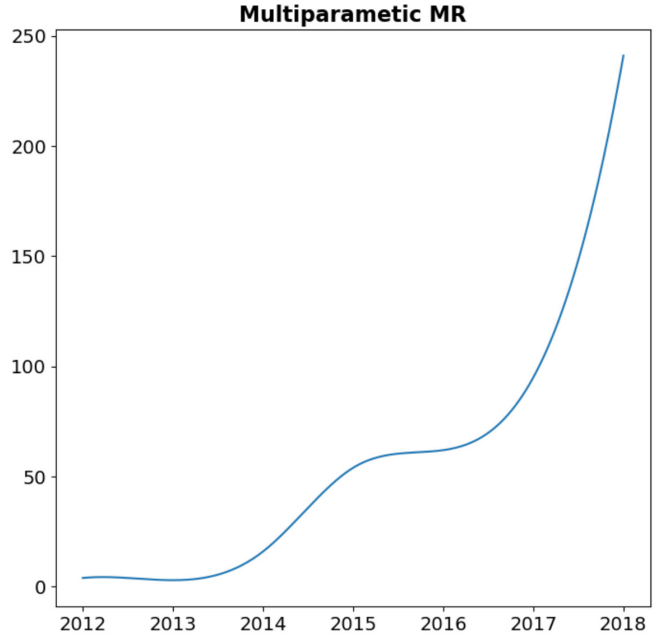

Figure 4. Usage of Multipararmetric MRI with time

MRI: Magnetic resonance imaging

Study Limitations

Our study is not without limitations. It is a population-based study, thus having more participating centers and patients would increase its strength; however, authors feel confident that results of this report could be generalized nationwide since all participating centers were referral centers in their region and all over Turkey.

Conclusion

Therefore, technological advancements for PCa diagnosis (MRI and MR-guided biopsies) are becoming a routine part of daily practice compared to the results of the "Prostate Cancer Incidence in Turkey" project conducted in 2009. The study comparative results revealed that the rate of symptomatic and metastatic disease decreases at the time of diagnosis, and laparoscopic and robotic surgery methods are used at increasing rates for localized disease.

Acknowledgements

Publication: The results of the study were not published in full or in part in form of abstracts.

Contribution: There is not any contributors who may not be listed as authors.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: We would like to thank AstraZeneca for their unconditional support for this project.

Ethics

Ethics Committee Approval: Since this study is designed as a database report ethics committee approval was not obtained.

Informed Consent: All the data are kept in a secure server, and all personal information of patients was anonymized.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Supervision: S.E., G.A., S.S., S.A., L.T., Concept: İ.T., S.E., G.A., S.S., S.A., L.T., Design: İ.T., S.E., G.A., S.S., S.A., L.T., Data Collection or Processing: B.Ş., Analysis or Interpretation: B.Ş., Literature Search: B.Ş., Writing: B.Ş., S.Ç., İ.T.

References

1. Howlader N, Noone A, Krapcho M, et al. SEER cancer statistics review, 1975-2017. National Cancer Institute, 2020.
2. Zorlu F, Zorlu R, Divrik RT, et al. Prostate cancer incidence in Turkey: an epidemiological study. 2014;15:9125-9130.
3. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap)--a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform 2009;42:377-381.
4. Harris PA, Taylor R, Minor BL, et al. The REDCap consortium: Building an international community of software platform partners. J Biomed Inform 2019;95:103208.
5. Reback J, McKinney W, Den Van Bossche J, et al. pandas-dev/pandas: Pandas 1.0. 3. Zenodo, 2020.
6. McKinney W. Data structures for statistical computing in python. Proceedings of the 9th Python in Science Conference: Austin: TX; 2010. p. 51-56.
7. Virtanen P, Gommers R, Oliphant TE, et al. SciPy 1.0: fundamental algorithms for scientific computing in Python. Nat Methods 2020;17:261-272.
8. Kluyver T, Ragan-Kelley B, Pérez F, et al. Jupyter Notebooks-a publishing format for reproducible computational workflows. 2016. https://eprints.soton.ac.uk/403913/1/STAL9781614996491-0087.pdf
9. Eser S, Zorlu F, Divtik RT, et al. Incidence and epidemiological features of cancers of the genitourinary tract in Izmir between 1993-2002. Asian Pac J Cancer Prev 2009;10:491-496.
10. Siegel R, Naishadham D, Jemal A. Cancer statistics for hispanics/latinos, 2012. CA Cancer J Clin 2012;62:283-298.
11. Cózar JM, Miñana B, Gómez-Veiga F, et al. Prostate cancer incidence and newly diagnosed patient profile in Spain in 2010. BJU Int 2012;110:701-706.
12. Grivas N, Hastazeris K, Kafarakis V, et al. Prostate cancer epidemiology in a rural area of North Western Greece. Asian Pac J Cancer Prev 2012;13:999-1002.
13. Thompson IM, Ankerst DP, Chi C, et al. Assessing prostate cancer risk: results from the Prostate Cancer Prevention Trial. J Natl Cancer Inst 2006;98:529-534.
14. D'Amico AV, Whittington R, Malkowicz SB, et al. Pretreatment nomogram for prostate-specific antigen recurrence after radical prostatectomy or external-beam radiation therapy for clinically localized prostate cancer. J Clin Oncol 1999;17:168-172.
15. Bratan F, Niaf E, Melodelima C, et al. Influence of imaging and histological factors on prostate cancer detection and localisation on multiparametric MRI: a prospective study. Eur Radiol 2013;23:2019-2029.
16. Le JD, Tan N, Shkolyar E, et al. Multifocality and prostate cancer detection by multiparametric magnetic resonance imaging: correlation with whole-mount histopathology. Eur Urol 2015;67:569-576.
17. Mottet N, van den Bergh RCN, Briers E, et al. EAU - ESTRO - ESUR - SIOG Guidelines on Prostate Cancer 2020. European Association of Urology Guidelines. 2020 Edition. Vol presented at the EAU Annual Congress Amsterdam 2020. Arnhem, The Netherlands: European Association of Urology Guidelines Office; 2020.
18. Lowrance WT, Eastham JA, Savage C, et al. Contemporary open and robotic radical prostatectomy practice patterns among urologists in the United States. J Urol 2012;187:2087-2092.
19. Öbek C, Doğanca T, Demirci E, et al. The accuracy of 68 Ga-PSMA PET/CT in primary lymph node staging in high-risk prostate cancer. Eur J Nucl Med Mol Imaging 2017;44:1806-1812.
20. Klingenberg S, Jochumsen MR, Ulhøi BP, et al. 68Ga-PSMA PET/CT for Primary Lymph Node and Distant Metastasis NM Staging of High-Risk Prostate Cancer. J Nucl Med 2021;62:214-220.