Research Article

A Unicenter Cross-Sectional Study of Cancer Patients data admitted at Urmia Milad Hospital: Pathobiological and Demographic Findings

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Article info:
Received: 30 July 2024
Revised: 29 August 2024
Accepted: 5 September 2024

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ABSTRACT

Objectives: Cancer is one of the most prevalent diseases in Iran and worldwide. Epidemiological studies indicate a rising incidence of cancer. This study aimed to evaluate the clinical, demographic, and pathobiological findings in cancer patients admitted to Urmia Milad Hospital.

Methods: The records of all patients hospitalized between 2019 and 2023 were reviewed and analyzed. Examined variables included age, gender, pathology and laboratory reports, and primary complaints. The exclusion criteria for the study were incomplete records or insufficient data.

Results: The mean age of female patients was significantly lower than that of male patients. Breast and bladder cancers were the most commonly referred cancers, whereas laryngeal and cervical cancers had the lowest frequency.

Conclusion: The findings of this study indicate that disease patterns, primary complaints, laboratory findings, and pathology characteristics in patients share both similarities and differences with international trends. It should be noted that this single-center study does not provide a comprehensive picture of cancer statistics in the province, though it offers valuable insights into current conditions.

Keywords: Cancer, Age, Sex, Laboratory Findings, Urmia

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Citation: Alikhani A, Ghayouri Miyandoab A, Salehi M, Entezami H, Gholinejad Z. A Unicenter Cross-Sectional Study of Cancer Patients data admitted at Urmia Milad Hospital: Pathobiological and Demographic Findings . Acta Biochimica Iranica. 2024;2(3):139-145.

https://doi.org/***

Introduction

Cancer is a complex group of diseases characterized by the uncontrolled growth and spread of abnormal cells, which can invade and destroy healthy tissues. It arises from genetic mutations caused by various factors, including lifestyle choices (e.g., smoking, poor diet), environmental exposures (e.g., UV radiation, pollution), infections (e.g., HPV, hepatitis), and inherited genetic defects (1). While advancements in early detection, targeted therapies, and immunotherapy have improved survival rates, cancer remains a leading cause of death worldwide. Prevention through healthy habits, vaccination (e.g., HPV, hepatitis B), and regular screenings plays a crucial role in reducing risk (1, 2).

Sex differences in cancer epidemiology are among the most significant findings. Men are more prone to cancer-related mortality, particularly from hematological malignancies. Differences in cancer incidence between

sexes are attributed to genetic/molecular regulation and the influence of sex hormones, such as estrogen (3).

In Iran, an analysis covering 2000 to 2017 revealed that the most prevalent cancers among Iranian men were skin, stomach, bladder, prostate, and colorectal cancers. In contrast, the most common cancers among Iranian women were breast, skin, colorectal, stomach, and esophageal cancers. Cancer incidence in Iran has been increasing, with higher rates observed in northern and northwestern provinces (4). Additionally, the incidence rate is generally higher in men than in women, with notable variations among provinces and differences in cancer registry quality. The risk of cancer rises significantly with age, from fewer than 25 cases per 100,000 individuals under 20 years old to approximately 350 cases per 100,000 people aged 45–49 years, surpassing 1,000 cases per 100,000 individuals over 60 years old (5).

Large-scale data collection through cancer registries and epidemiological studies helps identify high-risk populations, track trends, and assess the effectiveness of interventions. This data-driven approach informs public health policies, guides resource allocation, and fosters research into new prevention and treatment strategies (3). In this study, we collected data from patients referred to Milad Hospital in Urmia.

Materials and Methods

This descriptive-analytical study was conducted on cancer patient data from Milad International Hospital in Urmia between 2019 and 2023. The study was approved by the Research Council and the Ethics Committee of Islamic Azad University, Urmia Branch (Ethics Code: IR.IAU.Urmia.Rec.140226). Patient data were anonymized and entered into SPSS software (version 23) for analysis.

The variables examined included age, gender, chief complaints, available laboratory findings, and pathology reports. For comparisons between groups, parametric tests such as the t-test and ANOVA were utilized.

Results

Age and Gender Analysis of Cancer Patients

A total of 665 cancer patient records were collected between 2019 and 2023 at Milad International Hospital in Urmia. Breast and bladder cancers were the most commonly referred cancer types, whereas laryngeal and cervical cancers had the lowest frequency (Table 1).

The mean age of female cancer patients was 55.05 ± 15.14 years, whereas the mean age of male cancer patients was 64.42 ± 15 years (Figure 1). This difference

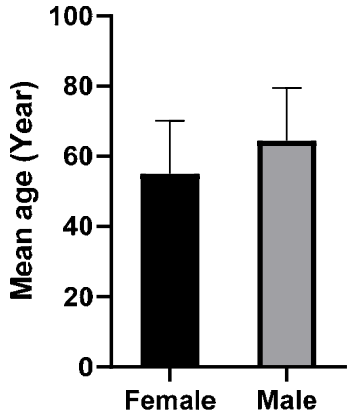

Figure 1. Mean age of cancer patients in this study based on gender.

Table 1. The frequency of various cancers among patients referred to Milad International Hospital of Urmia city.

Cancer Type	Number	Frequency
Breast	123	18.5
Bladder	115	17.3
Gastric	85	12.8
Colorectal	83	12.5
Esophagus	45	6.8
Prostate	43	6.5
Lung	36	5.4
Kidney	34	5.1
Thyroid	25	3.5
Ovary	16	2.4
Skin	14	2.1
Uterus	11	1.7
Testis	11	1.7
Blood	7	1.1
Brain	7	1.1
cervical	6	0.9
Larynx	4	0.6
Total	665	100

Table 2. The ages of patients according to the cancer type.

Cancer Type	Min Age	Max Age	Mean age
Breast	21	83	50.58 ±11.62
Skin	51	96	70±14.41
Lung	44	84	66.42±9.95
Brain Tumor	46	73	61.14±9.92
Uterus	41	79	57.36±12.50
Cervix	25	50	32.33±9.43
Bone Marrow	16	80	55.29±22.14
Testis	22	66	36.78±13.70
Stomach	27	99	68.06±15.15
Prostate	49	87	72.33±9.471
Bladder	26	93	62.16±15.14
Kidney	34	82	60.09±12.67
Rectum	26	89	60.02±13.82
Ovary	23	68	49.81±16.45
Thyroid	21	78	42.68±13.56
Larynx	52	76	64.25±11.14
Esophagus	38	95	66.58±13.16

Data are presented as mean ± SD

Table 3. The main complaints in various cancers.

Cancer Type	Main Patient Complaints
Prostate	Hematuria, urinary retention, elevated PSA titer
Kidney	Hematuria, lower back pain, hematuria with ureteral obstruction, renal failure
Stomach	Dyspepsia, abdominal pain, epigastric pain, iron deficiency anemia
Ovary	lower abdominal pain, uterine bleeding
Thyroid	Polyuria and polydipsia with bone pain, goiter
Esophagus	Dyspepsia, persistent vegetative state, weight loss, iron deficiency anemia, gastroesophageal reflux
Skin	Skin lesions
Rectum	Rectal bleeding, hematochezia, persistent vegetative state, abdominal pain, anal pain
Lung	Pulmonary obstruction, red sputum, cough, anemia, pulmonary complications pleural effusion, subacute cough
Uterus	Abnormal uterine bleeding, uterine fibroids
Cervix	Lymph node swelling
Blood	Anemia, fever, osteoporosis, thrombocytopenia, cytopenia with elevated lymphocyte count
Testis	Seminoma
Brain	Headache, ataxia, dyspepsia with right-sided hemiparesis, Lower back pain
Breast	breast mass
Larynx	Voice changes

was statistically significant ($p < 0.0001$). Table 1 presents the mean age of patients across different cancer types. Among them, prostate cancer patients had the highest mean age, while cervical cancer patients had the lowest mean age (Table 2).

Primary Complaints in Various Types of Cancer

The primary complaints varied among different types of cancer. Among patients who visited the emergency department and were subsequently referred to the oncology unit with a cancer diagnosis, pain was the most common complaint, occurring in 40% of cases, followed by disease-related symptoms in 17% of patients.

Abdominal pain was the most frequently reported type of pain, accounting for 18.4% of cases. Additional common complaints included abdominal pain (8.5%), shortness of breath (8.5%), muscle weakness (8.1%), fever (7%), and ulcers (3.6%). Table 3 presents the main complaints categorized by cancer type.

Referral cities

Patients came from across the province as well as neighboring regions. Additionally, some patients from Iraq sought treatment at this center. The highest number of referrals came from Urmia, which is expected given the hospital's location and the city's population within

the province. In total, 10 patients from Iraq visited the center for treatment.

Prostate Cancer

A total of 41 patients underwent transurethral resection (TUR) biopsies to assess prostate malignancies, with needle biopsies performed in three cases. Nine patients were diagnosed with benign prostatic hyperplasia (BPH), while nine had low-grade papillary prostate cancer. One case exhibited high-grade disease.

Hematuria was the most common reason for TUR, followed by urinary retention and elevated PSA levels. Elevated PSA levels played a significant role in patient referrals, underscoring the importance of PSA screening in prostate cancer detection.

Skin Cancer

Among 14 pathology-confirmed cases, basal cell carcinoma (BCC) was the most prevalent (9 cases), followed by squamous cell carcinoma (SCC) (5 cases). One rare case of verrucous carcinoma, a subtype of SCC, was reported. The head was the most common site for skin tumor development. Surgical excision was performed in six cases, with one case involving complete removal of the lesion and surrounding skin.

Gastric Cancer

Gastric cancer was evaluated in 85 hospitalized patients. Pathological samples included tumors, lesions, polyps, mucosal sections, and tissue from the antrum, cardia, and lower stomach. Three patients underwent total gastrectomy, while one had a distal gastrectomy. The most common symptoms were dyspepsia, epigastric pain, weight loss, nausea, vomiting, and extensive ulcers in the cardia and antrum.

Esophageal Cancer

Tumors were observed in the upper, middle, and lower esophagus, with the lower esophagus being the most susceptible. Most biopsy samples consisted of excised lesions. Squamous cell carcinoma was the predominant type. The main complaint was dysphagia, along with iron-deficiency anemia, weight loss, and abdominal pain.

Lung Cancer

A total of 34 patients were diagnosed with lung cancer. Metastasis occurred in two cases, one to the liver and another to the stomach. Notably, one patient had a history of gastric cancer. The most common sampling method was needle biopsy (23 cases), alongside biopsies from lesions and mucosa. In patients with pleural effusion, pleural fluid samples were collected. Tumors were observed in both lungs, with the upper lobe of the left lung being the most affected (5 cases). Among lung cancer subtypes, non-small cell lung cancer (NSCLC) was more common than small cell lung cancer (SCLC), with squamous cell carcinoma being the most prevalent NSCLC subtype. Tumor differentiation ranged from well-differentiated to poorly differentiated.

Laryngeal Cancer

Four patients with laryngeal cancer presented with voice changes. All cases were squamous cell carcinoma, with one exhibiting high differentiation.

Bladder Cancer

Transurethral resection (TUR) biopsies were performed on 114 patients presenting with bladder-related issues, with one case involving a needle biopsy. Surgical samples were also examined to assess surgical margins. Hematuria was the most common complaint, followed by urinary retention and dysuria with bleeding. Low-grade papillary urothelial carcinoma was detected in 67 patients, making it the most prevalent type, while 8 cases were diagnosed with high-grade papillary urothelial carcinoma..

Brain Cancer

Among the studied patients, 5 had brain tumors, including 3 cases of glioblastoma multiforme (GBM), 1 case of oligodendroglioma, and 1 case of vertebral hemangioma. The main symptoms were headache (2 cases), ataxia with headache (1 case), dyspepsia with left-sided paralysis (1 case), and lower back pain (1 case).

Kidney Cancer

This study included 34 kidney cancer patients hospitalized at Milad Hospital, Urmia. Histopathological findings showed that clear cell renal cell carcinoma (ccRCC) was the most common type, identified in 25 patients (73.5%), while papillary renal cell carcinoma (pRCC) was diagnosed in 9 patients (26.5%). There was no significant difference in age between ccRCC and pRCC groups.

For treatment, 6 patients did not undergo surgery, while 7 patients underwent left nephrectomy, 10 patients had a partial right nephrectomy, and 11 patients had a partial left nephrectomy.

Colorectal Cancer

Cancer in the rectal area was one of the most common reasons for hospital visits, with a total of 83 reported

cases. Metastasis was observed in two cases, one of which had spread to the liver. Treatments included surgical interventions such as the removal of suspicious polyps, right colon resection, and total colectomy. The sigmoid region was identified as the most critical and susceptible area for tumor growth. Most lesions appeared as polyps, while some were necrotic. The most common symptoms were abdominal pain, anal pain, bright red bleeding, and other types of rectal bleeding.

Uterine Cancer

Eleven patients were diagnosed with uterine cancer. The most common causes were uterine bleeding and myoma. In two cases, the fallopian tubes and ovaries were also affected. Endocervix involvement was the most frequently reported condition, observed in five cases, while the right uterine adnexa were affected in three cases. Lower endometrial cancer was identified in one patient, and bilateral adnexa involvement was found in another case. Pathologically, endometrioid adenocarcinoma was the most common type of uterine cancer.

Blood Cancer

Anemia was the most common symptom of blood cancer, occurring in three cases, with osteoporosis present in one of them. Thrombocytopenia with vaginal bleeding was reported in a 38-year-old female patient. Additionally, leukocytosis was identified as the primary complaint in one patient.

Breast Cancer

Breast cancer was among the most prevalent types of cancer in the study, accounting for 123 out of 668 cases. Among these, six patients had cancer in both breasts. The left breast was more frequently affected. Samples included needle biopsy specimens and cases referred to the laboratory following total or partial mastectomy. In nine patients, lymph nodes were involved, whereas fifteen patients had no skin or nipple involvement. The most common type of breast cancer was invasive ductal carcinoma, occurring in 81 cases. Other reported types included tubular carcinoma, papillary carcinoma, and medullary carcinoma.

Ovarian Cancer

Among 16 ovarian cancer patients, two cases were metastatic. The most common complaint was abdominal pain, although uterine bleeding was also reported. Tumors appeared as solid masses, and in some cases, they were multilocular (multi-cystic). In certain patients, the tumor was adherent to the pelvis. One case of immature teratoma, a neoplasm found in fewer than 1% of ovarian tumors, was observed. Pathologically, high-grade papillary carcinomas and malignant adenocarcinoma cysts were reported. Surgical intervention and ovarian removal were the most commonly performed treatment approaches at this center.

Thyroid Cancer

The analysis of thyroid cancer patients revealed that papillary carcinoma, with 16 cases, was the most common type. Additionally, two cases of minimally invasive follicular carcinoma, one case of papillary microcarcinoma, one case of squamous cell carcinoma, and two cases with capsular invasion were reported. One case of follicular neoplasm and one case of vascular invasion were also documented.

Regarding primary complaints, 13 patients presented with a neck mass, while one patient had a history of multinodular goiter. Metastasis was observed in six cases. Rare symptoms such as polyuria and bone pain were also reported.

Testicular Cancer

Among nine testicular cancer patients, five underwent right testicle removal, while four had left testicle removal. In two cases, the spermatic cord was involved, and in one case, capsular invasion of the testicle was observed.

Cervical Cancer

The analysis showed that only six patients were diagnosed with cervical cancer, indicating a low prevalence. Involvement was observed in the cervical lymph nodes, adipose tissues, or both. For treatment, three patients underwent cervical lymphadenectomy.

Discussion

Global statistics indicate that despite advancements in cancer diagnosis, prognosis, and treatment, the incidence of the disease continues to rise. Epidemiological data, risk factors, and scientific findings from past decades may not be entirely applicable to current trends due to significant changes in lifestyle, environmental pollution, and other risk factors over recent years.

The results of this study revealed that the average age of cancer onset in women is lower than in men. Analyzing the average age across different cancer types showed that female-specific cancers tend to occur at younger ages, whereas male-specific cancers develop later in life. For instance, the average age of prostate cancer onset is more than twice that of cervical cancer. Additionally, breast and ovarian cancers typically occur before age 50, whereas uterine cancer has an average onset age of 57. According to Arbyn et al., cervical cancer is diagnosed

at an average age of less than 45 years (6), while ovarian cancer is typically diagnosed at 63 years (7). Zahed et al. reported that cancer incidence in Iran occurs at younger ages, approximately 40 years (8). Meanwhile, studies indicate that prostate cancer is an age-dependent malignancy, generally occurring at 68 years and older (9).

Another finding of this study concerns hospital admission rates. Cumulative data indicate that most hospitalizations occurred between 2021 and 2022, a trend potentially linked to the COVID-19 pandemic, which lasted from 2019 to 2023. Although some studies suggest that the 2019 coronavirus outbreak may have contributed to cancer incidence, the twofold increase in hospitalizations in 2022 cannot be solely attributed to this factor (10). Global studies indicate that the COVID-19 pandemic caused delays in cancer care and management, which was also observed in Iran. Consequently, the increase in hospitalizations in 2021–2022 may not reflect a rise in cancer incidence but rather a delay in patient care and an influx of cases following mass vaccination efforts (11).

The most common cancers identified in this study were prostate, skin, stomach, and lung cancers. According to Schwartz et al., in high-income countries, the five most common cancers are lung, colorectal, breast, melanoma, and prostate cancer—two of which overlap with our findings (12). Taheri et al. reported that the most common cancers among men and women in Iran differ: in women, the most frequent cancers were breast, thyroid, colorectal, leukemia, and uterine cancer, whereas in men, they were prostate, colorectal, bladder, leukemia, and testicular cancer (13). Farhoud et al. compared cancer incidence in Iran with other countries and reported different statistics (14). Overall, existing data do not show complete correlation, underscoring the need for controlled epidemiological studies and precise data recording.

Cancer incidence was highest in older age groups, particularly between 50 and 70 years, with a male-to-female ratio of approximately 2:1. This difference could be attributed to genetic factors, risk factors like hypertension and obesity, lifestyle, and female sex hormones. According to Rampersau et al., in individuals under 59 years old, women tend to present with less advanced kidney tumors, resulting in a 19% lower risk of kidney carcinoma-related death compared to men.

Conclusion

This study provides insight into the pathological distribution and clinical characteristics of various cancers, highlighting common diagnostic patterns and symptoms in West Azerbaijan of Iran. The results of this study demonstrate that cancer patterns, primary complaints, laboratory findings, and pathology reports share both similarities and differences with international cancer trends. These variations may be due to geographical, cultural, social, or healthcare system differences affecting cancer development and diagnosis. In addition, it should be noted that this single-center study cannot provide a comprehensive picture of cancer statistics in the province, though it offers valuable insights into the current conditions

Acknowledgments

With utmost respect and gratitude, we sincerely thank the staff of Milad Hospital in Urmia for their unwavering support and cooperation in successfully conducting this research project. Their dedication and teamwork played an essential role in achieving our research goals. Without their contributions, this study would not have been possible. We truly appreciate their efforts and look forward to future fruitful collaborations.

Funding

This study was funded by the Islamic Azad University, Urmia Branch.

Conflict of Interest

The authors declare no conflicts of interest.

References

1. Andrade de Oliveira K, Sengupta S, Yadav AK, Clarke R. The complex nature of heterogeneity and its roles in breast cancer biology and therapeutic responsiveness. Front Endocrinol. 2023;14:1083048. https://doi.org/10.3389/fendo.2023.1083048
2. Rathmell WK. Using the national cancer plan to drive innovation in cancer research. Cancer Discov. 2024;14(4):555-8. https://doi.org/10.1158/2159-8290.CD-24-0223
3. Kim HI, Lim H, Moon A. Sex differences in cancer: epidemiology, genetics and therapy. Biomol Ther. 2018;26(4):335-42. https://doi.org/10.4062/biomolther.2018.103
4. Danaei M, Haghdoost A, Momeni M. An epidemiological review of common cancers in Iran; a review article. Iran J Blood Cancer. 2019;11(3):77-84.
5. Gretzer MB, Partin AW. PSA levels and the probability of prostate cancer on biopsy. Eur Urol Suppl. 2002;1(6):21-7. https://doi.org/10.1016/S1569-9056(02)00053-2
6. Arbyn M, Weiderpass E, Bruni L, de Sanjosé S, Saraiya M, Ferlay J, et al. Estimates of incidence and mortality of cervical cancer in 2018: a worldwide analysis. Lancet Glob Health. 2020;8(2):e191-203. https://doi.org/10.1016/S2214-109X(19)30482-6
7. Ali AT, Al-Ani O, Al-Ani F. Epidemiology and risk factors for ovarian cancer. Prz Menopauzalny. 2023;22(2):93-104. https://doi.org/10.5114/pm.2023.128661
8. Zahed H, Feng X, Sheikh M, Bray F, Ferlay J, Ginsburg O, et al. Age at diagnosis for lung, colon, breast and prostate cancers: an international comparative study. Int J Cancer. 2024;154(1):28-40. https://doi.org/10.1002/ijc.34671

9. Gupta S, Gupta A, Saini AK, Majumder K, Sinha K, Chahal A. Prostate cancer: how young is too young? Curr Urol. 2015;9(4):212-5. https://doi.org/10.1159/000447143
10. Jahankhani K, Ahangari F, Adcock IM, Mortaz E. Possible cancer-causing capacity of COVID-19: Is SARS-CoV-2 an oncogenic agent? Biochimie. 2023;213:130-8. https://doi.org/10.1016/j.biochi.2023.05.014
11. Keim-Malpass J, Vavolizza RD, Cohn WF, Kennedy EM, Showalter SL. Cancer screening and treatment delays during the COVID-19 pandemic and the role of health literacy in care re-engagement: findings from an NCI-designated comprehensive cancer center sample. J Cancer Educ. 2023;38(5):1405-12. https://doi.org/10.1007/s13187-023-02312-w
12. Schwartz SM. Epidemiology of cancer. Clin Chem. 2024;70(1):140-9. https://doi.org/10.1093/clinchem/hvad202
13. Taheri Soodejani M. Five common cancers in Iran in 2019: secondary analysis to discovering cluster of cancers. J Prim Care Community Health. 2023;14:21501319231186923. https://doi.org/10.1177/21501319231186923
14. Farhood B, Geraily G, Alizadeh A. Incidence and mortality of various cancers in Iran and compare to other countries: a review article. Iran J Public Health. 2018;47(3):309.