FIVE-YEAR SURVIVAL OF CERVICAL CANCER IN WOMEN TREATED AT A SECONDARY-LEVEL HOSPITAL.

Abstract:

Background: Cervical cancer (CC) is one of the most prevalent malignant neoplasms and has a significant impact on global public health, particularly in low- and middle-income regions. Survival among patients with cervical cancer is a critical indicator that reflects not only the effectiveness of clinical interventions but also the strength of healthcare systems and equity in access to care. Understanding the factors that influence survival is essential for designing more effective public health strategies and cancer control programs. The main global risk factors for cervical cancer include persistent infection with high-risk oncogenic human papillomavirus (HPV), early onset of sexual activity, multiple sexual partners, smoking, immunosuppression (especially HIV infection), and prolonged use of oral contraceptives.

Objective: To analyze cervical cancer survival among women treated at a secondary-level hospital.

Materials and Methods: A retrospective cohort study with time-to-event analysis was conducted at the Regional General Hospital No. 1 in Orizaba, Veracruz. The study population consisted of patients who attended outpatient consultations with a diagnosis of cervical cancer at this institution. Frequencies, proportions, and measures of central tendency were calculated for descriptive statistics. Overall survival according to the variables of interest was estimated using the Kaplan–Meier method with 95%

confidence intervals. Statistical analysis and graphical representation were performed using SPSS version 24.

Results: A total of 199 medical records of confirmed cervical cancer cases treated at the Regional General Hospital No. 1 in Orizaba, Veracruz, between January 1, 2019, and December 31, 2024, were included. Survival analysis of women diagnosed with cervical cancer was performed using the Kaplan–Meier method. The overall survival rate of women with cervical cancer treated at this secondary-level hospital was 86.9%. A progressive decline in survival was observed throughout the follow-up period, with the greatest concentration of decreases occurring between 40 and 65 months.

Conclusions: This survival study conducted in patients with cervical cancer demonstrated variations in five-year survival according to clinical stage at diagnosis, histological type, and treatment received. Patients diagnosed at early stages showed higher survival probabilities compared with those diagnosed at advanced stages of the disease, as well as compared with patients who received incomplete therapeutic regimens or did not receive timely oncological treatment.

Key words:-
Cervical cancer, survival.

Introduction:

Cervical cancer (CC) is a highly prevalent disease and represents a major global public health concern, particularly in low- and resource-limited settings. The disease begins with the neoplastic transformation of cervical epithelial cells. The primary etiological agent is the Human Papillomavirus (HPV), which constitutes the main risk factor for its development. Despite advances in primary prevention through HPV vaccination and secondary prevention through early detection and screening programs, cervical cancer remains a leading cause of morbidity and mortality among women worldwide. [1–2]

Regarding incidence, GLOBOCAN reported 662,301 new cases and 348,874 deaths worldwide in 2022. Health outcomes and well-being are strongly influenced by access to healthcare services as well as socioeconomic conditions. GLOBOCAN projections through 2030 highlight increasing disparities affecting women with this disease. Countries with a low Human Development Index (HDI) have reported incidence rates twice as high and mortality rates five times greater than those observed in countries with a very high HDI. If current trends remain stable, the number of new cases is projected to increase by 14.84% (760,082 cases), while deaths are expected to rise by 17.8% (411,035 deaths) by 2030, underscoring the urgent need to address these inequalities. [3]

These figures reveal marked geographic disparities, with disproportionately high incidence and mortality rates in low-resource countries, where approximately 90% of cervical cancer-related deaths occur. Such disparities reflect limitations in access to HPV vaccination, screening programs, and timely treatment, as well as the influence of underlying social and economic determinants of health. [4]

Survival assessment in oncology is a key component for understanding the natural history of a disease, evaluating the effectiveness of healthcare services, and measuring the impact of public health strategies. In cervical cancer, the proper interpretation of survival statistics requires a clear understanding of the concepts involved.

Five-year survival rate: This measure compares the survival of patients diagnosed with cancer with the expected survival of a similar population (matched by age, sex, and race) that does not have the disease. A relative five-year survival rate of 90% indicates that women with cervical cancer have a 90% likelihood of surviving for five years compared with individuals without cancer. This measure is useful because it adjusts for mortality from causes other than cancer and provides a more accurate estimate of the disease's impact on survival. [5]

Stage: The International Federation of Gynecology and Obstetrics (FIGO) established a clinical and pathological staging system for cervical cancer that is essential for determining prognosis and selecting the most appropriate treatment. This system classifies the extent of disease from Stage I (confined to the cervix) to Stage IV (spread to distant organs). Survival decreases as the disease stage advances, highlighting the importance of early detection and timely diagnosis. [6]

The survival of women with cervical cancer is an important indicator that reflects not only the effectiveness of medical care but also the strength of healthcare systems and equity in access to health services. Identifying the factors that influence survival is essential for the development of effective public health strategies. The main global risk factors for cervical cancer include HPV infection, early onset of sexual activity, multiple sexual partners, smoking, immunosuppression (particularly HIV infection), and prolonged use of oral contraceptives. [7]

In 2020, the age-standardized incidence rate of cervical cancer was 13.3 cases per 100,000 women per year, with a mortality rate of 7.2 deaths per 100,000 women annually. However, these rates vary considerably across regions. For example, in 2020 the incidence rate ranged from 2.2 cases per 100,000 women in Iraq to 84.6 cases per 100,000 women in Eswatini. Similarly, mortality rates ranged from 1.0 death per 100,000 women in Switzerland to 55.7 deaths per 100,000 women in Eswatini. [8]

Trends in cervical cancer incidence and mortality reflect the impact of preventive strategies. In many high-income countries, the implementation of cervical cytology-based screening programs and, more recently, HPV testing has led to substantial reductions in both incidence and mortality rates. Conversely, in low-resource countries, limited access to these preventive measures has hindered comparable reductions in disease burden. [9]

Cervical cancer survival rates vary according to geographic region and level of development. In Asia, a systematic review and meta-analysis reported 1-, 3-, 5-, and 10-year survival rates of 76.62%, 68.77%, 62.34%, and 61.60%, respectively, demonstrating an overall improvement in survival over time. The study also identified disease stage at diagnosis as one of the most important prognostic factors and found that the absence of cervical screening and inequalities in healthcare access were associated with lower survival rates in developing countries. [10]

In Sub-Saharan Africa, survival rates are substantially lower than global averages. A study published in 2024 reported 1-, 2-, 3-, 4-, and 5-year survival rates of 65.0%, 60.0%, 48.0%, 42.9%, and 35.0%, respectively. These findings highlight the significant challenges associated with cervical cancer management in this region, including under-resourced healthcare systems, limited access to diagnosis and treatment, and a high prevalence of risk factors such as immunosuppression. The marked differences in survival rates emphasize the need for global and national strategies aimed at strengthening preventive measures, promoting early diagnosis, and improving access to effective treatment for vulnerable populations. [11]

In the Region of the Americas, the epidemiological profile of cervical cancer reflects global trends while also revealing important regional disparities. Although cervical cancer is largely preventable and highly treatable when detected early, it remains a major public health concern, particularly in Latin America and the Caribbean. According to the Pan American Health Organization (PAHO), more than 78,000 women were diagnosed with cervical cancer and over 40,000 died from the disease in the Americas in 2022. These figures underscore the considerable burden of cervical cancer across the region. Notably, mortality rates in Latin America and the Caribbean are approximately three times higher than those observed in North America, highlighting persistent inequalities in healthcare access and outcomes throughout the region. [12]

Incidence and mortality rates of cervical cancer in the United States have declined substantially over recent decades, largely due to the implementation of organized screening programs and widespread HPV vaccination. [13]

It is estimated that in 2025 there will be approximately 2,041,910 new cancer cases and 618,120 cancer-related deaths in the United States. For cervical cancer, the overall five-year survival rate is estimated at 67%; however, significant disparities persist among population groups, with a five-year survival rate of approximately 58% among African American women. [14]

The persistence of high mortality rates in certain regions of Mexico has been attributed to multiple factors. Limited access to healthcare services, low awareness of the disease, insufficient participation in screening programs, and socioeconomic inequalities are among the most relevant determinants. A study conducted in 2024 examining sociodemographic characteristics and their relationship with cervical cancer outcomes in Mexico did not provide specific survival estimates; nevertheless, it emphasized that the highest incidence and mortality rates occur in resource-limited settings, a finding that is particularly relevant to the Mexican context. Late diagnosis remains a common challenge, as many women are diagnosed at advanced stages of the disease, reducing the likelihood of successful treatment and long-term survival.

Timely diagnosis of cervical cancer is essential for improving survival and reducing disease-related mortality. The diagnostic process includes population-based screening strategies, confirmatory testing, and disease staging procedures, all of which are crucial for determining disease extent and guiding appropriate therapeutic management. [15]

Recent advances in cervical cancer detection have transformed the diagnostic approach by prioritizing greater sensitivity and specificity. Screening tests are designed to identify precancerous lesions or early-stage cancer in asymptomatic women. Cervical cytology has long been considered the standard screening method and has contributed significantly to reductions in cervical cancer incidence and mortality in countries with established screening programs. However, its limited sensitivity, along with variability in sample collection and interpretation, has prompted the development of more reliable screening methods. [16]

Currently, HPV testing is recommended as a primary screening method in several international guidelines. This test detects the presence of DNA from high-risk HPV genotypes, which are the principal etiological agents of cervical cancer. Screening with HPV testing is generally recommended every five years for women within the target screening age range. [17–18]

A more recent strategy aimed at increasing screening coverage among populations with limited access to healthcare services is HPV self-sampling. This approach has shown promise in improving participation rates and facilitating early detection in underserved communities. [19]

When an abnormal screening result is identified, such as an abnormal cervical cytology result or a positive HPV test, additional confirmatory diagnostic procedures are required.

Colposcopy: Colposcopy is a visual examination of the vulva and cervix performed using a colposcope, which allows enhanced visualization of cervical structures. This procedure enables

clinicians to identify abnormalities that may not be visible to the naked eye. During the examination, acetic acid and Lugol's iodine solution are applied to highlight suspicious lesions.

Biopsy: If suspicious lesions are identified during colposcopy, a tissue sample should be obtained for histopathological evaluation. Histological examination determines the tumor subtype and degree of differentiation, providing essential information for establishing an accurate diagnosis. [20]

At the same time, research in cervical cancer diagnostics continues to expand, focusing on improving both accuracy and accessibility. Emerging molecular biomarkers are being investigated to identify women at higher risk of developing cervical cancer or experiencing disease recurrence, thereby supporting more personalized prevention and management strategies. [21]

The management of cervical cancer is multidisciplinary and individualized according to each patient's disease stage, histological subtype, and overall health status. Advances in treatment have significantly improved survival outcomes, particularly among patients diagnosed at early stages. The main treatment modalities include surgery, radiotherapy, chemotherapy, targeted therapies, and immunotherapy.

Surgery: For cervical cancer classified as FIGO stages IA1 to IIA, surgical management is generally considered the treatment of choice. Surgical procedures range from cervical conization to radical hysterectomy, often accompanied by pelvic lymphadenectomy. [22]

Radical trachelectomy: Radical trachelectomy, a fertility-sparing surgical procedure, may be an appropriate option for young patients with small, early-stage tumors who wish to preserve their reproductive potential and achieve future pregnancy. [23]

Radiotherapy: Radiotherapy uses ionizing radiation to destroy cancer cells and may be delivered as external beam radiotherapy (EBRT) or brachytherapy (internal radiation therapy). EBRT is directed to the pelvis to treat the primary tumor and regional lymph nodes, whereas brachytherapy delivers a high dose of radiation directly to the tumor site. Radiotherapy plays a central role in the management of locally advanced cervical cancer and may also be used as primary treatment or as adjuvant therapy following surgery. [24]

Chemotherapy: Chemotherapy employs cytotoxic agents to eliminate malignant cells. In cervical cancer, chemotherapy is frequently administered concurrently with radiotherapy (chemoradiotherapy) to enhance the therapeutic effects of radiation. Cisplatin remains the most commonly used chemotherapeutic agent in this setting. [25]

Targeted therapies and immunotherapy: Significant advances have recently been achieved in the treatment of advanced cervical cancer through the introduction of targeted therapies and immunotherapeutic agents. Immune checkpoint inhibitors, such as pembrolizumab, have demonstrated improved survival outcomes in patients with persistent, recurrent, or metastatic cervical cancer, particularly when combined with chemotherapy. [26–27] These therapies enhance the patient's immune response against tumor cells. In addition, angiogenesis inhibitors such as

bevacizumab are currently used in the management of advanced disease and have shown clinical benefits in selected patient populations. [28]

Post-treatment follow-up of patients diagnosed with cervical cancer is essential for the early detection of disease recurrence, management of long-term treatment-related adverse effects, and improvement of quality of life. A well-structured follow-up protocol allows for the timely identification of any signs of disease recurrence, thereby facilitating the implementation of therapeutic interventions that may improve survival outcomes.

Follow-up schedule: Follow-up visits are generally scheduled every 3 to 4 months during the first two years after treatment initiation. Thereafter, appointments are typically conducted every 6 to 12 months for the subsequent 3 to 5 years. After five years, follow-up may continue annually or be individualized according to the patient's clinical condition. [29]

The following assessments are generally recommended on an annual basis during the follow-up period:

Physical examination: A comprehensive physical evaluation, including a bimanual pelvic examination and inspection of the vagina and cervix, should be performed to detect and monitor any abnormalities suggestive of disease recurrence.

Cervical cytology and HPV testing: These tests are used to identify abnormal cervical cells and/or persistent or recurrent HPV infection. Post-treatment HPV testing has been shown to be more sensitive than cervical cytology for detecting recurrent disease. [30]

Follow-up care should not be limited to disease surveillance alone but should also address the physical and psychological consequences of cervical cancer and its treatment. Patients may experience lymphedema, sexual dysfunction, gastrointestinal and urinary complications, as well as anxiety and emotional distress. Therefore, a multidisciplinary approach that incorporates psychological support, rehabilitation services, and effective pain management is essential for improving both quality of life and long-term survival. [31]

Failure to provide adequate follow-up for abnormal screening results or precancerous lesions may lead to unfavorable outcomes, including increased mortality. Consequently, ensuring timely, accurate, and accessible follow-up care is as important as the initial treatment itself in improving survival among patients with cervical cancer. [32]

Materials and Methods:

A retrospective cohort study with a time-to-event analysis was conducted at the Regional General Hospital No. 1 in Orizaba, Veracruz. The study population consisted of patients who attended medical consultation with a diagnosis of cervical cancer between January 1, 2019, and December 31, 2024, at this institution. Frequencies and proportions, as well as measures of central tendency, were calculated for the descriptive statistical analysis. Overall survival was estimated according to the variables of interest using the Kaplan–Meier method, with 95% confidence intervals.

The inclusion criterion for the study was the availability of medical records of women aged 25 years and older who received medical care at the Regional General Hospital No. 1 in Orizaba, Veracruz, had a histopathologically confirmed diagnosis of cervical cancer, and had documented follow-up in their clinical records. The exclusion criterion was medical records containing less than 80% of the required information. The elimination criterion included medical records of women who met the inclusion criteria but did not have follow-up information available in their clinical records.

Results:

A total of 199 medical records were included in the study, corresponding to histopathologically confirmed cases of cervical cancer diagnosed at the Hospital General Regional No. 1 in Orizaba, Veracruz, during the period from January 1, 2019, to December 31, 2024.

Survival Analysis

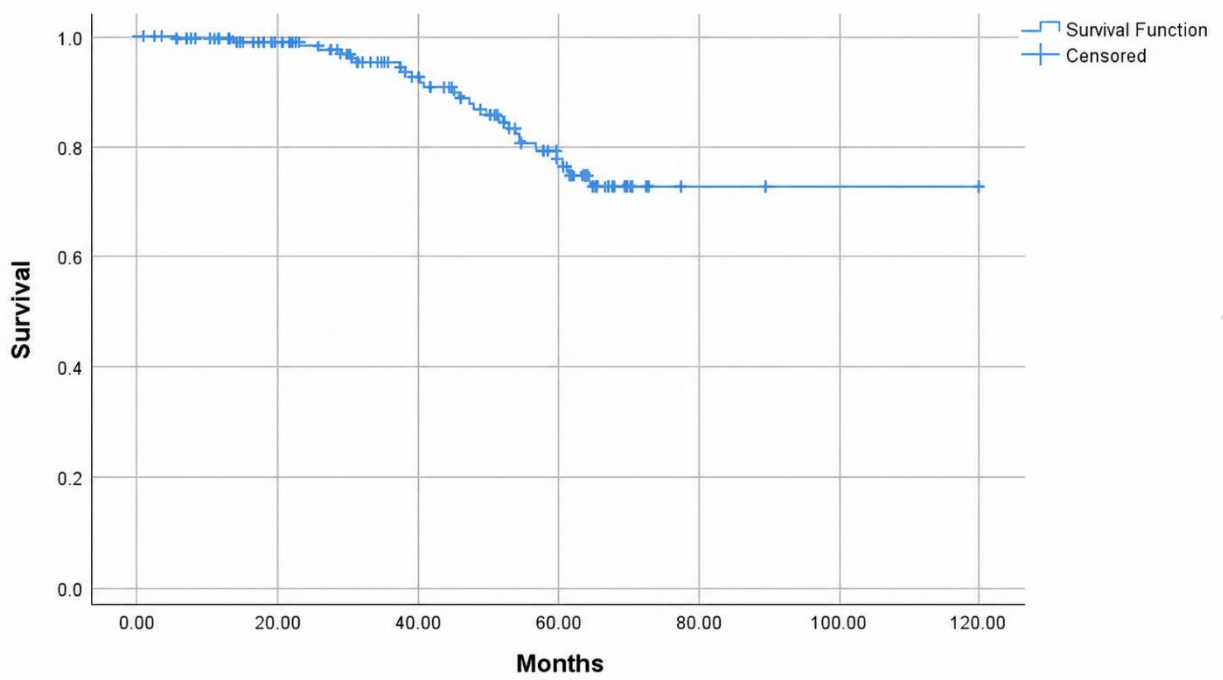
A survival analysis of women diagnosed with cervical cancer was performed using the Kaplan–Meier method. The mean survival time was 100.023 months, with a standard error of 3.419 months (Table 1). The 95% confidence interval ranged from 93.321 months (lower limit) to 106.725 months (upper limit). The overall survival rate of women diagnosed with cervical cancer and treated at a secondary-level hospital was 86.9%. A gradual decline in survival was observed throughout the follow-up period, with the greatest concentration of decreases occurring between 40 and 65 months.

Table 1. Mean Survival Time

Mean Survival Time	Standard Error	Lower Limit	Upper Limit
100.023	3.419	93.321	106.725

The overall mean survival time was 100.023 months.

Figure 1. Survival of Women Diagnosed with Cervical Cancer Treated at a Secondary-Level Hospital



The 5-year survival rate of women diagnosed with cervical cancer treated at the hospital was 86.9%.

It was observed that the 20–39 years age group had a mean survival time of 104.624 months, with a 95% confidence interval (CI) ranging from 90.983 to 118.266 months. The 40–59 years age group showed a mean survival time of 74.320 months, with a 95% CI of 68.221 to 80.420 months. In the ≥60 years age group, the mean survival time was 71.991 months, with a 95% CI ranging from 67.721 to 76.261 months (Table 2).

Table 2. Mean Survival Time by Age Group

Age	Mean Survival Time	Lower Limit	Upper Limit
20-39 years	104.624	90.983	118.266
40-59 years	74.320	68.221	80.420
> 60 years	71.991	67.721	76.261

Patients aged 20–39 years had the highest mean survival time.

In the 20–39 years age group, 45 patients were included, of whom 4 died, resulting in a 91.1% survival rate and a survival proportion of 22.61%. In the 40–59 years age group, 103 patients were included, with 16 deaths, yielding a survival rate of 84.5% and a survival proportion of 51.76%. In the ≥60 years age group, 51 patients were included, with 6 deaths, resulting in a survival rate of 88.2% and a survival proportion of 25.63%. No statistically significant differences in survival were observed among the age groups (Log-rank test, p = 0.240) (Table 3).

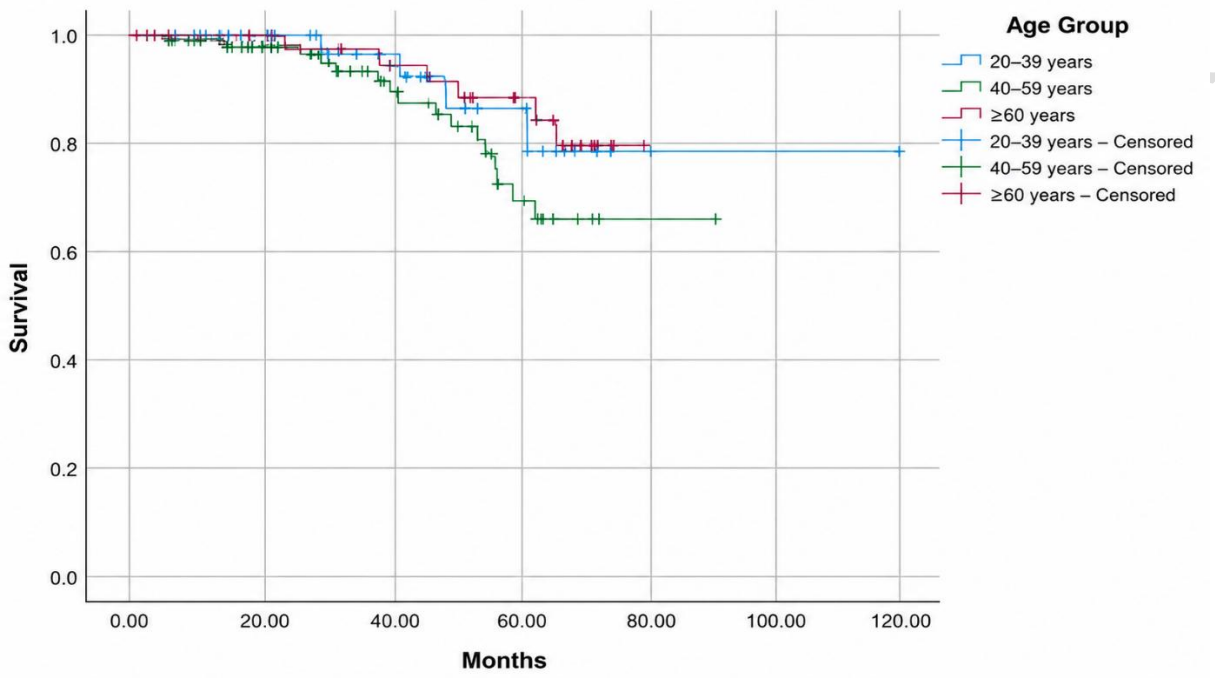
Table 3. Survival Rate and Survival Proportion by Age Group

Age	N	Deaths	Survival rate	Survival proportion

20-39 years	45	4	91.1%	22.61
40-59 years	103	16	84.5%	51.76
>60 years	51	6	88.2%	25.63

Patients aged 20–39 years exhibited the highest 5-year survival rate.

Figure 2. Survival of Women Diagnosed with Cervical Cancer by Age Group



The 5-year survival rate for women aged 20–39 years was 91.1%.

Survival analysis according to FIGO stage was performed using the Kaplan–Meier method. For Stage I, the mean survival time was 70.571 months, with a 95% confidence interval (CI) ranging from 68.533 to 72.610 months. For Stage II, the mean survival time was 76.518 months, with a 95% CI of 70.087 to 82.949 months. For Stage III, the mean survival time was 78.180 months, with a 95% CI ranging from 44.760 to 111.600 months. For Stage IV, the mean survival time was 58.480 months, with a 95% CI of 48.134 to 68.827 months (Table 4).

Table 4. Mean Survival Time by FIGO Stage

FIGO stage	Mean Survival Time	Lower Limit	Upper Limit
I	70.571	68.533	72.610
II	76.518	70.087	82.949
III	78.180	44.760	111.600
IV	58.480	48.134	68.827

FIGO Stage III exhibited the highest mean 5-year survival time.

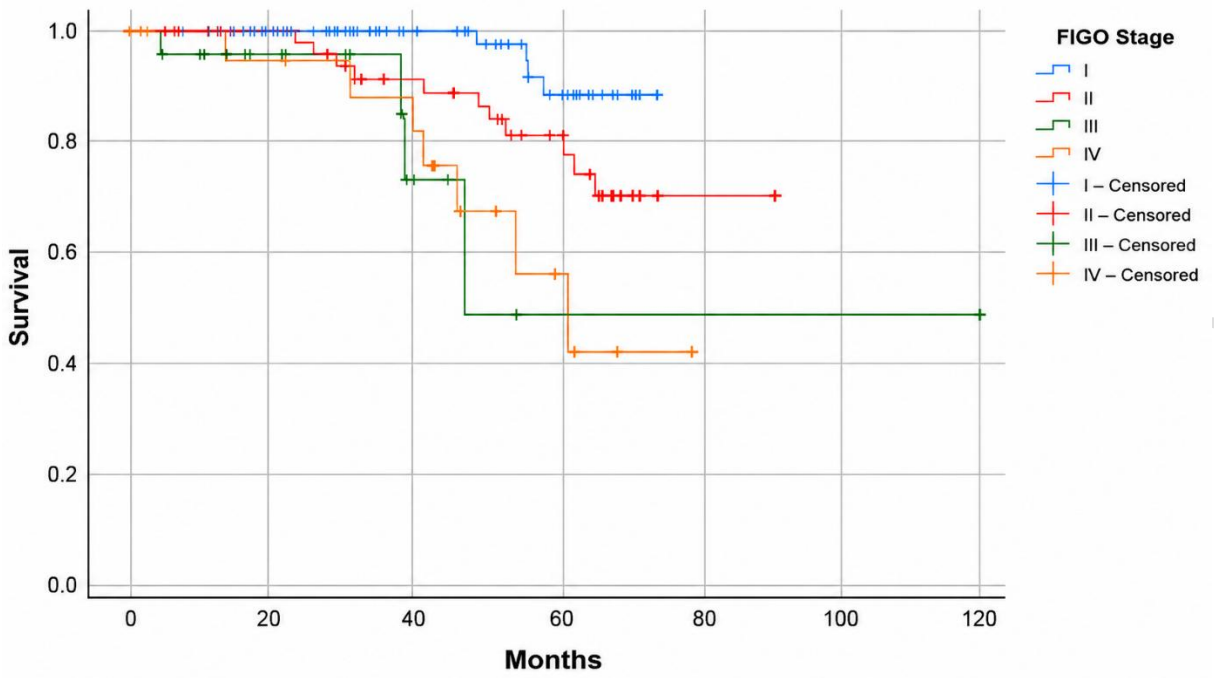
Furthermore, the 5-year survival rates according to FIGO clinical stage were 95.0% for Stage I, 80.4% for Stage II, 83.3% for Stage III, and 65.0% for Stage IV. Statistically significant differences in survival were observed among the FIGO stages (Log-rank test, $p < 0.001$) (Table 5).

Table 5. Survival Rate and Survival Proportion by FIGO Stage

FIGO stage	N	Deaths	Survival rate	Survival proportion
I	98	4	95.9%	49.25
II	56	11	80.4%	28.14
III	24	4	83.3%	12.06
IV	20	7	65.0%	10.05

Patients with FIGO Stage I had the highest 5-year survival rate.

Figure 3. Survival of Women Diagnosed with Cervical Cancer by FIGO Stage



The 5-year survival rate for patients with FIGO Stage I cervical cancer was 95.9%.

It was observed that epidermoid carcinoma had a mean survival time of 97.497 months, with a 95% confidence interval (CI) ranging from 88.779 to 106.215 months. Adenocarcinoma showed a mean survival time of 73.270 months, with a 95% CI of 68.711 to 77.830 months. Clear cell carcinoma had a mean survival time of 62.270 months, with a 95% CI ranging from 50.428 to 74.112 months. Leiomyosarcoma presented a mean survival time of 61.030 months, with a 95% CI of 60.337 to 61.723 months. Undifferentiated tumors showed a mean survival time of 63.482 months, with a 95% CI ranging from 54.981 to 71.983 months (Table 6).

Table 6. Mean Survival Time by Histological Type

Histological Type	Mean Survival Time	Lower Limit	Upper Limit
Epidermoid carcinoma	97.497	88.779	106.215
Adenocarcinoma	73.270	68.711	77.830
Clear Cell Carcinoma	62.270	50.428	74.112
Leiomyosarcoma	61.030	60.337	61.723
Undifferentiated Tumors	63.482	54.981	71.983

Epidermoid carcinoma exhibited the highest mean 5-year survival time.

Likewise, the Epidermoid carcinoma group included 140 patients, with 19 deaths, resulting in a survival rate of 86.4% and a survival proportion of 70.35%. The adenocarcinoma group included 43 patients, with 3 deaths, yielding a survival rate of 93.0% and a survival proportion of 21.61%. The clear cell carcinoma group included 3 patients, with 1 death, resulting in a survival rate of 66.7% and a survival proportion of 1.51%. The leiomyosarcoma group included 2 patients, with 1 death, yielding a survival rate of 50.0% and a survival proportion of 1.01%. Undifferentiated

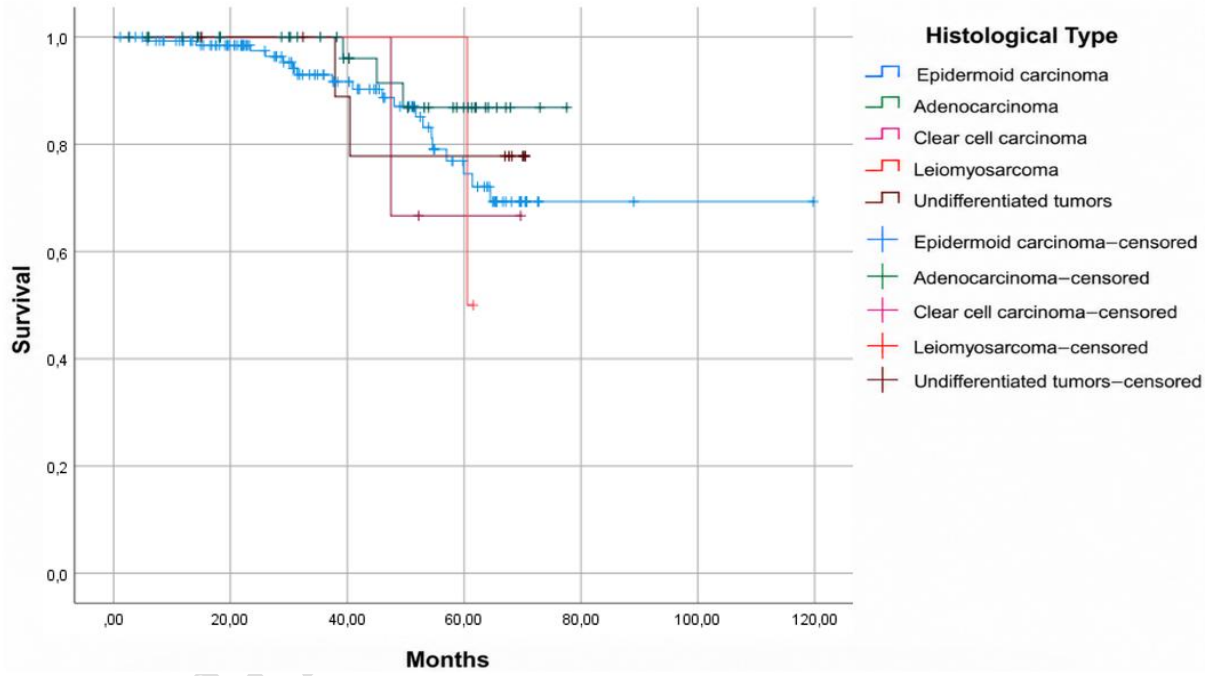
tumors included 11 patients, with 2 deaths, resulting in a survival rate of 81.8% and a survival proportion of 5.53%. No statistically significant differences in survival were observed among the histological types (Log-rank test, p = 0.685) (Table 7).

Table 7. Survival rate and survival proportion by histological type

Histological Type	N	Deaths	Survival rate	Survival proportion
Epidermoid carcinoma	140	19	86.4%	70.35
Adenocarcinoma	43	3	93.0%	21.61
Clear Cell Carcinoma	3	1	66.7%	1.51
Leiomyosarcoma	2	1	50.0%	1.01
Undifferentiated Tumors	11	2	81.8%	5.53

Patients with adenocarcinoma had the highest 5-year survival rate.

Figure 4. Survival of Women Diagnosed with Cervical Cancer by Histological Type.



The 5-year survival rate for patients with the adenocarcinoma histological type was 93.0%.

The mean survival time according to a history of HPV infection was estimated using the Kaplan–Meier method. In the group with a history of HPV infection, the mean survival time was 67.486 months, with a 95% confidence interval (CI) ranging from 62.569 to 72.404 months. In the group without a history of HPV infection, the mean survival time was 100.133 months, with a 95% CI of 93.050 to 107.215 months (Table 8).

Table 8. Mean survival time according to history of HPV infection

History of HPV infection	Mean Survival Time	Lower Limit	Upper Limit
Yes	67.486	62.569	72.404
No	100.133	93.050	107.215

Patients without a history of HPV infection had a higher mean survival time than those with a history of HPV infection.

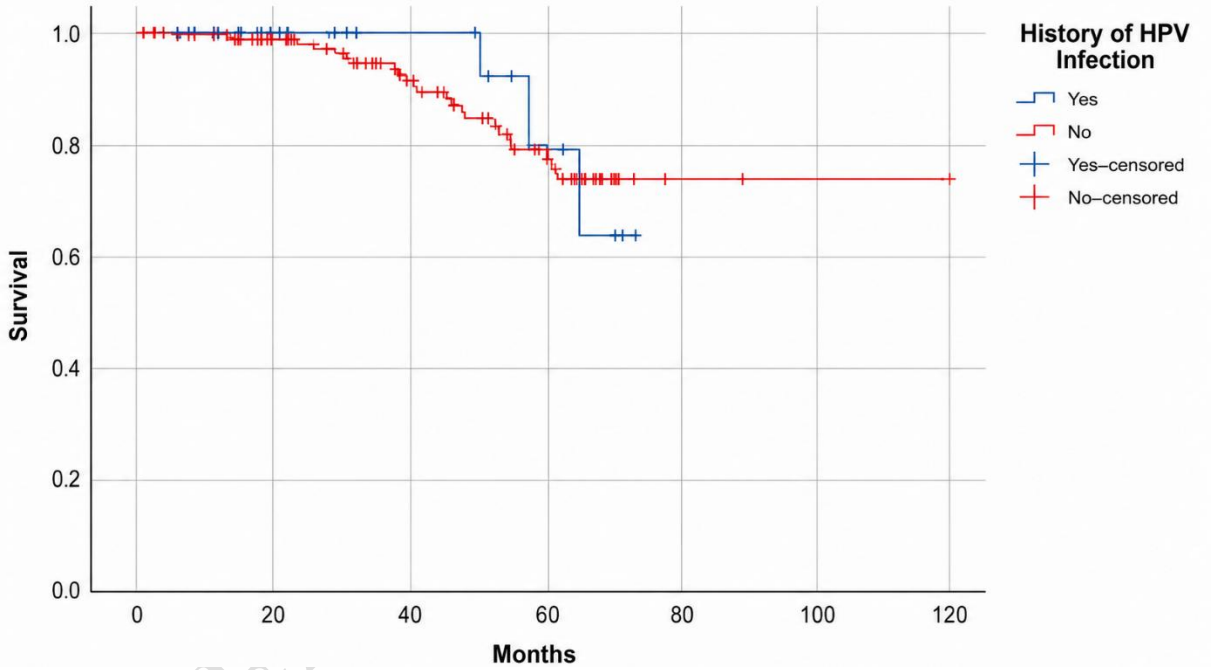
The 5-year survival rate was 91.4% among patients with a history of HPV infection and 85.9% among those without a history of HPV infection. No statistically significant difference in survival was observed between the two groups (Log-rank test, p = 0.737) (Table 9).

Table 9. Survival Rate and Survival Proportion According to History of HPV Infection

History of HPV infection	N	Deaths	Survival rate	Survival proportion
Yes	35	3	91.4%	17.59
No	163	23	85.9%	81.91

Patients without a history of HPV infection had a higher survival proportion than those with a history of HPV infection.

Figure 5. Survival of women diagnosed with cervical cancer cccording to history of HPV infection



The 5-year survival rate for patients with a history of HPV infection was 91.4%.

Survival analysis was performed according to treatment type, estimating the mean survival time and its 95% confidence interval (CI). The adjuvant treatment group had a mean survival time of 70.239 months, with a standard error of 0.963 and a 95% CI ranging from 68.351 to 72.126 months. The neoadjuvant treatment group showed a mean survival time of 93.319 months, with a standard error of 5.690 and a 95% CI of 82.166 to 104.472 months. In the no treatment group, the mean survival time was 49.047 months, with a standard error of 5.614 and a 95% CI ranging from 38.043 to 60.050 months (Table 10).

Table 10. Mean survival time by Treatment type

Treatment type	Mean Survival Time	Lower Limit	Upper Limit

Neoadjuvant treatment	93.319	82.166	104.472
Adjuvant treatment	70.239	68.351	72.126
No treatment	49.047	38.043	60.050

Patients who received neoadjuvant therapy had the highest mean survival time among the treatment groups.

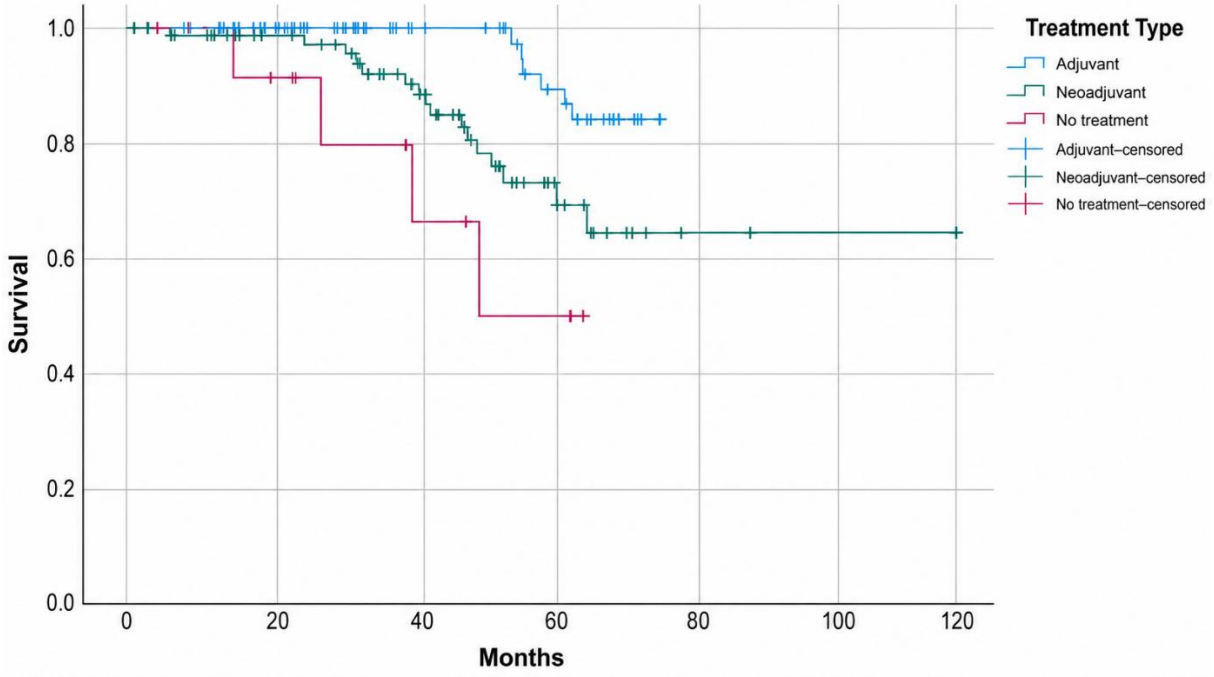
Regarding the distribution of patients and deaths, the adjuvant treatment group included 101 patients, of whom 6 died, resulting in a 94.1% survival rate and a survival proportion of 50.75%. The neoadjuvant treatment group consisted of 83 patients, with 16 deaths, yielding a survival rate of 80.7% and a survival proportion of 41.71%. The no treatment group included 14 patients, with 4 deaths, resulting in a 71.4% survival rate and a survival proportion of 7.04%. Statistically significant differences in survival were observed among the treatment groups (Log-rank test, p = 0.002) (Table 11).

Table 11. Survival rate and survival proportion by treatment type

Treatment type	N	Deaths	Survival rate	Survival proportion
Neoadjuvant treatment	83	16	80.7%	41.71
Adjuvant treatment	101	6	94.1%	50.75
No treatment	14	4	71.4%	7.04

Patients who did not receive treatment had the lowest survival proportion among the treatment groups.

Figure 6. Survival of Women Diagnosed with Cervical Cancer by Treatment Type



The 5-year survival rate for women who did not receive treatment was 71.4%.

DISCUSSION:

Terán-Figueroa and colleagues conducted a survival study of cervical cancer among beneficiaries of the Seguro Popular at Hospital Central Dr. Ignacio Morones Prieto in San Luis Potosí, Mexico, including 368 patients with cervical cancer. They reported an overall 5-year survival rate of 82%[33]. In the present study, conducted among 199 patients treated at Hospital General Regional No. 1 in Orizaba, the 5-year survival rate was 86.9%.

In a 2022 time-to-event study of women diagnosed with cervical cancer, Terreglosa Hernández et al. evaluated patients whose treatment was financed by the Seguro Popular through the Fund for Protection Against Catastrophic Expenditures during the period 2006–2014. Survival according to clinical stage was 88.0% for early-stage disease, 63.9% for locoregional disease, and 43.6% for metastatic disease[34]. In the present study, the 5-year survival rates by FIGO stage were 95.0% for Stage I (tumor confined to the uterus), 80.4% for Stage II (cervical involvement), 83.3% for Stage III (extrauterine extension), and 65.0% for Stage IV (metastatic disease).

Sancho Pedro Xavier and colleagues conducted a survival study and analysis of its predictors in the Mato Grosso region of Brazil from 2011 to 2023. They found that patients aged 16–39 years had the highest survival (94.4%), whereas survival progressively declined with increasing age, reaching the lowest value among women older than 60 years (83.9%)[35]. Similarly, in the present study, the 20–39 years age group had a 5-year survival rate of 91.1%, whereas women older than 60 years had a survival rate of 88.2%.

Xingxi Pan and colleagues conducted a study in Nanhai, China, using data from the Surveillance, Epidemiology, and End Results (SEER) database to evaluate survival among patients diagnosed with cervical cancer between 1998 and 2016. The study included 33,148 patients, of whom 24,591 (74.19%) had squamous cell carcinoma and 8,557 (25.81%) had adenocarcinoma. They reported a 5-year survival rate of 74.37% for patients with adenocarcinoma and 64.07% for those with squamous cell carcinoma[36]. In the present study, patients with adenocarcinoma had a 5-year survival rate of 93.0%, those with epidermoid carcinoma had a survival rate of 86.4%, and patients with undifferentiated tumors had a survival rate of 81.8%.

In a cervical cancer study conducted by Millán Aguilar and colleagues at the Centro Médico Nacional 20 de Noviembre, which included 197 patients, the most commonly administered treatment was radiotherapy, achieving a median survival of 35 months, while surgery followed by adjuvant radiotherapy did not reach the median survival time[37]. In the present study, the adjuvant treatment group had a mean survival time of 70.239 months, the neoadjuvant treatment group had a mean survival time of 93.319 months, and the no treatment group had a mean survival time of 49.047 months.

Conclusion:

The present survival study conducted among patients with cervical cancer demonstrated variations in 5-year survival according to the clinical stage at diagnosis, histological type, and treatment received. Patients diagnosed at early stages exhibited higher probabilities of survival compared with those diagnosed at advanced stages of the disease, as well as with patients who received incomplete therapeutic regimens or did not receive timely oncologic treatment.

The findings identified important opportunities for improvement in early detection, timely referral, and adherence to treatment. These results provide relevant epidemiological evidence for the planning of prevention, clinical management, and follow-up strategies for cervical cancer, with the aim of improving survival and reducing mortality among the population served by Hospital General Regional No. 1, Orizaba, Veracruz.

References:

1) Cervical cancer [Internet]. Who.int. Available from: https://www.who.int/news-room/fact-sheets/detail/cervical-cancer
2) Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2021;71(3):209–49. Available from: http://dx.doi.org/10.3322/caac.21660
3) Li Z, Liu P, Yin A, Zhang B, Xu J, Chen Z, et al. Global landscape of cervical cancer incidence and mortality in 2022 and predictions to 2030: The urgent need to address inequalities in cervical cancer. Int J Cancer. 2025;157(2):288–97. Available from: http://dx.doi.org/10.1002/ijc.35369
4) Cervical cancer [Internet]. Paho.org. Available at: https://www.paho.org/en/topics/cervical-cancer
5) Cervical cancer survival rates [Internet]. Cancer.org. Available from: https://www.cancer.org/cancer/types/cervical-cancer/detection-diagnosis-staging/survival.html
6) Bhatla N, Aoki D, Sharma DN, Sankaranarayanan R. Cancer of the cervix uteri: 2021 update. Int J Gynaecol Obstet. 2021;155 Suppl 1(S1):28–44. Available from: http://dx.doi.org/10.1002/ijgo.13865
7) Comprehensive cervical cancer control: a guide to essential practice. Geneva: WHO; 2014.
8) Singh D, Vignat J, Lorenzoni V, Eslahi M, Ginsburg O, Lauby-Secretan B, et al. Global estimates of incidence and mortality of cervical cancer in 2020: a baseline analysis of the WHO Global Cervical Cancer Elimination Initiative. Lancet Glob Health. 2023;11(2):e197–206. Available from: http://dx.doi.org/10.1016/S2214-109X(22)00501-0
9) Schiffman M, Castle PE, Jeronimo J, Rodriguez AC, Wacholder S. Human papillomavirus and cervical cancer. Lancet. 2007 Sep 8;370(9590):890-907. doi: 10.1016/S0140-6736(07)61416-0. PMID: 17826171.
10) Vali M, Maleki Z, Nikbakht H-A, Hassanipour S, Kouhi A, Nazemi S, et al. Survival rate of cervical cancer in Asian countries: a systematic review and meta-analysis. BMC Womens Health [Internet]. 2023;23(1):671. Available from: http://dx.doi.org/10.1186/s12905-023-02829-8
11) Emagneneh T, Mulugeta C, Ejigu B, Alamrew A, Hiwot AY, Feleke SF. Survival status of women with cervical cancer in Sub-Saharan Africa: a systematic review and meta-analysis, 2024. Front Oncol [Internet]. 2024;14:1491840. Available from: http://dx.doi.org/10.3389/fonc.2024.1491840
12) Pan American Health Organization. Cervical cancer. Available from: https://www.paho.org/en/topics/cervical-cancer
13) Cervical cancer statistics [Internet]. Cancer.org. Available from: https://www.cancer.org/cancer/types/cervical-cancer/about/key-statistics.html
14) Siegel RL, Kratzer TB, Giaquinto AN, Sung H, Jemal A. Cancer statistics, 2025. CA Cancer J Clin. 2025; 75(1): 10-45. doi:10.3322/caac.21871
15) Cetina-Pérez L, Luvián-Morales J, Delgadillo-González M, Castro-Eguiluz D, Galicia-Carmona T, Rely K, et al. Sociodemographic characteristics and their association with survival in women with cervical cancer. BMC Cancer [Internet]. 2024;24(1):161. Disponible Available from: http://dx.doi.org/10.1186/s12885-024-11909-3

16) Fu Y, Esebua M. Three-year pap test quality assurance analysis in transition to implementation of 2012 American cancer society, American society for colposcopy and cervical pathology, and American society for clinical pathology screening guidelines for prevention and early detection of cervical cancer. J Am Soc Cytopathol [Internet]. 2014;3(5):S75–6. Available from: http://dx.doi.org/10.1016/j.jasc.2014.09.179
17) Updated cervical cancer screening guidelines [Internet]. Acog.org. Available from: https://www.acog.org/clinical/clinical-guidance/practice-advisory/articles/2021/04/updated-cervical-cancer-screening-guidelines
18) .World Health Organization. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. 2nd ed. Geneva: WHO; 2021.
19) Wentzensen N, Massad LS, Clarke MA, Garcia F, Smith R, Murphy J, et al. Self-collected vaginal specimens for HPV testing: Recommendations from the Enduring Consensus Cervical Cancer Screening and Management Guidelines Committee. J Low Genit Tract Dis [Internet]. 2025;29(2):144–52. Available from: http://dx.doi.org/10.1097/LGT.0000000000000885
20) Cervical cancer [Internet]. Mayoclinic.org. Available from: https://www.mayoclinic.org/diseases-conditions/cervical-cancer/diagnosis-treatment/drc-20352506
21) Ouh Y-T, Kim TJ, Ju W, Kim SW, Jeon S, Kim S-N, et al. Development and validation of artificial intelligence-based analysis software to support screening system of cervical intraepithelial neoplasia. Sci Rep [Internet]. 2024;14(1):1957. Available from: http://dx.doi.org/10.1038/s41598-024-51880-4
22) NCCN. Guidelines for Patients: Cervical Cancer. 2025. Available from: https://www.nccn.org/patients/guidelines/content/PDF/cervical-cancer-patient-guideline.pdf
23) Piver MS, Rutledge F, Smith JP. Five classes of extended hysterectomy for women with cervical cancer. Obstet Gynecol Surv [Internet]. 1975;30(3):220–3. Available from: http://dx.doi.org/10.1097/00006254-197503000-00027
24) Cervical cancer treatment (PDQ®) [Internet]. Cancer.gov. 2025. Available from: https://www.cancer.gov/types/cervical/hp/cervical-treatment-pdq
25) Ma JK, Allbright RM, Packianathan S, Harrell L, Chinchar E, Mourad WF, et al. The impact of total external beam radiation therapy and brachytherapy package duration on the outcome of cervical cancer treated with radiation alone or with concomitant chemotherapy. Int J Radiat Oncol Biol Phys [Internet]. 2014;90(1):S472. Available from: http://dx.doi.org/10.1016/j.ijrobp.2014.05.1467
26) Colombo N, Dubot C, Lorusso D, Caceres MV, Hasegawa K, Shapira-Frommer R, Tewari KS, Salman P, Hoyos Usta E, Yañez E, Gümüş M, Olivera Hurtado de Mendoza M, Samouëlian V, Castonguay V, Arkhipov A, Toker S, Li K, Keefe SM, Monk BJ; KEYNOTE-826 Investigators. Pembrolizumab for Persistent, Recurrent, or Metastatic Cervical Cancer. N Engl J Med. 2021 Nov 11;385(20):1856-1867. doi: 10.1056/NEJMoa2112435. Epub 2021 Sep 18. PMID: 34534429.
27) Li Z-R, Wang Y-F, Zuo C-R, Men J-S, Li X-Y, Luo P, et al. Unlocking the potential of immune checkpoint inhibitors in advanced cervical cancer: a meta-analysis and systematic review. BMC Cancer [Internet]. 2025;25(1):863. Available from: http://dx.doi.org/10.1186/s12885-025-14264-z
28) Tewari KS, Sill MW, Penson RT, Huang H, Ramondetta LM, Landrum LM, Oaknin A, Reid TJ, Leitao MM, Michael HE, DiSaia PJ, Copeland LJ, Creasman WT, Stehman FB, Brady MF, Burger RA, Thigpen JT, Birrer MJ, Waggoner SE, Moore DH, Look KY, Koh WJ, Monk BJ. Bevacizumab for advanced cervical cancer: final overall survival and adverse event analysis of a randomised, controlled, open-label, phase 3 trial (Gynecologic Oncology Group 240). Lancet. 2017 Oct 7;390(10103):1654-1663. doi: 10.1016/S0140-6736(17)31607-0. Epub 2017 Jul 27. PMID: 28756902; PMCID: PMC5714293.

29) Mohan, R.; Abdalla, M.; Koerling, A.-L.; Sathiyathasan, S. Beyond the Cure: Optimizing Follow-Up Care for Cervical Cancer Survivors. Reprod. Med. 2025, 6, 12. https://doi.org/10.3390/reprodmed6020012
30) Arbyn M, Ronco G, Anttila A, Meijer CJLM, Poljak M, Ogilvie G, et al. Evidence regarding human papillomavirus testing in secondary prevention of cervical cancer. Vaccine [Internet]. 2012;30 Suppl 5:F88-99. Available from: http://dx.doi.org/10.1016/j.vaccine.2012.06.095
31) Le Borgne G, Mercier M, Woronoff AS, Guizard AV, Abeilard E, Caravati-Jouvenceaux A, Klein D, Velten M, Joly F. Quality of life in long-term cervical cancer survivors: a population-based study. Gynecol Oncol. 2013 Apr;129(1):222-8. doi: 10.1016/j.ygyno.2012.12.033. Epub 2012 Dec 30. PMID: 23280088.
32) Martinez-Gutierrez J, Chima S, Boyd L, Sherwani A, Drosdowsky A, Karnchanachari N, Luong V, Reece JC, Emery J. Failure to follow up abnormal test results associated with cervical cancer in primary and ambulatory care: a systematic review. BMC Cancer. 2023 Jul 12;23(1):653. doi: 10.1186/s12885-023-11082-z. PMID: 37438686; PMCID: PMC10337158.
33) Teran-Figueroa Y, García-Diaz J, González-Rubio MV, Gaytán-Hernández D, Gutiérrez-Enríquez SO. Mortalidad y supervivencia por cáncer cervicouterino en beneficiarias del Seguro Popular en el estado de San Luis Potosí, México. Periodo 2005-2012. Acta Univ [Internet]. 2020;30:e2412. Available from: http://doi.org/10.15174/au.2020.2412
34) Torreglosa-Hernández S, Grisales-Romero H, Morales-Carmona E, Hernández-Ávila JE, Huerta-Gutiérrez R, Barquet-Muñoz SA, et al. Supervivencia y factores asociados en pacientes con cáncer cervicouterino atendidas por el Seguro Popular en México. Salud Publica Mex. 2022;64(1):76-86. Available from: https://doi.org/10.21149/13119.
35) Xavier SP, Silva KMS, Galvão ND, das Neves MAB, Almeida AQN, Silva AMC. Time to death from cervical cancer and its predictors in hospitalized patients: a survival approach study in Mato Grosso, Brazil. World J Surg Oncol [Internet]. 2024;22:269. Available from: https://doi.org/10.1186/s12957-024-03518-y.
36) Pan X, Yang W, Wen Z, Li F, Tong L, Tang W. Does adenocarcinoma have a worse prognosis than squamous cell carcinoma in patients with cervical cancer? A real-world study with a propensity score matching analysis. J Gynecol Oncol [Internet]. 2020 Nov;31(6):e80. Available from: https://doi.org/10.3802/jgo.2020.31.e80.
37) Millán-Aguilar HA, Cortés-Esteban P. Cáncer cervicouterino: actualización y análisis estadístico de pacientes tratadas en el Centro Médico Nacional 20 de Noviembre. Rev Esp Méd Quir [Internet]. 2020;25(1):37-43. Available from: https://www.remq-issste.com. DOI: 10.24875/REMQ.20000036.