Correlation of Histological Type, Stage, Age, and Prognosis in Uterine Cervical Cancer at Margono Soekardjo Hospital Purwokerto from January – December 2024

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Abstract

Objective: To evaluate the correlation of histological subtype, stage, age, and prognosis in cervical cancer patients treated at Prof. Dr. Margono Soekarjo Hospital, Purwokerto.

Methods: This is a retrospective descriptive cohort study conducted using medical records. Data on cervical cancer staging, age, and histopathological subtype were collected from all patients meeting the inclusion criteria. Statistical analysis was performed, and associations were examined using chi-square tests. The data used in the study were obtained from the medical records of patients at the research site from January to December 2024.

Result: Of 582 patients identified, 245 met the inclusion criteria. Squamous cell carcinoma (SCC) accounted for 147 cases, and adenocarcinoma (AC) for 98. Most patients were aged >50 years old and diagnosed at stage II. SCC was most common at stage II, while AC was most frequently found at stage III. Statistical analysis revealed a significant but weak association between age, stage, prognosis, and histological subtype.

Conclusion: There was a significant weak correlation of histological subtype and age, stage, and prognosis in cervical cancer.

Keywords: Cervical cancer, histological subtype, age, stage, prognosis

Korelasi Tipe Histologis, Stadium, Usia, dan Prognosis pada Kanker Uterin Serviks di Rumah Sakit Margono Soekardjo Purwokerto pada Januari – Desember 2024

Abstrak

Tujuan: Penelitian ini bertujuan untuk mengetahui korelasi antara subtipe histologis, stadium, usia, dan prognosis kanker serviks uteri pada pasien yang diobati di RSUD Prof. Dr. Soekarjo Margono, Purwokerto, dalam rentang waktu Januari – Desember 2024

Metode: Studi ini merupakan studi retrospektif deskriptif kohort dengan data dari rekam medis. Data yang diambil adalah stadium kanker, usia, dan subtipe histopatologis dan didapatkan dari semua pasien yang memenuhi kriteria inklusi. Analisis statistik dilakukan serta asosiasi diuji dengan uji Chi-Square. Data yang digunakan dalam penelitian diperoleh dari rekam medis pasien di RSUD Margono Soekardjo, Purwokerto pada bulan Januari hingga Desember 2024

Hasil: Dari 582 pasien, sebanyak 245 pasien memenuhi kriteria inklusi. Karsinoma sel skuamosa (SCC) ditemukan pada 147 kasus, sedangkan adenokarsinoma (AC) pada 98 kasus. Sebagian besar pasien berusia >50 tahun dan didiagnosis pada stadium II. SCC paling banyak ditemukan pada stadium II, sementara AC didapatkan paling banyak pada stadium III. Analisis statistik menunjukkan adanya hubungan bermakna dengan korelasi lemah antara usia, stadium, dan prognosis dengan tipe histologis.

Kesimpulan: Terdapat korelasi signifikan antara subtipe histologis dan usia, stadium, serta prognosis kanker serviks.

Kata kunci: Kanker serviks; prognosis; subtipe histologis; stadium; usia

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Introduction

Cervical cancer is one of the most common cancers among women, ranking as the fourth most common after breast, colorectal, and lung cancers. A high mortality rate has been reported, reaching 342.000 deaths annually in 2020, with most cases occurring in low- and middle-income countries. Southeast Asia has been one of the regions most affected, with the highest numbers of diagnoses and deaths. In 2018, cervical cancer was the second most common cancer among women in Indonesia, with an incidence of 180.000 cases per year, most of which were diagnosed at an advanced stage. About 99% of cases are caused by Human Papillomavirus (HPV) infection, primarily types 16 and 18.[1–5] A previous study in Indonesia showed a rapid increase in diagnoses among women aged 40-60 years. HPV infection typically requires 20-30 years after first intercourse to develop into cervical cancer, often remaining undetectable within the first 1-2 years.[6–8] Risk factors include sexually transmitted infections (STIs), immune diseases, early sexual activity, multiple sexual partners, smoking, low socioeconomic status, and high parity.[5,8,9]

Mainly, cervical cancer is divided into two histological subtypes: squamous cell carcinoma (SCC), which is more common, and adenocarcinoma (AC). These two differ in terms of their anatomic origin, biological behavior, lymph node metastasis rate, and sensitivity to radiotherapy or chemotherapy. The prognosis also varies, as patients with AC tend to have a lower survival rate. Moreover, diagnosing AC poses many challenges because lesions can be missed due to their location in the upper part of the endocervical canal. The incidence of SCC peaks around age 55, while in cases of AC, it plateaus after age 44.[10,11]

Several factors that influence the prognosis of cervical cancer include disease staging, lymph node involvement, histological type, age, overall health condition, and whether it is a new case or a recurrence.[4,12,13] Age and histological type are considered significant predictors of prognosis, alongside the stage of the disease and metastasis. Worse prognoses are observed in patients who are older and have the AC subtype.[12,14,15] There are currently no studies examining the correlation between these two variables. Therefore, we need to investigate the relationship between histological types, stage, age, and the prognosis of cervical cancer.

Method

This is a retrospective study with a descriptive cohort design conducted at Prof. Dr. Margono Soekarjo Hospital, Purwokerto, Indonesia. Data were collected from medical records using a total sampling method. All cervical cancer patients from January to December 2024 with complete anatomical pathology data were included. Exclusion criteria included subjects lost to follow-up or deceased, those who refused participation, and subjects with incomplete histological examination results. Patients with cervical cancer were identified from medical records. For each patient, data on the FIGO stage, age, and histological subtype of the cancer were collected. The patients' ages were divided into three age groups. Subjects who did not meet the inclusion criteria were excluded. The remaining data were analyzed statistically. Data distribution was assessed with the Shapiro-Wilk test to determine if variables followed a normal distribution. Parametric tests were used for normally distributed data, while non-parametric tests were applied when data were not normally distributed. The chi-square test evaluated associations between groups. A p-value <0.05 was considered significant. All analyses were performed using IBM SPSS Statistics version 27.0.

Results

A total of 582 subjects with cervical cancer from January to December 2024 were enrolled in this study. Of these, 337 were excluded due to incomplete data. Consequently, 245 subjects were included. Participants were divided into two groups based on the histopathological subtype of their cancer diagnosis. The squamous group includes 147 subjects, while the adenocarcinoma group comprises 98 subjects. Most subjects were over 50 years old and diagnosed with stage II cervical cancer. The distribution of subjects is shown in Table 1. Subjects with squamous cell carcinoma were mostly diagnosed at stage II, whereas those with adenocarcinoma were mainly found at stage III. Most patients had a worse prognosis. A significant, weak correlation was observed between each variable (age, stage, and prognosis) and the histological subtype (Table 2).

Table 1 Distribution of FIGO Stage, Age, Histopathological Subtype, and Prognosis

Variable	n	%
Stadium		
I	37	15.1
II	98	40.0
III	89	36.3
IV	21	8.6
Histological Type		
Adenocarcinoma	98	40.0
Squamous	147	60
Prognosis		
Good	109	44.5
Bad	136	55.5
Age		
<30	16	6.5
30-50	104	42.4
>50	125	51.0

Table 2 Correlation of Age, Stage, and Prognosis with Histological Subtype

Variable	Histological type		*p*	r
	Adenocarcinoma n (%)	Squamous n (%)		
Stadium				
I	22 (9)	15 (6.1)		
II	31 (12.7)	67 (40.0)	0.017	0.204
III	34 (13.9)	55 (22.4)		
IV	11 (4.5)	10 (4.1)		
Prognosis				
Good	33 (13.5)	76 (31.0)	0.005	0.178
Bad	65 (26.5)	71 (29.0)		
Age				
<30	8 (3.3)	8 (3.3)	0.004	0.212
30-50	29 (11.8)	75 (30.6)		
>50	62 (24.9)	64 (26.1)		

Discussion

This study examined the relationship between age, stage, and prognosis with the histopathological subtype of cervical cancer. Most subjects in this study belong to the SCC group, which is consistent with a previous study by Wang et al. that identified SCC as the most common histological subtype globally.[10] The majority of participants were between 40 and 60 years old. These findings are in line with a previous study in Indonesia by Dwipoyono et al. and another by Putri et al. in Indonesia.[8,16] Additionally, a study in Denmark found that the peak age of diagnosis is between 35-44 years and 75-84 years.[17] The age peak for cervical cancer diagnosis is related to the age at first sexual intercourse, and approximately 20 years is the median. Women who have their first sexual intercourse before age 18 are three times more likely to be diagnosed with cervical cancer due to the increased sensitivity of immature cervical cells. The transformation zone of the cervix shifts to the endocervical canal with increasing age, typically after 45 years old.[18,19] The variation in diagnostic age may be influenced by the age at first sexual intercourse.

Respectively, AC and SCC originate from different cell types, glandular and squamous. They are also linked to different types of HPV infection and risk factors. Infection with HPV 18 is more associated with AC, while HPV 16 is strongly linked to SCC. The incidence of SCC increases with smoking and higher parity, but this is not as evident in AC.[20] In this study, we found a significant relationship between the stage of diagnosis and the histopathological type of cancer, but no connection between age at diagnosis and histopathological type. This contrasts with a previous study by Zefina et al., which found a significant relationship between age and histopathological type.[21] Although SCC is most common in people aged 55 years, the diagnosis of individuals with AC generally plateaus after 44 years old.[10,11]

The diagnosis of AC may be delayed compared to SCC due to its location in the endocervical canal, which makes diagnosis more challenging. Patients with AC also more frequently have lymph node involvement and metastasis, resulting in a worse prognosis than SCC.[22] Additionally, patients with AC tend to have a lower 5-year survival rate. Therefore, individuals with AC should receive more aggressive treatment and close monitoring.[11] A previous study by Liu et al. analyzed survival rates among different histopathological groups. In patients with stage I-IIA2, the overall survival rate was not significantly different, but the disease-specific survival rate was higher in the SCC group. For patients with stage IIB-IV, the oncologic outcomes were better in the SCC group. It was noted that the survival rate for patients with SCC after radical radiotherapy and chemotherapy generally exceeds that of patients with AC.[23]

Conclusion

In summary, this study found a weak but significant correlation of age at diagnosis, stage, and prognosis with the histopathological subtype of cervical cancer. A worse prognosis and lower survival rates are often observed in the adenocarcinoma subtype. Further research with a larger sample size may be needed to explore the relationship between histopathological subtypes and prognosis.

References

1. World Health Organization. WHO guideline for screening and treatment of cervical pre-cancer lesions for cervical cancer prevention. World Health Organization; 2021. 97 p.
2. Wu J, Jin Q, Zhang Y, Ji Y, Li J, Liu

X, et al. Global burden of cervical cancer: current estimates, temporal trend and future projections based on the GLOBOCAN 2022. Journal of the National Cancer Center [Internet]. 2025 Jan 23 [cited 2025 May 6]; Available from: https://linkinghub.elsevier.com/retrieve/pii/S2667005425000134

3. Fowler JR, Maani E V., Dunton CJ, Gasalberti DP, Jack BW. Cervical Cancer. Encyclopedia of Behavioral Medicine [Internet]. 2023 Nov 12 [cited 2025 May 6];350–1. Available from: https://www.ncbi.nlm.nih.gov/books/NBK431093/
4. Bhatla N, Aoki D, Sharma DN, Sankaranarayanan R. Cancer of the cervix uteri: 2021 update. International Journal of Gynecology and Obstetrics [Internet]. 2021 Oct 1 [cited 2025 May 6];155(S1):28–44. Available from: /doi/pdf/10.1002/ijgo.13865
5. Agustiansyah P, Rizal Sanif, Siti Nurmaini, Irfannuddin, Legiran. Epidemiology and Risk Factors for Cervical Cancer. Bioscientia Medicina : Journal of Biomedicine and Translational Research. 2021 Apr 5;5(7):624–31.
6. Burger EA, Kim JJ, Sy S, Castle PE. Age of Acquiring Causal Human Papillomavirus (HPV) Infections: Leveraging Simulation Models to Explore the Natural History of HPV-induced Cervical Cancer. Clin Infect Dis [Internet]. 2017 Sep 15 [cited 2025 May 7];65(6):893. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC5850533/
7. Tuncer HA, Tuncer SF. The effect of age On cervical cancer screening in women aged 20-29. Acta Clin Croat [Internet]. 2020 [cited 2025 May 7];59(2):277. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7808238/
8. Putri AR, Khaerunnisa S, Yuliati I. Cervical Cancer Risk Factors Association in Patients at the Gynecologic-Oncology Clinic of Dr. Soetomo Hospital Surabaya. Indonesian Journal of Cancer [Internet]. 2019 Dec 27 [cited 2025 May 7];13(4):104–9. Available from: https://indonesianjournalofcancer.or.id/e-journal/index.php/ijoc/article/view/610
9. Zhang S, Xu H, Zhang L, Qiao Y. Cervical cancer: Epidemiology, risk factors and screening. Chinese Journal of Cancer Research [Internet]. 2020 [cited 2025 May 7];32(6):720. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7797226/
10. Wang M, Huang K, Wong MCS, Huang J, Jin Y, Zheng ZJ. Global Cervical Cancer Incidence by Histological Subtype and Implications for Screening Methods. J Epidemiol Glob Health [Internet]. 2024 Mar 1 [cited 2025 May 7];14(1):94–101. Available from: https://link.springer.com/article/10.1007/s44197-023-00172-7
11. Chen F, Chen L, Zhang Y, Shi L, Xu H, Song T. Survival Comparison Between Squamous Cell Carcinoma and Adenocarcinoma for Radiotherapy-Treated Patients with Stage IIB-IVA Cervical Cancer. Front Oncol [Internet]. 2022 Jul 22 [cited 2025 May 7];12:895122. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC9352995/
12. He B, Chen W, Liu L, Hou Z, Zhu H, Cheng H, et al. Prediction Models for Prognosis of Cervical Cancer: Systematic Review and Critical Appraisal. Front Public Health [Internet]. 2021 May 7 [cited 2025 May 7];9:654454. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC8137851/
13. Cervical Cancer Treatment. PDQ Cancer Information Summaries [Internet]. 2025 Apr 3 [cited 2025 May 7]; Available from: https://www.ncbi.nlm.nih.gov/books/NBK65985/
14. 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 [cited 2025 May 7];31(6):e80. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7593229/

15. Gallardo-Alvarado L, Cantú-de León D, Ramirez-Morales R, Santiago-Concha G, Barquet-Muñoz S, Salcedo-Hernandez R, et al. Tumor histology is an independent prognostic factor in locally advanced cervical carcinoma: A retrospective study. BMC Cancer [Internet]. 2022 Dec 1 [cited 2025 May 7];22(1):401. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC9006627/
16. Dwipoyono B, Nasdaldy, Soemanadi, Sjamsuddin S, Adisasmita AC. Jenis Histologik dan Umur pada Kanker Serviks Uteri di Rumah Sakit Kanker "Dharmais." Indonesian Journal of Cancer. 2007;1:7–11.
17. Bønløkke S, Blaakær J, Steiniche T, Iachina M. Social factors and age play a significant role in cervical cancer and advanced-stage disease among Danish women. BMC Cancer [Internet]. 2024 Dec 1 [cited 2025 Sep 11];24(1):1–15. Available from: https://bmccancer.biomedcentral.com/articles/10.1186/s12885-024-11994-4
18. Sulistyawati D, Faizah Z, Kurniawati EM. An Association Study of Cervical Cancer Correlated with The Age of Coitarche in Dr. Soetomo Hospital Surabaya. Indonesian Journal of Cancer. 2020 Mar 30;14(1):3.
19. Effah K, Tekpor E, Wormenor CM, Essel NOM. Transformation zone types: a call for review of the IFCPC terminology to embrace practice in low-resource settings. Ecancermedicalscience [Internet]. 2023 [cited 2025 Sep 12];17:1612. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC10898880/
20. Rositch AF, Levinson K, Suneja G, Monterosso A, Schymura MJ, Mcneel TS, et al. Epidemiology of Cervical Adenocarcinoma and Squamous Cell Carcinoma Among Women Living With Human Immunodeficiency Virus Compared With the General Population in the United States. Clin Infect Dis [Internet]. 2021 Mar 1 [cited 2025 Sep 15];74(5):814. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC8906686/
21. Zefina RP, Lubis HML. Relationship between Age and Histopathological Type and Grade of Cervical Cancer Incidence. Asian Journal of Multidisciplinary Research and Analysis [Internet]. 2024 [cited 2025 Sep 15];2(3):11–6. Available from: https://journal.berpusi.co.id/index.php/Ajomra/article/view/1127/987
22. Lee KB, Lee JM, Park CY, Lee KB, Cho HY, Ha SY. What is the difference between squamous cell carcinoma and adenocarcinoma of the cervix? A matched case-control study. International Journal of Gynecological Cancer [Internet]. 2006 Jul 1 [cited 2025 Sep 15];16(4):1569–73. Available from: https://www.international-journal-of-gynecological-cancer.com/action/showFullText?pii=S1048891X24040684
23. Liu P, Ji M, Kong Y, Huo Z, Lv Q, Xie Q, et al. Comparison of survival outcomes between squamous cell carcinoma and adenocarcinoma/adenosquamous carcinoma of the cervix after radical radiotherapy and chemotherapy. BMC Cancer [Internet]. 2022 Dec 1 [cited 2025 Sep 15];22(1):1–9. Available from: https://bmccancer.biomedcentral.com/articles/10.1186/s12885-022-09401-x