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Chemotherapeutic and Supportive Treatment Approaches for Cervical Cancer Patients in Indonesia: A Cross-Sectional Study

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Abstract

Cervical cancer is one of the most common cancers in women and ranks as the second leading cause of cancer-related mortality in Indonesia. Its management largely depends on the stage of disease and often requires multimodal approaches. A retrospective cross-sectional descriptive study was conducted using medical records of 185 hospitalized cervical cancer patients from January to December 2024. Data collected included age, disease stage, type of therapy, drug utilization, routes of administration, and histopathological findings. Descriptive analysis was performed and presented as frequency distributions and percentages. Most patients were aged 45–64 years (58.9%) and diagnosed at stage III (49.73%). The most common therapy was surgery (49.73%), followed by brachytherapy (20.54%) and chemotherapy (11.8%). Tranexamic acid was the most frequently prescribed drug (22.01%), while cisplatin paclitacxel and carboplatin were the primary chemotherapeutic agents. The intravenous route dominated drug administration (72.03%). Histopathology most frequently revealed medium-sized tissue lesions (3–5 cm; 21.08%). The majority of cervical cancer patients were diagnosed at advanced stages and underwent surgery as the primary treatment. Cisplatin remains the gold standard chemotherapy agent, administered primarily via the intravenous route. These findings highlight the urgent need for early detection, expanded screening, and HPV vaccination programs to reduce advanced-stage cases.

Keywords: *malignant carcinoma of cervix, hospitalize patient, drug utilization, histopathology.*

INTRODUCTION

Cervical cancer remains a major public health problem worldwide and continues to be one of the leading causes of cancer-related mortality among women. According to the International Agency for Research on Cancer through the Global Cancer Observatory, cervical cancer pointed for approximately 662,301 new cases and 348,874 deaths globally in 2020, making it the fourth most common cancer in women worldwide (Sung, *et al*., 2021).

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The burden of this disease is disproportionately higher in low- and middle-income countries, where limited access to screening and preventive measures contributes to delayed diagnosis and poor clinical outcomes (WHO, 2023).

In Indonesia, cervical cancer represents the second most common cancer among women after breast cancer and remains a major contributor to cancer-related mortality. Data from the World Health Organization indicate that the incidence of cervical cancer in Indonesia remains high due to inadequate screening coverage and limited implementation of preventive strategies such as human papillomavirus (HPV) vaccination (WHO, 2024). Persistent infection with high-risk HPV types, particularly HPV-16 and HPV-18, has been identified as the primary etiological factor responsible for the development of cervical cancer (Cohen, *et al*., 2019).

The management of cervical cancer largely depends on the stage of the disease at diagnosis. Early-stage cervical cancer can be effectively treated with surgical intervention or radiotherapy, whereas advanced stages typically require multi-modal treatment approaches such as chemotherapy, radiotherapy, or concurrent chemoradiation therapy (NCCN, 2024). Among chemotherapeutic agents, cisplatin-based regimens remain the cornerstone of treatment due to their proven effectiveness in improving survival outcomes in cervical cancer patients (Gennigens, *et al*., 2022). However, these therapies may cause several adverse effects, including nephrotoxicity, hematologic toxicity, and gastrointestinal complications, which necessitate careful monitoring and supportive pharmacological management (Dasari and Tchounwou, 2014).

In addition to antineoplastic agents, cervical cancer management frequently involves the use of supportive medications such as analgesics, antiemetics, antibiotics, and antifibrinolytic agents to manage symptoms and treatment-related complications. Evaluating drug utilization patterns in clinical practice is therefore important to ensure rational drug use and optimize therapeutic outcomes in cancer patients. Despite the high burden of cervical cancer in Indonesia, information regarding therapeutic approaches and drug utilization patterns in clinical practice is remains limited. Previous studies conducted in Indonesia have primarily focused on the epidemiology, risk factors, and screening programs for cervical cancer rather than evaluating treatment patterns and pharmacological management in hospital settings (Nuranna, *et al*., 2012; Setiawan, *et al*., 2020). Understanding real-world treatment patterns is essential to assess adherence to clinical guidelines and to improve rational drug use in oncology care (Cohen, *et al*., 2022; Saito, *et al*., 2023). Therefore, investigating therapeutic approaches and drug utilization patterns among hospitalized cervical cancer patients is important to provide evidence on current clinical practices and to identify opportunities for improving cancer management in Indonesia. This study aimed to describe the therapeutic approaches and drug utilization patterns among hospitalized cervical cancer patients based on medical record data from a referral hospital in Indonesia.

MATERIALS AND METHODS

Study Design and Setting

This study employed a retrospective cross-sectional descriptive design to evaluate therapeutic approaches and drug utilization patterns among cervical cancer patients. The study was conducted using medical record data from a referral hospital in Palembang, Indonesia. Cross-sectional studies are commonly used in clinical research to describe the characteristics of a population and to assess treatment patterns within a specific period (Setia, 2016).

Study Population and Sample

The study population consisted of all patients diagnosed with cervical cancer who were hospitalized during the study period from January to December 2024. A total of 345 patient medical

records were identified from the hospital database. The sample size was determined using Slovin's formula, resulting in 185 patient records selected for analysis. The samples were selected using a simple random sampling technique to ensure representativeness of the study population.

Inclusion and Exclusion Criteria

The inclusion criteria were patients with a confirmed diagnosis of cervical cancer based on clinical and histopathological examination and complete medical record data during the study period. Patients with incomplete medical records or unclear treatment information were excluded from the study.

Data Collection

Data were collected retrospectively from patients' medical records using a structured data collection form. The variables collected included patient characteristics (age), clinical stage of cervical cancer, types of therapy received (surgery, radiotherapy, brachytherapy, chemotherapy, and chemoradiation), drug utilization patterns, routes of drug administration, and histopathological findings.

Ethical Consideration

Ethical approval for this study was obtained from the Institutional Ethics Committee of the hospital prior to data collection. All patient data were anonymized to ensure confidentiality and privacy throughout the research process. Ethical approval number: DP.04.03/D.XVIII.06.08/ETIK/089/2025.

Data Analysis

The collected data were analyzed using descriptive statistical methods. The results were presented as frequencies and percentages to describe the distribution of patient characteristics, therapeutic approaches, and drug utilization patterns among cervical cancer patients, used Microsoft excel.

RESULTS

Patient Characteristics

A total of 185 cervical cancer patients were included in this study. The majority of patients were aged 45–64 years (59%), followed by those aged 25–44 years (31%) (Table 1).

Table 1. Age distribution of cancer patients (n=185).

Years	N	Percentage (%)
Adults (25-44) years	58	31.4%
Pre-elderly (45-64) years	109	58.9%
Elderly >64 years	18	9.7%
Total	185	100%

Distribution of Cancer Stage

The distribution of cervical cancer stages is presented in Table 2. Most patients were diagnosed at stage III (66%), followed by stage II (21%), stage I (8%), and stage IV (5%).

Table 2. Distribution by cancer stage.

Stadium	N	Percentage (%)
Stadium I	11	5.95%
Stadium II	29	15.68%
Stadium III	92	49.73%
Stadium IV	8	4.32%
*MD	45	24.32%
Total	185	100%

Note: Staging data were available for 140/185 patients; 45 cases had missing data.

Use of Anticancer Drugs

Among the hospitalized cervical cancer patients, 20% received anticancer drug therapy, while 80% did not receive anticancer drugs during hospitalization, as shown in Table 3.

Table 3. Cancer therapeutic used.

Cancer Drug Used	N	Percentage (%)
Drug used cancer therapy	37	22.16%
None	148	77.84%
Total	185	100%

Types of Therapeutic Modalities

The most frequently used treatment modality was surgery (52%), followed by brachytherapy (19%), chemotherapy (12%), radiotherapy (9%), and chemoradiation (7%) (Table 4).

Table 4. Types of therapy.

Modality of Therapy	N	Percentage (%)
Surgery	84	49.73%
Surgery + Brachytherapy	4	
Surgery + Chem	3	
Surgery + Chem + Rad	1	
Radiotherapy	18	9.72%
Brachytherapy	38	20.54%
Chemotherapy (Cisplatin, Paclitaxel, Carboplatin)	23	11.8%
Chemoradiation	14	7.2%
Total	185	100 %

Note: Some patients received multiple treatment modalities.

Most Frequently Prescribed Drugs

A total of 367 drugs were prescribed to cervical cancer patients (N=185) during hospitalization. The most frequently prescribed drug was tranexamic acid (43.78%), followed by ketorolac (28.10%), mefenamic acid (18.37%) ceftriaxone (16.75%), and diclofenac sodium (15.13%) (Table 5).

Table 5. Most frequently prescribed drugs (N=185).

Class of Drugs	Drugs Used	Number of patients	Percentage (%)
Antifibrinolic	Tranexamic Acid	81	43.78%
Analgesic Non-Opioid	Paracetamol	3	1.62%
Analgesic Opioid	Fentanyl	1	0.27%
Antibiotics	Cefazolin	3	1.62%
	Cefotaxime	4	2.18%
	Ciprofloxacin	16	8.64%
	Cefadroxil	10	5.40%
	Ceftriaxone	31	16.75%
	Cefuroxime	6	3.24%
Antiinflammation NSAID	Mefenamic Acid	34	18.37%
	Ketoprofen	11	5.94%
	Ketorolac	52	28.10%
	Natrium Diclofenac	28	15.13%
Antiinflammation Corticosteroid	Dexamethasone	15	8.10%
Antiemetic	Ondansetron	20	10.81%
	Domperidone	1	0.54%
Alkylating Agents	Carboplatin	16	8.64%
	Cisplatin	18	9.72%
Antineoplastic	Bleocin	2	1.08%
Antimitotic	Paclitaxel	14	7.56%
Stimulant Hematopoietic	Leucogen	1	0.54%
Total	21	365	100%

Note: N represents the total number of drug prescriptions; each patient may receive more than one medication.

Histopathological Examination

Histopathological examination results are presented in Table 6. The most frequently reported category was moderate-sized lesions (3–5 cm), accounting for 21.08% of the examined specimens.

Table 6. Histopathology assay of specimens.

Histopathology Assay Category	N	Percentage (%)
Histopathology assay small grade (range diameter = 2cm/volume maximum to 5cc)	37	20.00%
Histopathology assay moderate grade range diameter = 3-5cm/ volume maximum to 25cc)	39	21.08%
Histopathology assay large grade (range=6-10cm/ volume maximum to 50cc)	13	7.02%
Examination of cytology Pap smear LBC (Interpretation)	27	14.59%
Examination of histopathology surgical staging	3	1.62%
Examination of cytology fluid of pleura	1	0.55%
Pacet B (Examination of Immunohistochemistry with 3 of Antibody)	1	0.54%
NR	63	34.05%
Total	185	100%

Note: Data on lymph node size were obtained from medical records, based on radiological examinations (CT scan/USG), and recorded using the short-axis diameter (mm). NR=Not Record.

DISCUSSION

The present study demonstrated that the majority of cervical cancer patients were diagnosed at advanced stages, particularly stage III. This finding is consistent with previous studies conducted in Indonesia, which reported that more than 60% of cervical cancer cases are diagnosed at late stages (Anggraeni, 2011; Winarto, *et al*., 2018). Similar observations have been reported at Soetomo Academic Hospital, where a substantial proportion of patients were diagnosed at stage III and many had no prior history of cervical cancer screening. Data from the INASGO Cancer Registry also indicate that stage III remains the most common stage at diagnosis.

The predominance of stage III cases in this study highlights a consistent pattern of late presentation in clinical settings. Compared with findings from previous hospital-based studies in Indonesia, the proportion of advanced-stage cases in this study appears similarly high, suggesting that there has been limited improvement in early detection at the clinical level. This may indicate ongoing challenges in translating national screening strategies into effective early diagnosis in real-world practice.

From a clinical perspective, the high proportion of advanced-stage patients has important implications for treatment patterns. Patients diagnosed at stage III are more likely to require multimodal therapy, including chemotherapy and radiotherapy, rather than single-modality treatment. This condition may also explain the higher utilization of certain drug regimens and routes of administration observed in this study. In addition, advanced-stage disease is generally associated with increased treatment complexity, higher risk of adverse drug reactions, and greater healthcare resource utilization (Marth, *et al*., 2017).

In this study, surgery was the most frequently applied therapeutic modality. The present study demonstrated that the majority of cervical cancer patients were diagnosed at advanced stages,

particularly stage III. In parallel, intravenous administration was the predominant route (72.0%), and surgery was reported as the most common therapeutic approach (49.73%). These findings should be interpreted cautiously in relation to established clinical guidelines. According to the National Comprehensive Cancer Network guidelines, stage III cervical cancer is primarily managed with concurrent chemoradiation rather than surgery (Marth, *et al*, 2017; Cohen, *et al*., 2019). The apparent predominance of surgical intervention in this study may be explained by several factors. First, the use of inpatient medical records may introduce selection bias, as surgical procedures are more likely to be documented during hospitalization, while radiotherapy is often administered in outpatient settings and may not be fully captured. Second, the recorded surgical procedures may include diagnostic, staging, or palliative interventions rather than definitive curative surgery. Third, limitations in access to radiotherapy facilities and referral system constraints may influence treatment decisions in real-world clinical settings. Furthermore, the high utilization of the intravenous route observed in this study is consistent with the predominance of advanced-stage disease, as patients with stage III cervical cancer commonly require systemic chemotherapy, which is primarily administered intravenously. This pattern supports the interpretation that the observed treatment approaches reflect the complexity of managing advanced-stage disease rather than strict adherence to a single treatment modality.

The high utilization of tranexamic acid in this study is consistent with its role in preventing perioperative bleeding, which is a common concern in gynecological oncology surgery. Previous randomized clinical trials have shown that tranexamic acid significantly reduces intraoperative blood loss and decreases the need for blood transfusion (Ker, *et al*., 2013). In addition, non-steroidal anti-inflammatory drugs (NSAIDs) such as ketorolac and diclofenac were frequently prescribed for pain management associated with surgical procedures and radiotherapy. Although supportive medications were more frequently prescribed, cisplatin remained the main chemotherapeutic agent, which is consistent with international treatment recommendations for cervical cancer (Dasari and Tchounwou, 2014; Gennigens, *et al*., 2022).

In this study showed the predominance of cisplatin, carboplatin, and paclitaxel use in cervical cancer patients. It may be attributed to their established role as standard chemotherapy regimens in cervical cancer management, particularly in advanced-stage disease. Cisplatin-based therapy is widely used due to its radiosensitizing effect and proven efficacy, while carboplatin is considered an alternative with lower nephrotoxicity. Paclitaxel is commonly combined with platinum agents because of its synergistic antineoplastic activity. Also the predominance of the intravenous route of drug administration that observed in this study is consistent with standard oncological practice. Intravenous administration allows for precise dose control and rapid systemic distribution of anticancer agents, which is essential in the management of hospitalized cancer patients (Gennigens, *et al*., 2022). Oral administration was less frequently used, likely due to limitations related to drug absorption, patient clinical conditions, and preferences for inpatient treatment protocols.

Histopathological examination most frequently revealed moderate-sized lesions (3–5 cm). Tumor size is a well-established prognostic factor in cervical cancer. Patients with tumors larger than 4 cm are generally associated with poorer prognosis when treated with surgery alone and may benefit from combined treatment modalities such as chemoradiation (Dasari and Tchounwou, 2014). Therefore, earlier detection of tumors within this size range may provide a therapeutic opportunity for multimodal treatment strategies (Agus Somia, *et al*., 2025). In recent years, cervical cancer treatment has evolved with the introduction of targeted therapy and Targeted therapy and immunotherapy were not captured in this inpatient-based dataset and are

therefore not reported as study findings. Their role in cervical cancer management is discussed based on current guidelines (NCCN, 2024) and should be considered as external evidence.

Study Limitations

This study has several limitations. First, the study used a retrospective design, which may limit the completeness and accuracy of medical record data. Second, the analysis was restricted to inpatient data, which may not fully represent the overall population of cervical cancer patients, particularly those receiving outpatient treatment. Finally, the study did not evaluate long-term clinical outcomes, such as survival rates or treatment responses.

CONCLUSION

The majority of cervical cancer patients in this study were aged 45–64 years and were predominantly diagnosed at stage III. Surgical procedures were the most frequently recorded therapeutic interventions, although this finding should be interpreted cautiously, as it may reflect inpatient-based data capture and the inclusion of diagnostic or non-definitive procedures. Tranexamic acid was the most commonly prescribed medication, while cisplatin remained the primary chemotherapeutic agent. The intravenous route was the predominant method of drug administration, consistent with the management of advanced-stage disease. Histopathological findings were most commonly reported as moderately differentiated lesions. These findings underscore the need to strengthen early detection strategies, including expanding cervical cancer screening programs and improving HPV vaccination coverage. Future research should incorporate outpatient data, assess long-term clinical outcomes, and further evaluate treatment patterns in relation to clinical guidelines, including the role of targeted therapy and immunotherapy in cervical cancer management.

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