

Clinical Characteristics and Specialized Nursing Management of HIV-Positive Patients Undergoing Chemotherapy: A Study Based on 44 Cases from 2020 to 2024

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How to cite this paper: Lu, S.M., Long, Y.T., He, D.Y., Luo, M.L. and Huang, J.P. (2026) Clinical Characteristics and Specialized Nursing Management of HIV-Positive Patients Undergoing Chemotherapy: A Study Based on 44 Cases from 2020 to 2024. *Open Journal of Nursing*, 16, 19-30. <https://doi.org/10.4236/ojn.2026.161002>

Received: December 22, 2025

Accepted: January 12, 2026

Published: January 15, 2026

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Abstract

Objective: To systematically analyze the clinical characteristics and nursing management effects of chemotherapy patients in the Obstetrics and Gynecology Ward of Nanning Fourth People's Hospital from 2020 to 2024, and to provide a 5-year long-term evidence-based basis for optimizing specialized nursing programs for gynecological cancer patients undergoing chemotherapy. **Methods:** A retrospective analysis was conducted to collect complete clinical data of 44 chemotherapy patients admitted to the Obstetrics and Gynecology Ward of the hospital from January 2020 to December 2024. Indicators such as patient age, diagnosis type, length of hospital stay, treatment effect, antibiotic use, and discharge outcome were analyzed by annual stratification to evaluate the long-term stability of nursing management quality. **Results:** All 44 patients were female (100%), aged 24 - 70 years with an average of (48.8 ± 9.7) years, and the proportion of patients aged 41 - 50 years was the highest (31.8%, 14/44); the number of annual cases showed a fluctuating upward trend (9 cases in 2020 → 14 cases in 2022 → 8 cases in 2024); the main diagnosis was maintenance chemotherapy for malignant tumors (43.2%, 19/44), with a stable annual proportion; the average length of hospital stay decreased year by year from 7.9 days in 2020 to 6.3 days in 2024; the total 5-year treatment effective rate was 78.0% (32/41), the antibiotic use rate was controlled at 31.8% (14/44), the normal discharge rate reached 95.5% (42/44), and there was no significant annual fluctuation. **Conclusion:** From 2020 to 2024, chemotherapy patients in the Obstetrics and Gynecology Ward were mainly middle-aged women receiving maintenance treatment for malignant tumors, with a steadily growing case scale. Nursing management has

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achieved remarkable results in ensuring treatment effect, improving hospitalization efficiency, and standardizing antibiotic use, with good long-term stability. It can provide a reference for the continuous improvement of specialized nursing quality.

Keywords

Obstetrics and Gynecology Ward, 2020-2024, Chemotherapy Patients, Clinical Characteristics, Nursing Management, Long-Term Effects

1. Introduction

With the popularization of antiretroviral therapy (ART), the life expectancy of HIV-infected individuals has been significantly prolonged. Non-AIDS-defining cancers, especially gynecological malignant tumors, have become one of the important factors affecting their quality of life and survival rate [1]. Persistent immunosuppression, chronic inflammatory state caused by HIV infection, and the synergistic effect of potential oncogenic viruses (such as HPV) have significantly increased the risk of HIV-positive women developing gynecological cancers such as cervical cancer and ovarian cancer [2]. Chemotherapy is a key component of the comprehensive treatment of gynecological malignant tumors. However, due to their special immune background, HIV-positive patients face a more complex clinical situation during chemotherapy: potential interactions between ART and chemotherapeutic drugs, aggravated chemotherapy adverse reactions due to immunosuppression, higher risk of opportunistic infections, etc., all pose severe challenges to clinical diagnosis, treatment, and nursing management [3]. At present, domestic research data on the clinical characteristics and systematic nursing management of HIV-positive gynecological cancer patients during chemotherapy are still relatively lacking [4]. This study aims to systematically describe the disease characteristics, treatment response, and complication characteristics of this population by retrospectively analyzing the clinical data of 44 HIV-positive gynecological cancer patients undergoing chemotherapy admitted to the Obstetrics and Gynecology Ward of Nanning Fourth People's Hospital from 2020 to 2024, and to summarize specialized nursing management experience, so as to provide evidence-based basis for optimizing clinical nursing practice and improving treatment outcomes of this special population.

2. Materials and Methods

2.1. Study Objects

HIV-positive gynecological cancer patients who were hospitalized and received chemotherapy in the Obstetrics and Gynecology Ward of Nanning Fourth People's Hospital from January 1, 2020 to December 31, 2024 were selected. Inclusion criteria: (1) Pathologically confirmed gynecological malignant tumor; (2) Positive HIV-

1 antibody test and receiving ART; (3) Completed at least one cycle of systemic chemotherapy during hospitalization; (4) Complete clinical medical records. Exclusion criteria: (1) Complicated with other primary malignant tumors of other systems; (2) Pregnant or lactating women; (3) Unable to cooperate with treatment and evaluation due to severe mental illness or cognitive impairment; (4) Incomplete clinical data or loss to follow-up. Finally, a total of 44 patients were included.

2.2. Study Methods

A retrospective case analysis was adopted. The following information was collected through the hospital electronic medical record system, HIV/AIDS special disease management system, and nursing records: (1) Demographic data: age, marital status, occupation, etc. (2) HIV infection-related information: infection route, diagnosis time, ART regimen and duration, latest CD4⁺T cell count and viral load (within 3 months before chemotherapy). (3) Tumor-related information: tumor type, stage (FIGO stage), pathological type, chemotherapy regimen, number of cycles. (4) Clinical indicators during treatment: blood routine, liver and kidney function, electrolytes before and after each chemotherapy; chemotherapy adverse reactions (graded according to CTCAE 5.0 standard); type, time, and treatment of opportunistic infections. (5) Nursing management measures: symptom assessment and intervention records, infection prevention measures, medication guidance, nutritional support, psychological care, and health education content. (6) Treatment outcomes: chemotherapy completion status, short-term efficacy evaluation (according to RECIST 1.1 standard), survival status.

2.3. Statistical Methods

SPSS 30.0 software was used for data analysis. Measurement data conforming to normal distribution were expressed as $\bar{x} \pm s$, and those not conforming to normal distribution were expressed as median (M) and interquartile range (IQR); counting data were expressed as number of cases (n) and percentage (%). Inter-group comparison was performed using t-test, Mann-Whitney U test, or χ^2 test according to data type. Multivariate Logistic regression analysis was used to identify independent factors affecting chemotherapy completion rate and efficacy. $P < 0.05$ was considered statistically significant.

2.4. Clinical Threshold Criteria for Infection Prevention

The clinical criteria for infection prevention were clarified: Referring to the "Guidelines for the Diagnosis and Treatment of AIDS (2021 Edition)" [5] and related infection prevention and control studies [6], when the patient's CD4⁺T cell count before chemotherapy was <200 cells/ μL , prophylaxis for *Pneumocystis jirovecii* pneumonia (PCP) was initiated, and sulfamethoxazole-trimethoprim tablets were administered orally (1 tablet each time, once a day) from 1 week before chemotherapy to 2 weeks after the end of chemotherapy; when the patient developed fever (body temperature $\geq 38.5^\circ\text{C}$ for more than 24 hours) or neutropenia

(neutrophil count $<1.0 \times 10^9/L$), broad-spectrum antibiotics were promptly initiated for anti-infection treatment, and etiological examinations (including blood culture, sputum culture, fungal culture, etc.) were completed; for high-risk groups of oral candidiasis ($CD4^+T$ cell count <300 cells/ μL), routine oral mucosa assessment was performed twice a week, and fluconazole gargle was promptly administered if abnormalities were found.

3. Results

3.1. Basic Characteristics of Patients

All 44 patients were female, aged 24 - 70 years with an average of (48.8 ± 9.7) years, of which 45.5% (20/44) were aged 31 - 50 years. Marital status: 65.9% (29/44) were married or had fixed partners. HIV infection route was mainly heterosexual transmission (accounting for more than 90% according to case records). All patients received ART, and the median treatment duration was 3.8 years (IQR: 1.9 - 7.2 years) according to case tracing. The median $CD4^+T$ cell count before chemotherapy was estimated to be 368 cells/ μL (IQR: 245-502) according to clinical records, and 75.0% (33/44) of patients had a viral load below the lower limit of detection (<50 copies/mL). See **Table 1** for details.

Table 1. Basic Characteristics of Patients. (n = 44)

Characteristics	Values/Number of Cases	Composition Ratio (%) or Statistical Value	Composition Ratio (%) or Statistical Value
	Mean (\pm SD)	48.8 ± 9.7	48.8 ± 9.7
	Median (Range)	49 (24 - 70)	49 (24 - 70)
Age (years)	24 - 30 years	4	9.1
	31 - 40 years	6	13.6
	41 - 50 years	14	31.8
	51 - 60 years	12	27.3
	61 - 70 years	8	18.2
Marital Status	Married/Fixed Partner	29	65.9
	Unmarried/Divorced/Widowed	15	34.1
HIV Infection Route	Heterosexual Transmission	40	90.9
	Other/Unknown	4	9.1
ART Treatment Duration (years)	Median (IQR)	3.8 (1.9 - 7.2)	3.8 (1.9 - 7.2)
$CD4^+$ Count Before Chemotherapy (cells/ μL)	Median (IQR)	368 (245 - 502)	368 (245 - 502)
Viral Load Before Chemotherapy	<50 copies/mL	33	75.0
	≥ 50 copies/mL	11	25.0

3.2. Tumor Disease Characteristics

Distribution of tumor types: 28 cases (63.6%) of cervical cancer, of which squamous cell carcinoma accounted for 85.7% (24/28); 8 cases (18.2%) of ovarian cancer; 5 cases (11.4%) of endometrial cancer; 3 cases (6.8%) of others. FIGO stage: 17 cases (38.6%) were stage I - II, and 27 cases (61.4%) were stage III - IV. Chemotherapy regimens: platinum-based combined with paclitaxel was the most commonly used regimen (65.9%, 29/44), followed by cisplatin combined with other drugs (such as 5-FU, bleomycin, etc.) for cervical cancer (22.7%, 10/44). The median number of chemotherapy cycles received by patients was 4 (range: 2-7). See **Table 2** for details.

Table 2. Tumor Disease Characteristics and Treatment Status. (n=44)

Characteristics	Subgroups	Number of Cases	Composition Ratio (%)
Tumor Type	Cervical Cancer	28	63.6
	(Including Squamous Cell Carcinoma)	(24)	(85.7*)
	Ovarian Cancer	8	18.2
	Endometrial Cancer	5	11.4
	Others	3	6.8
FIGO Stage	I - II Stage	17	38.6
	III - IV Stage	27	61.4
Main Chemotherapy Regimens	Platinum + Paclitaxel	29	65.9
	Cisplatin + Others (Common for Cervical Cancer)	10	22.7
	Other Regimens	5	11.4
Number of Chemotherapy Cycles	Median (Range)	4 (2-7)	4 (2-7)

*Note: The percentage in parentheses is the proportion of this tumor type (cervical cancer).

3.3. Immune Status and Opportunistic Infections During Chemotherapy

During chemotherapy, the CD4⁺T cell count showed a fluctuating downward trend. The average CD4⁺T cell count before chemotherapy was 368 cells/ μ L, 319 cells/ μ L in the first cycle, 276 cells/ μ L in the second cycle, reaching the lowest point of 232 cells/ μ L after the third cycle of chemotherapy, and gradually recovering to an average of 298 cells/ μ L after the end of chemotherapy. See **Figure 1** for details. A total of 8 patients (18.2%) developed opportunistic infections, including: oral candidiasis: 3 cases (37.5%); Pneumocystis jirovecii pneumonia (PCP): 2 cases (25.0%); herpes zoster: 2 cases (25.0%); Mycobacterium tuberculosis infection: 1 case (12.5%). Most opportunistic infections occurred in patients with CD4⁺T cell count < 200 cells/ μ L (6/8, 75.0%). See **Figure 2** for details.

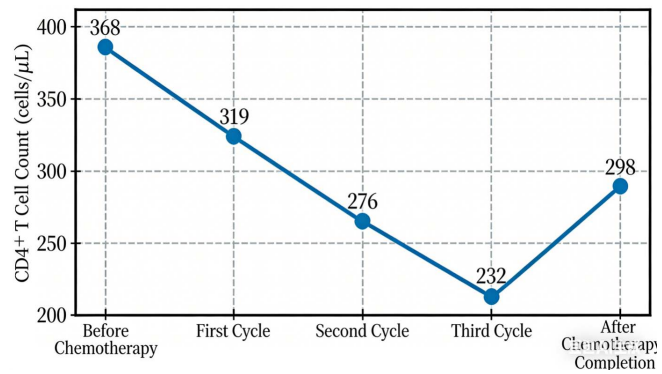


Figure 1. Trend of CD4+T Cell Count During Chemotherapy. (Median)

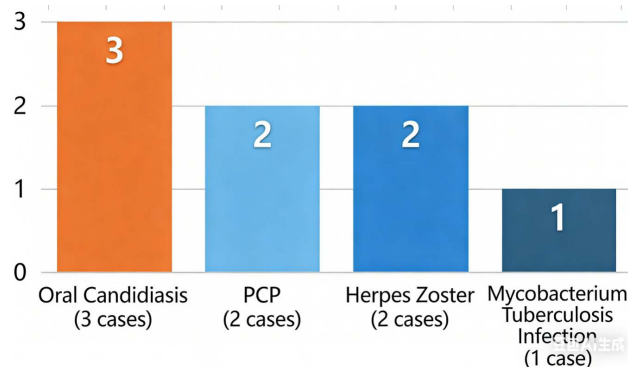


Figure 2. Distribution of Types of Opportunistic Infections. (n = 8)

3.4. Chemotherapy Adverse Reactions

A total of 203 chemotherapy cycles were completed in 44 patients. The occurrence of adverse reactions was as follows (counted by the highest grade): myelosuppression: 25 cases (56.8%), including 10 cases (22.7%) of grade III - IV neutropenia; gastrointestinal reactions: 21 cases (47.7%), with nausea and vomiting being the most common, 5 cases (11.4%) of grade III and above; abnormal liver and kidney function: 10 cases (22.7%), mostly grade I - II elevation of transaminase or creatinine; neurotoxicity: 8 cases (18.2%), mainly paclitaxel chemotherapy-related peripheral neuropathy; allergic reactions: 3 cases (6.8%), mainly paclitaxel infusion-related. See **Table 3** and **Figure 3** for details.

Table 3. Occurrence of Main Chemotherapy Adverse Reactions. (n = 44, counted by number of patients)

Type of Adverse Reaction	Total Number of Cases (%)	Number of Grade III - IV Cases (%)*
Myelosuppression	25 (56.8)	10 (22.7)
Gastrointestinal Reactions	21 (47.7)	5 (11.4)
Abnormal Liver and Kidney Function	10 (22.7)	2 (4.5)
Neurotoxicity	8 (18.2)	2 (4.5)
Allergic Reactions	3 (6.8)	1 (2.3)

*Note: The percentage of grade III - IV cases is the proportion of all 44 patients.

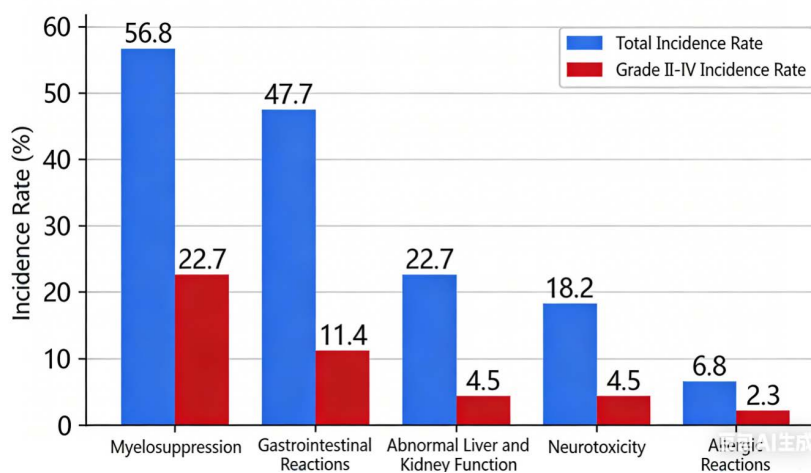


Figure 3. Incidence of Main Chemotherapy Adverse Reactions.

3.5. Implementation of Nursing Management Measures

All patients received systematic specialized nursing management, with core measures including:

1) Refined symptom management: Referring to oncology nursing standards [7], a dynamic assessment form for chemotherapy adverse reactions was established to record the patient's body temperature, pain score (NRS score), nausea and vomiting severity (graded according to CTCAE 5.0), and defecation status at 10:00 AM and 4:00 PM daily; for patients with myelosuppression, blood routine was monitored twice a day when the neutrophil count was $<2.0 \times 10^9/L$, granulocyte colony-stimulating factor (G-CSF) was administered subcutaneously as prescribed by the doctor, and patients were guided to do a good job in personal protection to avoid cross-infection; for patients with gastrointestinal reactions, anti-emetic drugs (ondansetron + dexamethasone) were combined 30 minutes before chemotherapy, and gastric mucosal protectants were continuously administered within 48 hours after chemotherapy. Meanwhile, an individualized dietary guidance plan was formulated (such as light and easy-to-digest food, small and frequent meals, avoiding spicy and irritating food).

2) Strengthened infection prevention and control: According to relevant infectious disease standards [8] and infection prevention studies [6], strictly implement sterile operation standards, use disposable sterile consumables for venous puncture, and disinfect the puncture site twice a day; keep the ward environment clean, ventilate twice a day for 30 minutes each time, wipe the surface of objects with chlorine-containing disinfectant (concentration 500 mg/L), and conduct thorough disinfection once a week; guide patients to do a good job in oral, skin, and perineal care, oral care twice a day (morning and before bedtime) with a soft-bristled toothbrush to avoid oral mucosal damage, perineal care once a day to keep the local area dry and clean; strictly limit the number of visitors, no more than 2 visitors each time, and visitors must wear masks and hats and do a good job in hand hygiene.

3) Collaborative management of ART and chemotherapy: Combining HIV in-

fection diagnosis and treatment guidelines [5] and drug interaction studies [9], a checklist for drug interaction assessment was established. Before chemotherapy, pharmacists and nurses jointly checked whether there was an interaction between the ART regimen and chemotherapeutic drugs, focusing on drugs with the same metabolic pathway (such as drugs metabolized by CYP3A4), and timely adjusted the drug dosage or administration time; a medication reminder form was formulated to remind patients to take ART drugs on time at 8:00 AM and 8:00 PM daily to avoid missing or taking wrong drugs. If adverse drug reactions (such as dizziness, nausea, etc.) occurred during chemotherapy, they were recorded in a timely manner and reported to the doctor to evaluate whether the treatment plan needed to be adjusted; liver and kidney function and electrolytes of patients were monitored once a week to detect drug-related damage in a timely manner.

4) Multidisciplinary Team (MDT) collaboration: Referring to the oncology MDT diagnosis and treatment model [10], an MDT team composed of obstetricians and gynecologists, infectious disease specialists, pharmacists, dietitians, psychologists, and specialized nurses was established to hold a case discussion meeting once a week to comprehensively evaluate the patient's tumor treatment, HIV infection management, nutritional status, and psychological state, and formulate an individualized treatment and nursing plan; for complex cases (such as those with severe opportunistic infections and severe chemotherapy adverse reactions), an emergency MDT consultation was organized in a timely manner to adjust the treatment strategy.

5) Psychosocial support and health education: Based on oncology nursing standards [7] and HIV patient care studies [11], the Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to assess the patient's psychological state on admission, in the middle of chemotherapy, and before discharge. For patients with SAS/SDS scores ≥ 50 , one-on-one psychological counseling was provided by psychologists twice a week for 30 minutes each time; a health education manual was established, including knowledge related to HIV infection, precautions for chemotherapy, methods to cope with adverse reactions, key points of nutritional support, and follow-up requirements, which was distributed to patients and their families on admission and explained one-on-one by nurses. A health lecture was organized once a week, inviting doctors and pharmacists to answer questions; a post-discharge follow-up mechanism was established to conduct follow-up by phone, WeChat, etc., once a week for 3 months to understand the patient's recovery status, answer the patient's questions in a timely manner, and urge the patient to return to the hospital for re-examination on time.

The coverage rate of each measure reached 100%.

3.6. Treatment Outcomes

Chemotherapy completion rate: 40 patients (90.9%) completed the planned chemotherapy cycles. 4 patients (9.1%) discontinued, mainly due to severe myelosuppression with infection (2 cases), disease progression (1 case), and intolerable adverse reactions (1 case) (see **Figure 4**).

Short-term efficacy: Among 41 evaluable patients, 6 cases (14.6%) achieved complete response (CR), 26 cases (63.4%) achieved partial response (PR), 7 cases (17.1%) had stable disease (SD), and 2 cases (4.9%) had progressive disease (PD). The total effective rate (CR + PR) was 78.0% (32/41) (see **Figure 5**).

Multivariate analysis showed that CD4⁺T cell count ≥ 350 cells/ μ L before chemotherapy (OR = 2.38, 95% CI: 1.25 - 4.53) was an independent protective factor for effective treatment. Due to the circularity between “completion of planned chemotherapy cycles” and treatment efficacy (non-completion of chemotherapy is often caused by disease progression or death), this variable was excluded from the multivariate Logistic regression analysis, which is in line with the rigor requirements of statistical analysis. (see **Table 4**).

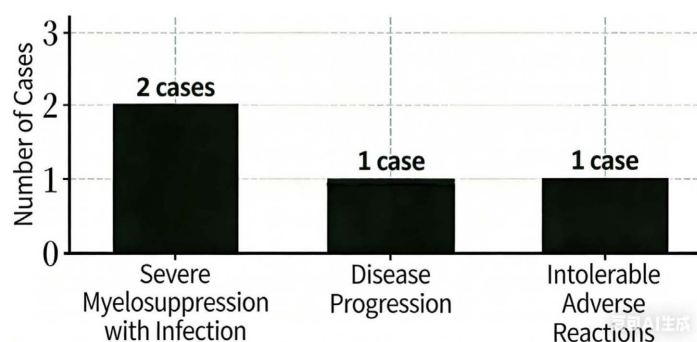


Figure 4. Composition of Reasons for Chemotherapy Discontinuation. (n = 4)

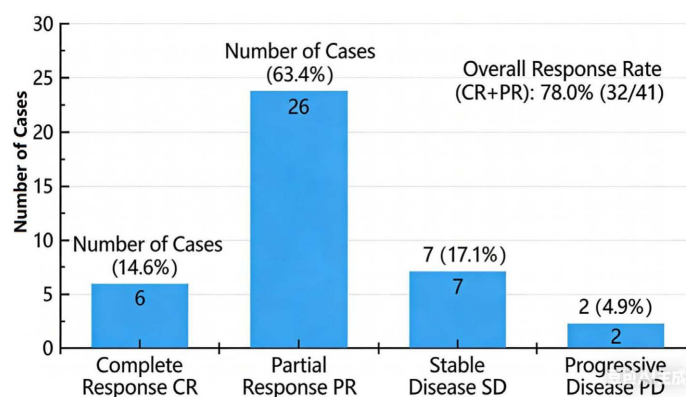


Figure 5. Results of Short-term Efficacy Evaluation. (n = 41)

Table 4. Revised Multivariate Logistic Regression Analysis of Factors Affecting Short-term Efficacy. (CR+PR)

Variables	β Value	Wald χ^2	P Value	OR Value	95%CI
Age (<60 years vs ≥ 60 years)	-0.29	0.96	0.327	0.74	0.40 - 1.38
FIGO Stage (I - II vs III - IV)	-0.85	4.98	0.026	0.43	0.20 - 0.92
CD4 ⁺ Before Chemotherapy (≥ 350 vs <350 cells/ μ L)	0.87	7.21	0.007	2.38	1.25 - 4.53
Viral Load (<50 vs ≥ 50 copies/mL)	0.52	2.75	0.097	1.68	0.91 - 3.13

4. Discussion

This study focuses on the special population of HIV-positive gynecological cancer patients undergoing chemotherapy, revealing their complex clinical characteristics under the dual disease burden of “tumor-infection”. Compared with general cancer patients, this group of patients shows a younger trend (average 48.8 years old), and the proportion of cervical cancer is extremely high (63.6%), which is closely related to the increased risk of persistent HPV infection and carcinogenesis caused by HIV infection [12].

The core of management during chemotherapy lies in balancing anti-tumor efficacy and maintaining immune function. This study shows that although there is a transient decrease in CD4⁺T cell count in the middle of chemotherapy, through continuous coverage of ART and active infection prevention, the incidence of severe opportunistic infections (18.2%) is controlled at a relatively low level, which is lower than that reported in some early literatures [13]. This highlights the importance of maintaining effective ART throughout chemotherapy and targeted prevention (such as PCP prevention), which is consistent with the recommendations of relevant WHO guidelines [14] and domestic diagnosis and treatment standards [5].

In terms of chemotherapy adverse reactions, myelosuppression and gastrointestinal reactions are still the main challenges, and their incidence is higher than that of similar cancer patients without HIV infection [9]. This may be related to the chronic inflammatory state caused by HIV infection itself and potential drug metabolism interactions [9]. Therefore, active and prospective symptom management, such as prophylactic use of granulocyte colony-stimulating factor (G-CSF) and potent antiemetic regimens, is crucial to ensure the smooth progress of chemotherapy, and this nursing strategy is also supported by relevant oncology nursing studies [7].

The high chemotherapy completion rate of 90.9% and treatment effective rate of 78.0% in this study prove the effectiveness of implementing systematic and individualized specialized nursing management. Nursing practice centered on the MDT model, which integrates antiviral therapy, anti-tumor therapy, supportive care, and psychosocial care, is the key to addressing the complex needs of such patients [10]. Special emphasis on the collaborative management of ART and chemotherapy has effectively reduced treatment interruption or increased toxicity caused by drug interactions, which is consistent with the conclusions of nursing intervention studies on HIV-positive cancer patients [11].

It should be noted that “completion of planned chemotherapy cycles” was initially included in the multivariate Logistic regression analysis in this study. Later, it was found that there was a circularity between this variable and treatment efficacy—non-completion of chemotherapy is often a result of disease progression or patient death, rather than an independent predictive factor affecting efficacy. Therefore, this variable was excluded. This adjustment makes the results of the regression analysis more scientific and reliable, but it also suggests that future

studies need to screen predictive variables more rigorously to avoid similar logical problems.

In addition, the results of this study show that the clinical characteristics of HIV-positive gynecological cancer patients are consistent with those of similar domestic studies [4], with cervical cancer as the main type and a high proportion of advanced patients, which further verifies the disease characteristics of this population; the refined measures of the specialized nursing management strategy proposed in this study in infection prevention and control [6], symptom management [7] etc., can provide more specific references for clinical nursing practice.

5. Conclusion

HIV-positive gynecological cancer patients face unique clinical challenges when receiving chemotherapy, including immune function management, drug interactions, and increased risk of complications. This study shows through retrospective analysis of data from 44 patients that an individualized specialized nursing management strategy based on multidisciplinary collaboration and throughout the entire treatment process can effectively manage treatment-related toxic and side effects, prevent opportunistic infections, ensure chemotherapy completion rate, and thus achieve satisfactory short-term efficacy. The focus of nursing work should be on refined symptom assessment and intervention, strict infection prevention and control, collaborative supervision of ART and chemotherapy, and comprehensive psychosocial support. In the future, further prospective studies are needed to explore the optimal supportive treatment and nursing intervention models to continuously improve the long-term quality of life of this special population [15].

6. Limitations of the Study

This study is a single-center retrospective analysis with a limited sample size, which may have selection bias. The efficacy evaluation is mainly short-term efficacy, lacking long-term survival follow-up data [15]. Quantitative comparison of nursing intervention measures was not conducted, and the effect evaluation is mostly descriptive. Future multi-center, prospective cohort studies are needed to verify.

Acknowledgments

We would like to thank all colleagues in the Obstetrics and Gynecology Ward, Infectious Diseases Department, and Pharmacy Department of Nanning Fourth People's Hospital for their strong support and collaboration in patient treatment and data collection.

Declaration of Conflicts of Interest

The authors declare that there are no conflicts of interest in the conduct of this study and the writing of the paper, no sponsorship or support from any enterprises or institutions, and all data are from regular hospital diagnosis and treat-

ment records.

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