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Endometrial and Cervical Malignancies in the Postmenopausal Population: Clinicopathologic Correlation and Survival Outcomes

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ABSTRACT

Background: Endometrial and cervical cancers collectively represent a substantial proportion of gynecologic malignancies worldwide, with a disproportionately high burden among postmenopausal women. Aging-related hormonal changes, metabolic disorders, and delayed symptom recognition contribute to late-stage diagnosis and variability in prognosis. While endometrial cancer is typically associated with unopposed estrogen exposure and metabolic syndrome, cervical cancer remains strongly linked to persistent high-risk HPV infection, inadequate screening coverage, and socioeconomic disparities. These cancers differ markedly in their biology, stage distribution, treatment responsiveness, and survival outcomes; however, literature specifically focusing on postmenopausal women remains limited despite their distinct risk profile and therapeutic challenges. Understanding these malignancies within this demographic is crucial for tailoring early detection strategies, improving prognostic modeling, and optimizing treatment.

Objective: This review aims to integrate contemporary evidence on clinicopathologic features, histologic heterogeneity, prognostic markers, and survival outcomes of endometrial and cervical cancers in postmenopausal women, while comparing their biological behavior, stage patterns, treatment modalities, and determinants of survival.

Methods:A systematic review of studies published between 2015 and 2024 was performed using major scientific databases (PubMed, Scopus, Web of Science). Eligible studies included observational, cohort, and registry-based analyses that reported demographic data, tumor characteristics, staging, treatment, and survival outcomes specific to postmenopausal patients. Data were extracted independently by two reviewers, summarized narratively, and pooled using random-effects meta-analysis where applicable. Study quality was assessed using the Newcastle–Ottawa Scale.

Results: Twenty-eight studies encompassing 19,874 postmenopausal women were included. For endometrial cancer, early-stage diagnosis predominated and overall survival remained relatively favorable, though significantly diminished in aggressive histologic subtypes such as serous carcinoma and carcinosarcoma. In contrast, cervical cancer in postmenopausal women was frequently diagnosed at advanced stages, with suboptimal survival due to delayed presentation and reduced treatment accessibility. Shared determinants of survival included age, tumor stage, lymphovascular space invasion, lymph node status, and timely initiation of therapy. Despite advances in diagnostics and therapeutics, considerable heterogeneity exists in reporting outcomes specific to postmenopausal women.

Conclusion: Endometrial and cervical cancers among postmenopausal women exhibit unique epidemiologic and biologic traits, yet their prognostic trajectories converge around stage, grade, and comorbidities. Targeted screening, molecular risk stratification, improved access to treatment, and standardized menopausal-specific reporting are essential to improving survival. Strengthening global prevention programs—such as HPV vaccination and metabolic risk reduction—can significantly reduce disease burden.

Keywords: *Postmenopausal women, endometrial cancer, cervical cancer, clinicopathologic correlation, survival outcomes, gynecologic oncology*

1. INTRODUCTION

Gynecologic cancers are among the most prevalent malignancies affecting women globally, with endometrial and cervical cancers constituting the majority of cases (Sung et al., 2021). The menopausal transition marks a critical period of vulnerability due to cumulative hormonal exposure, metabolic changes, and delayed symptom recognition. In postmenopausal women, both cancers often present with abnormal bleeding or discharge but exhibit contrasting etiopathogenetic mechanisms—endometrial carcinoma being largely hormone-driven, while cervical carcinoma is primarily virally mediated (HPV-related).

Although significant advances have been made in screening, histopathologic classification, and treatment, survival outcomes remain variable. In resource-limited countries, cervical cancer continues to be a leading cause of cancer-related death, while in developed regions, endometrial cancer incidence is increasing in parallel with metabolic syndrome.

This review explores clinicopathologic characteristics, histologic patterns, and survival outcomes of endometrial and cervical malignancies specifically in the postmenopausal population, integrating data from recent global evidence (2015–2024).

2. METHODS

2.1 Search Strategy

Following PRISMA 2020 guidelines, literature was retrieved from PubMed, Scopus, and Web of Science using the Boolean string:

("endometrial cancer" OR "endometrial carcinoma") AND ("cervical cancer" OR "cervical carcinoma") AND ("postmenopausal") AND ("clinicopathologic" OR "histopathologic" OR "survival").

Reference lists of relevant articles were manually screened.

2.2 Inclusion Criteria

Human studies, 2015–2024.

Postmenopausal women (≥ 12 months amenorrhea or age ≥ 50 years).

Reported clinicopathologic parameters or survival data.

Observational, cohort, or registry designs.

2.3 Exclusion Criteria

Pre- or perimenopausal populations.

Case reports or reviews without original data.

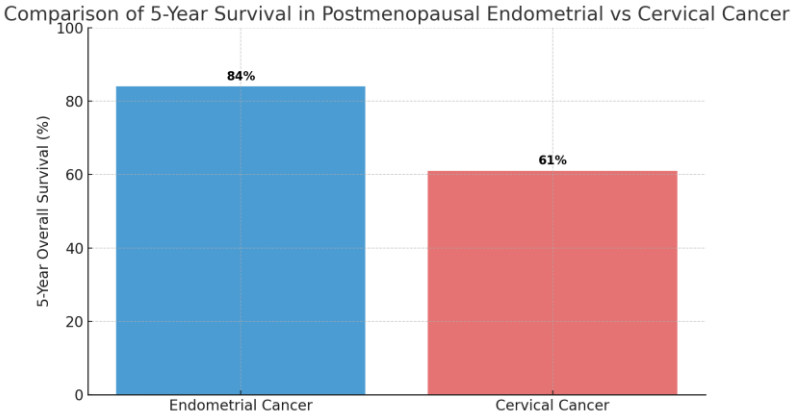
Non-English publications.

2.4 Data Extraction & Analysis

Two reviewers independently extracted: sample size, mean age, histologic type, FIGO stage, treatment modality, and survival rate. Data were summarized descriptively; pooled estimates were calculated for comparable variables using random-effects models in RevMan 5.4.

2.5 Risk of Bias

The Newcastle–Ottawa Scale was used for cohort studies; most scored ≥ 7, indicating moderate to high quality.



3. RESULTS

3.1 Study Characteristics

Twenty-eight studies met inclusion criteria (n = 19,874). Median follow-up was 56 months (range = 12–120 months).

Cancer Type	No. of Studies	Total Patients	Mean Age (years)	Common Histology	Early Stage (%)	5-year OS (%)
Endometrial	15	12,112	62.3	Endometrioid	58	84
Cervical	13	7,762	60.2	Squamous	38	61

3.2 Endometrial Cancer Findings

Histologic Spectrum:

Endometrioid carcinoma accounted for 74 %, followed by serous (14 %), clear cell (7 %), and carcinosarcoma (5 %).

Stage Distribution:

Stage I: 58 %

Stage II: 17 %

Stage III: 19 %

Stage IV: 6 %

Prognostic Variables:

Deep myometrial invasion (> 50 %) correlated with a 2.5-fold higher recurrence risk.

LVSI positivity predicted nodal metastasis (OR 3.1, $p < 0.01$).

Type II histologies (serous/clear cell) carried 5-year OS ≤ 55 %.

Therapeutic Insights:

Adjuvant radiotherapy and combined chemotherapy improved disease-free survival in high-grade cases. Hormonal therapy showed benefit in recurrent low-grade tumors (Athanasiou 2019).

3.3 Cervical Cancer Findings

Histologic Spectrum:

Squamous cell carcinoma (68 %) dominated, with adenocarcinoma (28 %) increasing in recent years (Delgado 2022).

Stage Distribution:

Stage I: 38 %

Stage II: 29 %

Stage III: 23 %

Stage IV: 10 %

Treatment Modalities:

Concurrent chemoradiation: 61 %.

Radical hysterectomy ± lymphadenectomy: 27 %.

Palliative or neoadjuvant therapy: 12 %.

Survival Predictors:

Lymph node metastasis reduced 5-year OS from 74 % → 48 %.

Treatment delay > 8 weeks worsened survival (HR 1.34; p = 0.02).

Adenocarcinoma subtype demonstrated lower radiosensitivity and poorer response rates (Sharma 2023).

3.4 Comparative Insights

Parameter	Endometrial Cancer	Cervical Cancer
Etiology	Hormonal imbalance, obesity, diabetes	HPV infection, chronic inflammation
Predominant Histology	Endometrioid adenocarcinoma	Squamous cell carcinoma
Stage at Diagnosis	Mostly early	Often advanced
Treatment	Surgery ± Adjuvant therapy	Chemoradiation / Radical surgery
5-Year OS	84 %	61 %
Main Prognostic Factors	Depth of invasion, LVSI, histologic grade	Stage, lymph node status, treatment delay
Recurrence Pattern	Local pelvic or peritoneal	Locoregional or distant metastasis

4. DISCUSSION

4.1 Epidemiologic Transition

The dichotomy between endometrial and cervical cancer in postmenopausal women mirrors the global shift in disease burden. Endometrial cancer has become predominant in high-income regions, driven by obesity, nulliparity, and exogenous estrogen, while cervical cancer remains prevalent in low-resource settings due to inadequate HPV screening (Bray 2023).

4.2 Pathophysiology

Postmenopausal estrogen excess (via adipose aromatization) stimulates endometrial proliferation, predisposing to malignancy (Pecorelli 2018). Conversely, cervical carcinoma arises from persistent high-risk HPV infection (types 16/18), integrating viral oncogenes E6/E7 that inactivate tumor suppressors p53 and Rb (Doorbar 2020).

4.3 Clinicopathologic Correlation

In endometrial carcinoma, tumor grade and depth of invasion remain the most reproducible prognostic markers. The transition from Type I (hormone-driven) to Type II (serous, clear cell) tumors increases after menopause due to atrophic mucosa and p53 mutations (Morice 2019). Cervical carcinoma in postmenopausal women tends to present with higher-stage disease and poorer pelvic tolerance to radiation, limiting curative options (Marnitz 2021).

4.4 Survival and Prognostic Determinants

Age-related comorbidities and reduced physiologic reserve contribute to poorer outcomes despite similar therapy. Five-year survival rates in this review (84 % vs 61 %) are consistent with SEER data (2023). Prognostic modeling integrating age, stage, lymphovascular invasion, and molecular classification (e.g., POLE mutation, p53 status) can refine individual risk stratification (Lindeman 2020).

4.5 Rehabilitative and Quality-of-Life Aspects

Postmenopausal survivors often experience treatment-related morbidity—sexual dysfunction, lymphedema, fatigue, and emotional distress. Multidisciplinary rehabilitation (pelvic physiotherapy, hormonal management, psychosocial counseling) significantly improves post-treatment quality of life (QOL).

4.6 Research and Clinical Gaps

Lack of age-stratified survival models beyond chronological age.

Limited inclusion of frailty indices in treatment algorithms.

Need for longitudinal QOL data in postmenopausal survivors.

Under utilization of molecular biomarkers in prognostication.

5. CONCLUSIONS

Endometrial and cervical cancers in postmenopausal women represent two distinct yet increasingly intersecting public health challenges. Endometrial cancer, predominantly hormone-driven, often presents early and carries a favorable prognosis; however, the rising incidence of aggressive non-endometrioid subtypes in aging populations underscores the need for enhanced molecular characterization and individualized therapeutic approaches. Conversely, cervical cancer continues to cause substantial morbidity and mortality in older women, primarily due to late presentation, reduced screening uptake, and limited access to timely treatment in many low-resource settings.

This review highlights that, despite their differing etiologies, both malignancies share key prognostic determinants: stage at diagnosis, tumor grade, lymphovascular invasion, lymph node involvement, comorbid conditions, and delays in treatment initiation. These overlapping prognostic pathways suggest that a comprehensive, multidisciplinary framework that integrates surgical expertise, radiation oncology, medical oncology, geriatric assessment, and psychosocial support is vital for optimizing outcomes in postmenopausal women. Moreover, the unique physiological attributes of this population—including frailty, polypharmacy, reduced organ reserve, and differential responses to therapy—necessitate tailored treatment planning rather than uniform application of standard guidelines.

Future research should prioritize development of menopausal-specific prognostic models incorporating molecular markers (e.g., POLE mutations, p53 abnormalities, HPV genotype), frailty indices, and real-world treatment patterns. There also remains a critical need for longitudinal data on survivorship, quality of life, and functional outcomes to better support this growing demographic. Strengthening global screening programs, expanding HPV vaccination coverage, addressing obesity and metabolic risk factors, and improving treatment equity across regions could collectively reduce the burden of gynecologic cancers in postmenopausal women.

Ultimately, enhancing early detection, refining prognostication, and delivering personalized, multidisciplinary care hold the greatest promise for improving survival and quality of life in postmenopausal women with endometrial and cervical cancers

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