

BRIEF COMMUNICATIONS

Recent Anatomical Trends in Cervical Cancer in Sri Lanka (2015–2022): Predominance of Endocervical and Overlapping Lesions and Implications for Screening

A Atchuthan

National Cancer Institute, Apeksha Hospital, Sri Lanka

Abstract

Objective: The anatomical distribution of cervical cancer is central to the effectiveness of screening and treatment. Age-related migration of the transformation zone into the endocervical canal alters lesion accessibility and detection. Recent national data allow reassessment of cervical cancer anatomy in the contemporary era. The objective of the study was to describe recent trends (2015–2022) in the anatomical distribution of cervical cancer in Sri Lanka and examine their implications for screening and management.

Methods: Population-based cervical cancer registry data from 2015–2022 were analyzed. Tumors were classified by anatomical subsite using ICD-O topography codes as endocervix, exocervix, overlapping lesion, or cervix not otherwise specified (NOS). Temporal patterns were examined descriptively.

Results: Among anatomically specified cervical cancers, endocervical cancers consistently outnumbered exocervical cancers throughout 2015–2022. Overlapping lesions increased during this period, while a large proportion of cases remained coded as NOS.

Conclusion: Recent data demonstrate a predominance of endocervical and anatomically complex cervical cancers in Sri Lanka. This distribution reflects cervical morphological change with age and presents inherent challenges to ectocervix-focused screening approaches.

Keywords: Cervical anatomy; Endocervix; Exocervix; Overlapping lesions; Transformation zone

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Corresponding author

A Atchuthan

email: abarana2001@gmail.com



<https://orcid.org/0000-0001-7348-8869>

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Introduction

The uterine cervix is anatomically divided into the exocervix and endocervix, separated by the transformation zone, a dynamic region that migrates proximally with age, parity, and hormonal change (1,2) (Figure 1). This migration has profound implications for cervical carcinogenesis and its detection (2,4). While traditional screening paradigms were developed around ectocervical squamous disease, increasing evidence indicates that endocervical and anatomically extensive tumors now represent a substantial proportion of cervical cancers (4,5).

Sri Lanka has implemented organized cervical cancer screening for more than two decades and introduced HPV vaccination into the national immunization program in 2017. However, cervical cancer incidence has remained stable in recent years (6). Understanding recent anatomical distribution patterns is therefore essential to interpreting screening performance from an anatomical standpoint rather than solely through program coverage metrics (4,6).

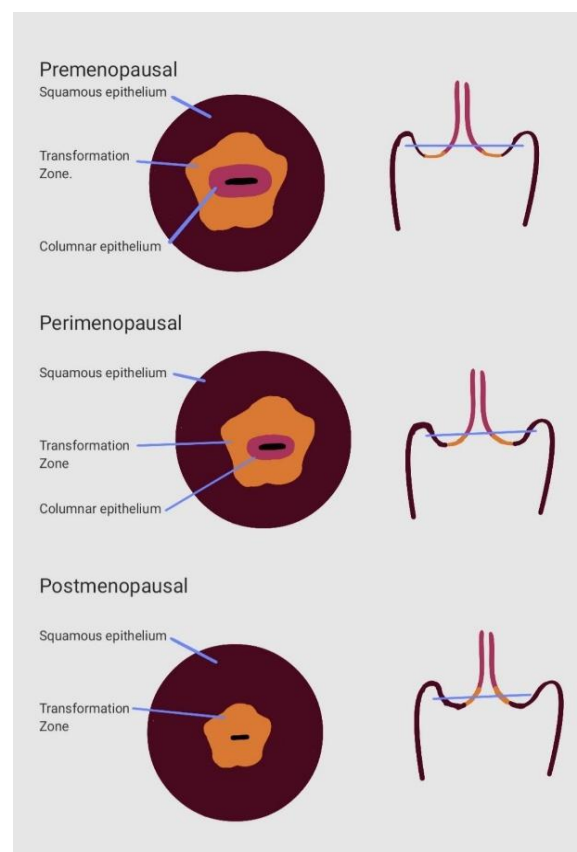
This study examines recent trends (2015–2022) in the anatomical distribution of cervical cancer in Sri Lanka, focusing on endocervical, exocervical, overlapping, and unspecified lesions.

Methods

Population-based cervical cancer data for 2015–2022 were obtained from the Sri Lanka National Cancer Registry. Tumors were classified using ICD-O topography codes (1): Endocervix (C53.0): Tumors confined to the endocervical canal, Exocervix (C53.1): Tumors confined to the ectocervical surface, overlapping lesion (C53.8): Tumors involving more than one cervical subsite, Cervix unspecified (C53.9): Tumours without documented subsite. Overlapping lesions were coded only when explicit multi-subsite involvement was recorded, and were distinct from unspecified cases (1,2). Annual counts

and proportional distributions by anatomical subsite were examined descriptively. No reclassification of NOS cases was attempted.

Figure 1. Schematic representation of age-related



migration of the cervical transformation zone.

Results

Between 2015 and 2022, annual cervical cancer incidence in Sri Lanka remained stable at approximately 900–1,100 cases per year, with no sustained decline observed during the study period (6) (Figure 2).

Endocervical versus exocervical distribution:

Among cases with specified anatomical subsite, endocervical cancers consistently outnumbered exocervical cancers in every year between 2015 and 2022. This pattern was most pronounced from 2016 onwards. For example, in 2017 and 2022, endocervical cases were approximately two to three times more frequent than exocervical cases. *Overlapping lesions:* Overlapping cervical cancers increased during the recent period, particularly after 2016. These lesions represented tumors extending across both endocervical and

ectocervical regions, indicating anatomically extensive disease at diagnosis (2, 4).

Unspecified cervix: A substantial majority of cervical cancers continued to be coded as

cervix not otherwise specified throughout 2015–2022. This reflects limitations in anatomical documentation rather than absence of site-specific disease (1, 2).

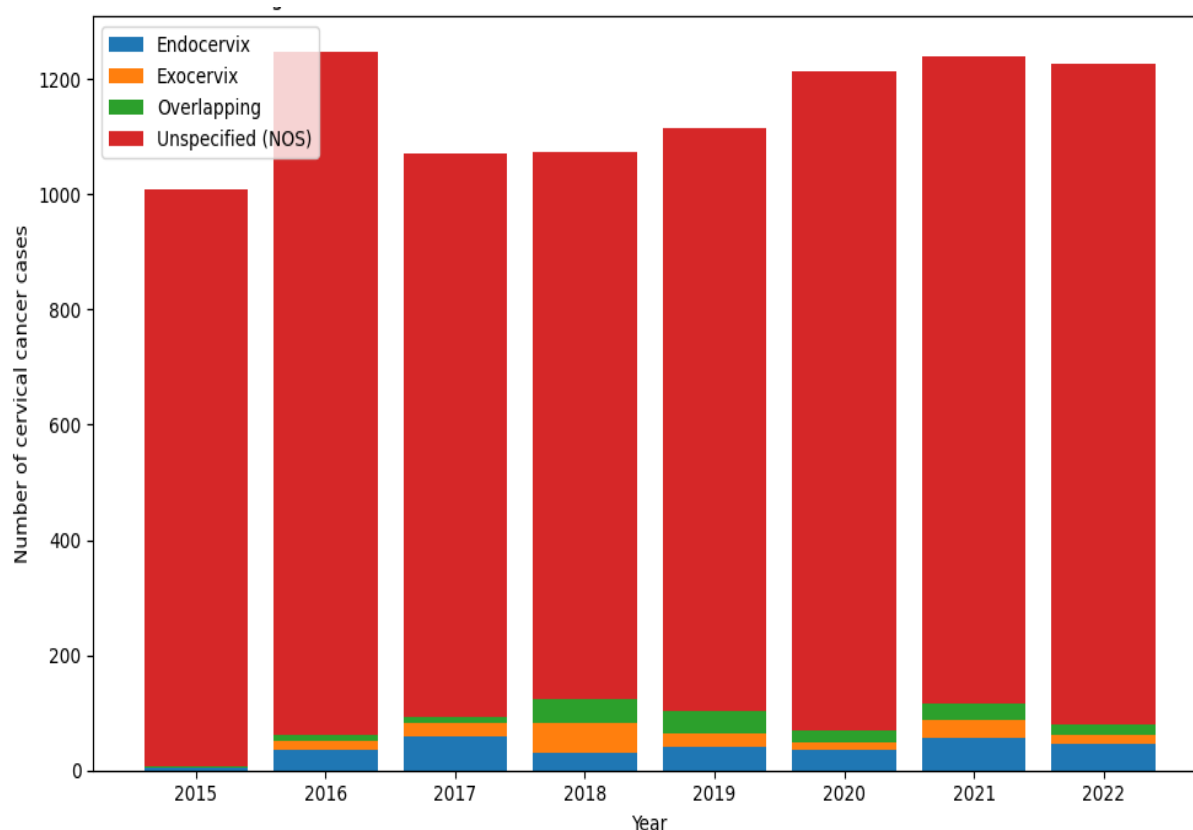


Figure 2: Anatomical distribution of cervical cancer by subsite in Sri Lanka, 2015–2022. Stacked bar chart showing annual case counts classified as endocervical, exocervical, overlapping, and cervix not otherwise specified.

Discussion

This analysis of recent national data demonstrates that cervical cancer in Sri Lanka is anatomically dominated by endocervical and overlapping disease among cases with specified subsite. Importantly, this pattern has persisted throughout 2015–2022, the contemporary screening and early post-HPV-vaccination era and is shown in Figure 1.

From an anatomical perspective, this distribution is biologically plausible. With advancing age, the transformation zone migrates into the endocervical canal, increasing the likelihood that neoplastic lesions arise beyond the ectocervical surface (2, 4). Endocervical tumors exfoliate fewer abnormal cells and are less accessible to

visual inspection, rendering cytology-based screening inherently less sensitive (3, 6).

In early reproductive life, the squamocolumnar junction is located on the ectocervical surface. With increasing age and hormonal change, the transformation zone progressively migrates into the endocervical canal, reducing accessibility for cytology-based screening and increasing the likelihood of endocervical and anatomically overlapping cervical cancers (Figure 2).

Overlapping lesions further highlight anatomical complexity. These tumors typically arise near the transformation zone and expand bidirectionally, obscuring the site of origin (2, 4). Their increasing recognition in recent years may

reflect both improved diagnostic awareness and persistent late-stage presentation (6).

The high proportion of unspecified cases underscores systemic challenges in anatomical documentation, including advanced disease at presentation, superficial biopsies, and registry abstraction constraints (1, 2). Importantly, the presence of large NOS categories should not be interpreted as absence of anatomical patterning; rather, it likely masks a substantial burden of endocervical and anatomically extensive disease. From a treatment standpoint, endocervical and overlapping cancers present greater surgical and radiotherapeutic challenges, including difficulty achieving clear margins and increased parametrial involvement (4, 5). These anatomical factors may contribute to the observed stability of cervical cancer mortality despite treatment availability (6).

Analysis restricted to 2015–2022 demonstrates that recent cervical cancer burden in Sri Lanka is characterised by predominance of endocervical and anatomically overlapping lesions among specified cases. This anatomical pattern reflects cervical morphological change with age and poses fundamental challenges to ectocervix-focused screening and management strategies (2, 4, 6). Anatomically informed screening approaches are essential to address this mismatch between disease distribution and detection.

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