COLLEGE OF HEALTH SCIENCES, SCHOOL OF MEDICINE, DEPARTMENT OF OBSTETRICS AND GYNECOLOGY

POSTGRADUATE PROGRAM

Pattern and relative frequency of Gynaecological malignancies treated in Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia:

Thesis to be submitted to the department of obstetrics and Gynecology, Addis Ababa University in partial Fulfillment for the requirements of specialization certificate in obstetrics and Gynecology

September, 2024

Addis Ababa, Ethiopia.

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September 2024 G.C

Principal investigator: Dr. Ousman Hussein (MD, Obstetrics and Gynecologic Resident)

Department of Obstetrics and Gynecologic, School of Medicine, Obstetrics and Gynecology Department Addis Ababa University,

Advisors:

1. **Dr.Esayas Berhanu (MD) (Assistant Professor of Obstetrics and Gynecology; School of Medicine, College of Health Sciences, Addis Ababa University)**
2. **Dr.Andualem Ersumo (MD) (Assistant Professor of Obstetrics and Gynecology; School of Medicine, College of Health Sciences, Addis Ababa University)**

September, 2024 Addis Ababa, Ethiopia

DECLARATION

I, Dr. Ousman Hussein hereby declare that this thesis entitled **"Pattern and relative frequency of Gynaecological malignancies treated in Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia"** was fully undertaken by me under the guidance of my advisor and that I have, to the best of my knowledge and effort, cited all various sources of information used in this thesis, and I am also declaring that this thesis has not been submitted to any other institution for the award of any degree, certificate, masters, or diploma.

Ousman … (MD) _____
Principal investigator Signature
Date

I hereby certify that I have read and evaluated this research thesis relating to **"Pattern and relative frequency of Gynaecological malignancies treated in Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia"** under my guidance from its inception up to its current format and that it can be submitted for final approval in partial fulfillment of the Degree of Specialty in Obstetrics and Gynecology. I also certify that the above declaration made by the investigator is correct to the best of my knowledge as an advisor.

_____ _____ _____
Advisor Signature
Date

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ACRONYMS

AKTH	Aminu Kano Teaching Hospital
COI	Co-investigator
DC	Data Collectors

DRPC	Department Research and Publication Committee
EC	Endometrial Cancer
FIGO	International Federation of Gynecology and Obstetrics
GLOBOCAN	Global Cancer Observatory
HCG	Human Chorionic Gonadotropin
HPV	Human Papilloma Virus
HUCSH	Hawassa University Comprehensive and Specialized Hospital
OPD	Outpatient Department
OR	Operation Room
PI	Principal Investigator
SD	Standard Deviation
SND	Standard Normal Distribution
SPSS	Statistical Package For Social Sciences
TASH	Tikur Anbessa Specialized Hospital
UATH	University of Abuja Teaching Hospital

1 ABSTRACT

Background: Gynecological cancers are common and are among the leading causes of cancer-related deaths worldwide. Gynecological malignancies have a greater physical, financial, emotional, and social impact on women and society at large. The burden of these gynecologic cancer incidence and mortality rates is rapidly growing worldwide and has become an important barrier to increasing life expectancy. In Africa, cancer is emerging as a critical public health problem. Ethiopia's cancer incidence is increasing, as is the situation in other sub-Saharan nations. The pattern of gynecological cancers varies throughout various geographical locations, but unfortunately, data regarding patterns of gynecologic malignancy are not readily available in most African countries, including our country, Ethiopia. In our hospital (TASH), as it is one of the major cancer treatment centers in Ethiopia, there is a paucity of knowledge and data regarding patterns of gynecologic malignancy, and knowing patterns of gynecological malignancies will help in setting priorities for disease prevention and control.

Objective: The aim of this study was to determine the pattern and relative frequency of different types of gynecological malignancies at Tikur Anbessa Specialized Hospital (TASH).

Method: A hospital-based retrospective analysis of all the cases of female gynecological malignancies from September 2020 to August 2023 was conducted at Tikur Anbessa Specialized Hospital (TASH). The study population was all patients who were diagnosed with gynecological cancer at Tikur Anbessa Specialized Hospital (TASH). Data was collected from the sources, imported into a computer, and analyzed using SPSS version 25. Ethical clearance was obtained from the Department Research and Publication Committee (DRPC).

Results: Out of 1993 patients with gynecologic malignancy, cervical cancer (83%) was the most common gynecological malignancy, followed by ovarian cancer (5%), gestational trophoblastic neoplasm (GTN 4.3%), vulvar cancer (4.2%), uterine cancer (3.1%), and vaginal cancer (0.4%). In the case of cervical cancer, the most common age group was 51–60 years. The majority of patients presented at the ages of 51–60 years. Among the patients studied, 50.4% were grand multiparous. Of the cervical cancer cases, 90% were squamous cell carcinoma, and the commonest presenting complaints were irregular vaginal bleeding (56.4). Among ovarian tumor cases, 76.7% had epithelial, while 23.3% had non-epithelial cancer. Squamous cell carcinoma was 96.4% in the vulva, while endometrial adenocarcinoma (56.6%) was more frequent in the uterus. For gestational trophoblastic neoplasm (GTN), 16.5% of patients had choriocarcinoma, and menstrual irregularities were the commonest complaint (68.2%). The majority of women with ovarian and cervical cancer arrived at late stages of the disease.

Conclusion: The prevalence of cervical cancer is unusually high when compared to regional and global prevalence levels. Given that cervical cancers are preventable, it is imperative to acknowledge the significance of health education in the routine screening and treatment of premalignant lesions. Further scale up of the program and very effective, accessible, easy, acceptable methods for the prevention of the disease is recommended to significantly lower the morbidity and death rate from gynecological malignancies, especially cervical cancer.

Key Word: Pattern, Relative frequency, teaching hospitals, cervical cancer

2 INTRODUCTION

2.1 BACKGROUND

In the twenty-first century, cancer is predicted to be the primary cause of mortality and the single biggest factor lowering life expectancy in every nation on the planet. Globally, the burden of cancer incidence and death is rising quickly and has become a significant roadblock to extending life expectancy. According to GLOBOCAN 2020, there will be 28.4 million new instances of cancer worldwide in 2040, a 47% increase from 2020. Breast cancer (24.5%), colorectal cancer (9.4%), and lung cancer (8.4%) are the most frequent cancers in women (1, 2).

Gynecological cancer is the fourth most often diagnosed cancer and the fourth leading cause of cancer mortality in women, with 604 000 new cases and 342 000 deaths predicted globally in 2020. Of all female malignancies, cervical cancer has the highest frequency (81.6%). Female genital tract cancers are serious global health concerns that considerably increase cancer-related mortality and morbidity worldwide. About 10% of new instances of cancer in women and 12% of cancer deaths worldwide are due to gynecological malignancies. Gynecological malignancies make up almost one-third (32.67%) of all female cancers, according to research done in sub-Saharan Africa. Of all female malignancies, cervical cancer has the highest frequency (81.6%). The proportion of cancers in females that are of genital tract origin ranges from as high as 31.6-35.0% in sub-Saharan Africa to as low as 12.7–13.4% in North America (3, 9, 4).

Similar to other sub-Saharan nations, Ethiopia is seeing an increase in cancer incidence, with an estimated 77,352 new cases of the disease in 2020 alone. However, as there isn't a national cancer registry, extrapolations of data from the single Addis Ababa population-based cancer registry are used to create these estimates of the cancer burden in the nation. The two most prevalent diseases in women are tumors of the breast (31.5%) and cervix (14.1%), according to the initial statistics from Addis Ababa's population-based cancer registry (1).

Gynecological malignancy is the uncontrolled growth of abnormal cells that originate from the reproductive organs and spread to nearby tissues. (7) Gynecological malignancies involve the

genital tract and include those of the ovary, cervix, uterus, vulva, vagina, and gestational trophoblastic malignancies (8).

Cervical cancer is a common type of malignancy, accounting for about 6% of all cancers, making it the fourth most common cancer in women worldwide, and cases make up around 85% of all cases in developing nations (7). Due to the implementation of routine advanced screening, there has been a substantial decrease in the incidence and death rates of cervical cancer during the past 50 years in developed nations. The prevalence of cervical cancer is still high in low-resource nations like ours, and poor cervical screening practices and a lack of awareness are important causes of mortality for women in these nations (10). Ovarian cancer is the second most frequent form of female genital cancer and is a leading cause of mortality from cancers of the female genital tract. Due to the lack of a standardized screening method for early identification of ovarian cancer and the non-specific symptoms of the disease, about 75% of patients with ovarian cancer appear in the late stages of the disease (4).

Endometrial cancer is the most frequent gynecological cancer in the industrialized world. Increased diabetes, obesity, sedentary lifestyles, tamoxifen usage for breast cancer, early menarche, and late menopause may all contribute to the rise in endometrial cancer cases (8). Gestational trophoblastic disease encompasses a range of gestation-related diseases, extending from the benign condition of hydatidiform mole to the malignant conditions of choriocarcinoma, invasive mole, and placental-site trophoblastic tumor. The availability of a highly sensitive tumor marker in the form of beta Human Chorionic Gonadotropin, along with the highly chemo-sensitive nature of the disease and good survival rates, have been achieved thanks to the accessibility of effective chemotherapy (7). Vulva cancer is an uncommon condition that makes up 3%–5% of gynecological malignancies globally and is nonetheless a serious condition that affects sexuality (10). Primary vaginal cancer is less frequent and occurs in 1 in 100,000 women.

As is already widely known, cancer is a significant public health issue in developing nations, including Africa, but its incidence and mortality are also rising quickly globally for a variety of complex reasons that include aging populations, population growth, changes in the prevalence and distribution of the main risk factor for cancer, and a variety of other factors (5).

A cancer prevention program should be prioritized in every population based on information about cancer and an understanding of its distribution pattern. In most African nations, including our own, there are no easily available statistics on the prevalence of gynecological cancer (6).

2.2 STATEMENT OF THE PROBLEM

Gynecologic cancers form a huge burden of morbidity and mortality around the world (8). Gynecological cancers account for about 10% of new cancer cases in women and 12% of cancer deaths worldwide (4). Patients in low- and middle-income nations are disproportionately affected by cancer; in these nations, 70% of newly diagnosed cancer cases occur, and the survival rate for cancer is 30% to 50% lower than in high-income nations (1).

In 2012, there were an estimated 14.1 million new cancer cases diagnosed worldwide (excluding non-melanoma skin cancers) and 8.2 million estimated deaths. In Africa, cancer is emerging as a critical public health problem. In 2008, there were an estimated 715,000 new cancer cases and 542,000 cancer deaths in Africa [3]. In sub-Saharan African countries, cancers of the breast (25.2%), cervix (25.2%), and colorectal (3.7%) are the most common in women. Like other sub-Saharan countries, the incidence of cancer is rising in Ethiopia, too. According to the data from Black Lion Hospital's radiotherapy center, where two-thirds of patients seen are from different regions of the country, the commonest cancer in women is cancer of the cervix, breast, and colorectal (20).

Gynecological malignancies have a greater financial and social impact on women, their families, and communities than other types of cancer of the body because they disproportionately afflict women of reproductive age. Gynecological malignancies have consequently become significant challenges for women's public health, with more women seeking cancer treatment (9).

These cancers have a tremendous physical, emotional, and socioeconomic impact on the affected person and society at large. They cause symptoms including irregular vaginal bleeding, pelvic discomfort, bowel or urine problems, and sexual problems. The quality of life for women both during and after treatment may be impacted by these impacts. They have a greater impact than other types of malignancies of the body locations, affect more women of reproductive age, and have a negative financial and social impact on women, their families, and communities. As a

result, gynecological malignancies have grown to be significant problems for women's public health, and more women are seeking cancer treatment. On the other hand, those who cannot afford the therapy have a far higher chance of dying (9).

The burden of cancer incidence and mortality is rapidly growing worldwide and has become an important barrier to increasing life expectancy. Ethiopia's cancer incidence is increasing, as is the situation in other sub-Saharan nations. It is predicted that there will be roughly 77,352 new cancer cases in Ethiopia by the year 2020 (1).

However, because cancer is a complex and diverse illness, there are changes in the patterns of incidence based on underlying cancer risk factors such as lifestyle and environmental variables. According to studies, there is an increase in cancer in economically developing nations due to fast population expansion, a longer life expectancy, the adoption of hazardous lifestyles, and adjustments in reproductive patterns. The burden of cancer is considerably increased by behaviors and practices that are associated with higher cancer rates, particularly in economically developing countries (1, 11).

The pattern of gynecological cancers varies throughout various geographical locations due to changes in genetic makeup, environment, way of life, nutrition, socioeconomic background, education, awareness, healthcare system, and screening. There are variations in death rates throughout the world. The distribution of cancers and death rates may vary depending on lifestyle, eating habits, education, public awareness, the health care system, and screening programs (7, 12).

The epidemiologic and clinical areas that should be concentrated on and further explored can be clarified by studying cancer incidence patterns. A clinician can give decision-makers more insight when contemplating appropriate measures. It is possible to effectively manage gynecologic malignancies by identifying areas with high and low incidence risks. Additionally, discovering and quantifying trend changes in incidence in mysterious illness risk variables might help us comprehend the geographical organization of unmeasured confounding factors. As a result, the current study's major objectives will be to examine the key trends in the prevalence of gynecological malignancies (13).

2.3 SIGNIFICANCE OF THE STUDY

Understanding the incidence and prevalence of gynecological cancer in people of all ages is crucial to reducing the number of new diagnoses and improving treatment for cancer. Although histopathological examination of tissue specimens is thought to be the most conclusive test for the diagnosis of malignancy, it is seen that identification of certain epidemiological factors and warning signs of gynecological malignancies may be helpful in the early diagnosis of these cancers. However, despite such a frequency and incidence, there is a lack of knowledge and data regarding this condition (10, 14).

The lack of precise demographic and health data is one of the biggest issues in developing nations. Similar to other sub-Saharan countries, in Ethiopia, there is no national cancer registry that provides estimates of the country's cancer distributions and patterns. As a result, it is impossible to accurately determine the incidence rates of different tumors. In these situations, relying on relative frequencies in hospitals as a gauge of tumor incidence is necessary to establish priorities for disease control, and an evaluation of the burden of cancer is useful (15).

The purpose of this study will be to identify the sociodemographic traits of the participants and the histological patterns of the gynecological cancers observed at the teaching hospital of Addis Ababa University, Tikur Anbessa Hospital. The results of this study will be useful in reducing the threat of gynecological cancer through screening programs, health education, and effective resource allocation. Planning and policy choices in the area of health might be significantly impacted by this.

3. LITERATURE REVIEW

With roughly 14 million new instances of cancer being diagnosed and 8 million deaths from cancer-related causes globally in 2012, cancer is a major source of morbidity and mortality. The genital tract is involved in gynecological cancers, which also include malignancies of the ovary, cervix, uterus, vulva, vagina, and gestational trophoblastic malignancies. Cervical, endometrial, and ovarian cancers are the three main gynecologic malignancies.

In one retrospective study performed in the department of obstetrics and gynecology malignancies at a tertiary care hospital in Karachi from January 2020 to December 2021, which aimed to view the current clinicopathological pattern of gynecological malignancies, 164 cases of suspected gynecological malignancies, among which 42 histopathologically confirmed cases, were selected for study. Confirmed gynecological cancer accounts for 4.7% of all gynecological admissions, and in this study, ovarian cancers were the commonest gynecological malignancy (54.7%), followed by cervical cancer (19.04%), uterine cancer (16.66%), and vulvar and vaginal cancers (9.5%). In ovarian cancers, epithelial cancers were (86.9%) and (13.04%) non-epithelial. In cervical cancer, 100% were squamous cell carcinomas. In the uterus, 85.7 percent were adenocarcinomas, and 14.28% were leiomyosarcomas. In vaginal cancers, 50% were squamous cell carcinoma and 50% were melanoma. In vulvar cancers, all (100%) were squamous cell carcinomas. Finally, this study concluded that ovarian cancer was the most common gynecological malignancy. The common age group, parity, clinical presentation, and histopathology are comparable with studies. The majority of cases came late in the advanced stage of the disease (16).

In another retrospective-design study, research was carried out on different age groups in the Al-Madinah Al-Munawarah region from June 2015 until June 2021, and a total of 200 specimens diagnosed with female genital tract malignancy were found to satisfy the necessary details on demographic information. The specimens were obtained from women with a mean age of 54.40±16.1 years. Genital tract malignancies were found mostly in the uterus (69%), cervix (13.5%), and ovaries (13.5%). The majority were tumors of the uterine corpus, and the least common were gestational trophoblastic neoplasms (1.5%), and these studies concluded that most of the cancer incidences, regardless of the pathological diagnosis, either increased or remained unchanged over time, which is a possible indication of the current state of health programs and information available to citizens. The mean ages for ovarian cancer, uterine cancer, and vulvar cancer are 34.8, 58.47, and 59.4, respectively (11).

In a multicentric retrospective observational study done at four major pathology departments in the Jaipur region of Rajasthan, a total of 2554 female patients with gynecological malignancies were recorded. The most common genital tract malignancy was cervical cancer (n = 1325; 51.8%), followed by ovarian cancer (n = 580; 24.6%), uterine cancer (n = 450; 17.6%), and

vaginal cancer (n = 101; 3.96%). Cancer of the vulva (n = 49; 1.9%), endometrium cancer (n = 36; 1.4%), and fallopian tube cancer (n = 12; 4.7%) were other genital tract cancers reported at these institutes, while in one case malignancy in the placenta was also observed. This study concluded that cervical carcinoma is the most common female genital tract malignancy, followed by ovarian carcinoma and uterine cancer. The squamous type of cervical cancer was the most common. Hospital facilities for screening, regular gynecological examinations, and a well-defined follow-up surveillance system can change disease morbidity and mortality (17).

In a hospital-based retrospective observational study of histopathologically confirmed gynecological malignancies conducted in the department of Obstetrics and Gynecology, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, for 3 years from April 2016 to March 2018, which involved 314 cases, the most common gynecological malignancy was the ovary (50.63%), followed by the cervix (30.25%), endometrium (9.23%), (4.77%), gestational trophoblastic neoplasia (3.82%), and fallopian tube (1.27%). 71% of the gynecological malignancies presented in the early stages and 29% in the late stages. The mean age of gynecological malignancy was 49.06 + 10.08 years, and the conclusion was that screening for gynecological malignancy is necessary to identify the disease in its early stages to decrease maternal morbidity and mortality (3).

Another retrospective analysis of all the cases of female gynecological malignancies presented was carried out, aiming to find out the pattern of female gynecological malignancies in Pakistan and provide the basis for the development of preventive strategies to combat the current trend. Among gynecological cancers, ovarian cancer (47.1%) is the most common, followed by cervical cancer (24.8%), uterine cancer (11.6%), gestational trophoblastic neoplasia (12.9%), vaginal cancer (2%), and vulvar cancer (1.6%). reflecting that gynecological malignancies constitute a major portion of female malignancies, and it concluded by suggesting that the need of the hour should be designing effective preventive and control strategies so as to lower the burden of female gynecological malignancies in the future (7).

There was also one retrospective study carried out in the Obstetrics and Gynecology department of the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria, between January 2012 and December 31, 2016, and in this study, out of 3786 women admitted during the study period, 113 had gynecological malignancies, giving an incidence of 3.0%. The majority of the women had cervical cancer (65.5%), followed by ovarian cancer (22.1%). Endometrial cancer, choriocarcinoma, and vulva cancer accounted for 7.1, 4.4, and 0.9%, respectively, which suggested cervical carcinoma is the most common gynecological malignancy and squamous cell carcinoma is the most common histological type seen. The most common ovarian cancer in this study is the epithelial type, of which serous cystadenocarcinoma is the most common variety. The age group 50–59 has the highest number of patients with 28.3%, followed by the age group ≥60 with 23.9%. The mean age for the various female genital cancers was: cervical cancer (52.6 ± 0.88 years), ovarian cancer (40.9 ± 1.68 years), vulva cancer (34.5 ± 0 years), choriocarcinoma (30.5 ± 1.44 years), and endometrial cancer (54.5 ± 1.77 years). It is essential to prioritize education and public awareness campaigns in order to regularly test for and treat premalignant lesions in the female genital tract. Facilities for screening, regular gynecological examinations, and a well-defined follow-up surveillance system can change the rising trend of female genital malignancies (4).

In one retrospective descriptive study of patients admitted for gynecological cancers at UATH, Abuja, over a 5-year period from January 1, 2014, to December 31, 2018, which involved 167 gynecological cancer cases among 3030 gynecological admissions during the study period, its prevalence was put at 5.5%. The most common site for genital malignancy was the cervix (52.7%), followed by ovarian cancer (28.1%), endometrial cancer (10.2%), choriocarcinoma (6.6%), and vulva cancer (2.4%). The majority (60.5%) of the gynecological cancer cases presented at the advanced stages of the disease (43.1% at stage 3 and 17.4% at stage 4). The mean age for cervical carcinoma patients (55.50 ± 12.71 years) was higher than that of uterine cancer (50.54 ± 515.18 years) and ovarian cancer (42.34 ± 14.91 years), but lower than vulva cancer (63.50 ± 15.09 years). No case of vaginal cancer was seen within the period, and this study concluded that cervical cancer remains the most common gynecological cancer. Fortunately, the incidence is currently showing a downward trend, probably due to improvements in cervical screening exercises. It is followed by ovarian cancer, which is a major

cause of case fatality, and the preponderance of gynecological cases presenting in advanced stages. Thus, education and public enlightenment on routine screening and treatment of premalignant lesions in female genital tract malignancies are the way forward (10).

In a retrospective observational study carried out in the Gynecology Department of Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria, between October 2008 and September 2011, the pattern of gynecological malignancies was studied. There were 249 women found to have gynecological malignancies, and out of these, most (48.6%) had cervical cancer, followed by ovarian cancer (30.5%), endometrial cancer (11.25%), and choriocarcinoma (9.24%). The conclusion was that efforts should be made to address estimates of these important public health problems in various regions (18).

Also in a hospital-based retrospective observational study of histopathologically confirmed gynecological malignancies conducted in the department of Obstetrics and Gynecology, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, for 3 years from April 2016 to March 2018. Among the 314 cases enrolled in the study, the most common gynecological malignancy was of the ovary (50.63%), followed by the cervix (30.25%), endometrium (9.23%), 4.77%, gestational trophoblastic neoplasia, and fallopian tube (1.27%). 71% of the gynecological malignancies presented in the early stages and 29% in the late stages. Screening for gynecological malignancy is necessary to identify the disease in its early stages and decrease maternal morbidity and mortality. The mean age of gynecological malignancy was 49.06 + 10.08 years. The common gynecological cancer was ovarian, followed by cervical and endometrial, and the common histopathology was serous adenocarcinoma in the ovary, squamous non-keratinizing in the cervix, and endometrioid adenocarcinoma in the endometrium. The study also showed that 25.26% of cervical cancer cases were in stage 1, 37.89% in stage 2, and 36.84% in stage 3. Gestational trophoblastic neoplasia was found at 66% in stage 1 (3).

In a retrospective review of the characteristics of 2,002 female cancer patients who visited the Oncology Unit of Saint Paul's Hospital Millennium Medical College from 2014–2018 to characterize gynecological and breast cancers among clients attending the Gynecologic Clinic of Saint Paul Hospital Millennium Medical College over a 5-year period, cervical (46.7%) was the most frequent cancer, followed by breast (29.3%) and ovarian cancers (13%). Squamous cell

carcinoma of the cervix is the most commonly observed histolopathologic type. In this study, they found out that breast and gynecologic cancers are important public health problems among women in Addis Ababa and that the number of patients seeking care for these cancers is increasing. (19).

In another retrospective cross-sectional review at Hawassa University Comprehensive and Specialized Hospital (HUCSH) from 2013 to 2019, out of all 3002 cancer cases, 522 (17.4%) cases of gynecological cancer were identified in 7 years. Cervical cancer accounted for 385 (73.8%) of all gynecological cancers in this study; the next most common gynecological cancers were ovarian cancer at 55 (10.5%) and endometrial cancer at 51 (9.8%), respectively. The mean (SD) age was 44.84 (12.23). The most common histological type was squamous cell carcinoma, which accounted for 206 (65.2%) of all cases, followed by adenocarcinoma, which accounted for 110 (34.8%). 7.8% of patients with cervical cancer presented as stage I–IIA. The trends for all identified gynecological cancers showed continuous increments in caseload from year to year. Since 2016, the increase in cervical cancer has been drastically vertical compared with others. This study concluded that despite the limited use of a registration and referral system in primary health institutions, the burden of gynecological cancers has increased over time. Treatment steps should be taken as soon as possible after a cancer diagnosis to prevent the disease from progressing. (9)

In another retrospective study that was done at the department of pathology at Bp koirala Memorial Cancer Hospital from 1999 to 2004, there were a total of 1517 cases of gynecologic malignancy, of which 85.23% were cervical cancer and 6.39% were ovarian cancer. 3.16% of them were vulvar cancer, 2.7% of them were vaginal cancer, 2.11% of them were endometrial cancer, and 0.33% of them were choriocarcinoma. Squamous cell carcinoma was the commonest histology type in cervical vulvar and vaginal cancer, whereas serous adenocarcinoma and endometroid adenocarcinomas were the commonest histology types in ovarian cancer and endometrial cancer, respectively. (21)

4. OBJECTIVE

4.1 GENERAL OBJECTIVE

- ✓ To determine the pattern and relative frequency of different types of gynecological malignancies at Tikur Anbessa specialized hospital

4.2 SPECIFIC OBJECTIVE

- ✓ To determine the demographic characteristics of each malignancy
- ✓ To determine the pattern of gynecological neoplasms.
- ✓ To identify the most common type of gynecological malignancy.
- ✓ To analyze the relative frequency of each malignancy in relation to the other.
- ✓ To assess the presenting clinical symptom and staging of each malignancy at diagnosis.

5. METHODS & MATERIAL

5.1 STUDY DESIGN AND PERIOD

An hospital-based retrospective design study was carried out from September 2020 – September 2023 G.C.

5.2 Study area

The study was done at Tikur Anbessa specialized hospital (TASH), a teaching university hospital in Addis Ababa, Ethiopia. Tikur Anbessa specialized hospital is the largest tertiary referral and teaching center of Addis Ababa University. It has its own gynecologic ward in which inpatient service, including daycare and surgical intervention by a multidisciplinary team led by a gynecologic oncologist and clinical oncologist, will be provided, and an average of 800 outpatients will visit the gynecologic OPD monthly. The study was conducted from September 11, 2020, to September 10, 2023.

5.3 STUDY POPULATION

The study population comprised all the patients who were diagnosed with gynecological cancer and managed at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, during the study period.

5.4 ELIGIBILITY CRITERIA

- **Inclusion criteria**
  - ✓ The inclusion criteria of the study were all patients with gynecological cancer with a complete available date or variable of interest within the study period.
- **Exclusion criteria**
  - ✓ The exclusion criteria of the study were those patients whose data or variable of interest was not complete during data collection and those without histological diagnoses.

5.5 SAMPLING TECHNIQUE

All patients who were diagnosed with gynecologic cancer during the study period and fulfill the criteria were included.

5.6 STUDY VARIABLES

Dependent variable:

Pattern and relative frequency of gynecological malignancy

Independent Variables:

- ✓ Age
- ✓ Parity
- ✓ Histopathological result
- ✓ Clinical presentation
- ✓ Duration of clinical presentation
- ✓ staging

5.7 DATA COLLECTION TOOLS AND PROCEDURES

A structured questionnaire was prepared in English, and data was collected mainly from the HMIS registration book, patient charts, the OR log books, and histology results from the pathology department at Tikur Anbessa Specialized Hospital, if not available in the chart. The questionnaire assessed sociodemographic characteristics, staging, clinical presentation, histopathology results, and serum HCG levels collected by researchers (trained interns and residents) from the data source.

5.8 DATA QUALITY ASSURANCE

The data collectors were trained for one day on the objectives and purpose of the study and data collection procedures. The data collection was done through a structured questionnaire, and supervision was done by the principle investigator for completeness and keeping it for analysis.

5.9 DATA PROCESSING AND ANALYSIS

After data collection, each questionnaire was checked for completeness based on the code given during data collection. Data was entered into the SPSS version 25 statistical package. The coding of individual questionnaires was checked before data entry into the software. Further, data cleaning was performed to check for outliers, missed values, and any inconsistencies before the data are analyzed using the software. Descriptive statistics like frequency tables, graphs, and summaries were used to describe the independent variables.

6. RESULT

6.1 Sociodemographic characteristics of the study participants

In this study, 1993 charts were reviewed from September 11, 2020, to September 10, 2023, and 27.8% of the participants were in the age group of 51–60 years with a mean age of 51.2 years. From the 141 records, 42.6% of the participants were married below the age of 18 years, and from the 573 records, 91.4% of the participants entered menopause at the age of ≤52 years. Half of the participants were grand multiparous, and 5.2% of the participants had a history of abortion. Of those who had a history of abortion, 52.4% had only one abortion. Almost twenty-

nine percent of the participants had a history of comorbid disease, and of those with comorbid disease, 51% had RVI, followed by hypertension (36.5%) and DM (15.5%).

Table 1. The sociodemographic characteristics of the study participants having gynecological cancer at TASH.

variable	frequency	Percent
Age in years		
18-30	97	4.9
31-40	337	16.9
41-50	527	26.4
51-60	554	27.8
61-70	371	18.6
>70	107	5.4
Age at marriage(n=141)		
<18	60	42.6
≥18	81	57.4
Age of menopause (n=573)		
≤52	524	91.4
>52	49	8.6
Parity		
Nulliparous	139	7
Parous(1-5)	850	42.6
Grand multiparous(>5)	1004	50.4
History of abortion		
Yes	103	5.2
No	1890	94.8
Number of abortion (n=103)		
One	54	52.4
Two and above	49	47.6
Presence of comorbid illness		
Yes	573	28.8
No	1420	71.2
The list of comorbid disease (n=573)		
Known HIV Patient	292	51
Hypertension	209	36.5
DM	89	15.5
Asthma	29	5.1
DVT	5	0.9
Cardiac	17	3
Thyroid disease	13	2.3
Psychiatric and epilepsy	7	1.2
TB	2	0.3
Previous history of breast colon endometrial cancer		

Yes	12	0.6
No	50	2.5
unknown	1931	96.9
Types of breast colon endometrial cancer (n=12)		
Breast cancer	7	58.3
Cervical cancer	1	8.3
CIN3	2	16.7
Colon cancer	1	8.3
Endometrial cancer	2	16.7

6.2 The characteristics of presenting compliant in relation to each gynecologic malignancy

More than half (51.6%) of the study participants complained of irregular bleeding, followed by abnormal vaginal discharge (25.6%) and abdominal pain (9.2%). Almost 50.1 percent of the participants had less than 6 months of presenting symptoms, and 40.8% of the cases were diagnosed in 2014EC.

Table 2. The distribution of presenting compliant among study participants to the health facility

Presenting compliant(n=1993)	Frequency	Percent
Irregular vaginal bleeding	1131	56.8
Abnormal vaginal discharge	510	25.6
Vulvar itching	28	1.4
Abdominal pain	184	9.2
Post-surgery follow up	148	7.4
Vulvar swelling	48	2.5
Abdominal swelling	16	0.8
Urinary symptom	13	0.7
Abdominal distention	14	0.7
For screen	8	0.4
Amenorrhea	13	0.7
Duration of symptoms in months		
<6	999	50.1
6-12	786	39.4
13-24	132	6.6
>24	76	3.8

Year of diagnosis		
2013	554	27.8
2014	814	40.8
2015	625	31.4

6.3 The patterns of gynecologic malignancy

Most of the participants had cervical cancer (83%), followed by ovarian cancer (5%), gestational trophoblastic neoplasm, vulvar, and uterine cancer. The least common gynecological cancer was vaginal cancer.

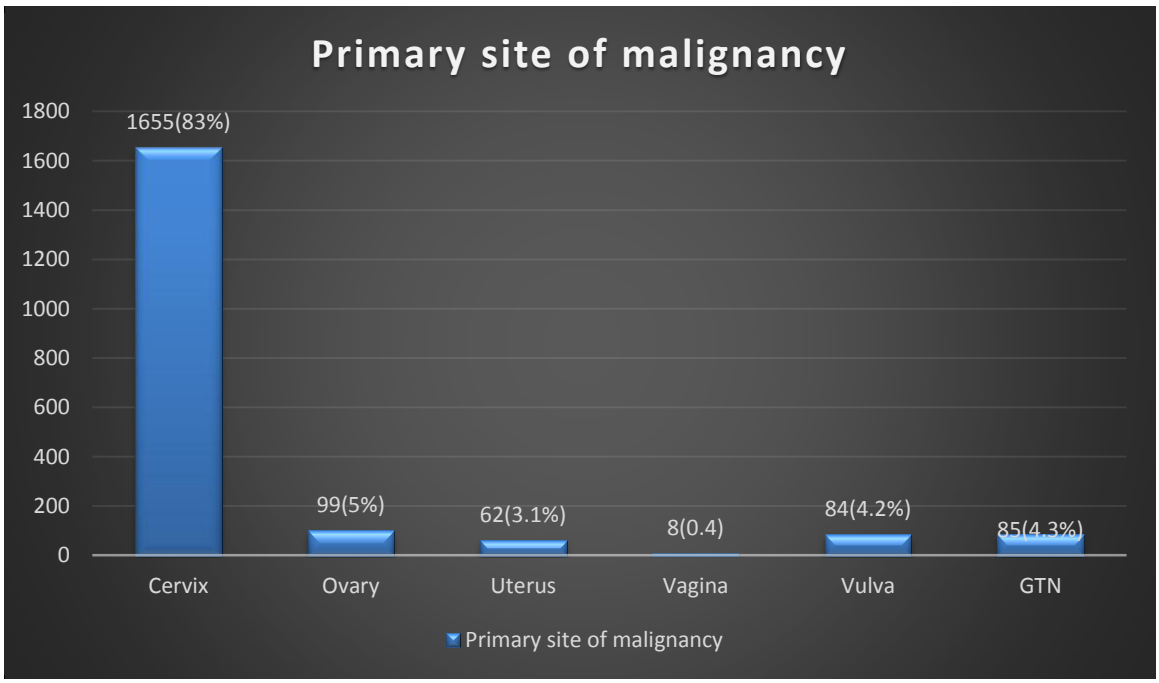

Figure1.The primary site of the malignancy.

6.4 The clinical characteristics of cervical cancer

There were a total of 1655 cervical cancer patients, among whom histology was obtained from cervical diagnostic procedures like punch biopsy, cone biopsy, and others, surgical biopsy, or both. From all 1655 cervical cancer patients, squamous cell carcinoma constituted 90% of the cervical cancer burden in this study, followed by adenocarcinoma (6.3%), and then

adenosquamous carcinoma (1.3%). Out of all cervical cancer patients, one hundred forty-three had histopathology results from a surgical biopsy, of which 81.1% had squamous cell carcinoma and 11.9% had adenocarcinoma. From those with previous cervical diagnostic procedures (1603), 922 were punch biopsy, 672 were not specified, and the remaining were cone biopsy, ECC, and LEEP. Of all the histology results obtained from this cervical diagnostic procedure, 90.3% of the participants had squamous cell carcinoma, followed by adenocarcinoma (5.9%) and adenosquamous (1.3%).

Table3.The histopathology distribution of cervical cancer among study participants with cervical cancer.

variable	frequency	Percent
Histopathology result after surgery (n=143)		
Squamous cell carcinoma	116	81.1
Adenocarcinoma	17	11.9
Aden squamous carcinoma	4	2.8
CIN 3	6	4.2
Lymphadenectomy specimen(n=17)		
Regional nodes (pelvic or Para aortic)	16	94.1
Sentinel node	1	5.9
Previous cervical diagnostic cervical procedure performed(n=1603)		
Punch biopsy	922	57.5
Not specified	672	42
Cone biopsy	3	0.2
ECC	4	0.3
LEEP	2	0.1
Result of the Previous diagnostic cervical procedure performed (n=1603)		
Squamous cancer	1447	90.3
Adenocarcinoma	95	5.9
Adeno-squamous	20	1.3

Poorly differentiated carcinoma	13	0.7
CIS	20	1.3
CIN3	8	0.5

6.5 Endometrial cancer related characteristics of the study participants

There were a total of 62 uterine cancers, of which 56 were endometrial cancers and the rest were uterine mesenchymal tumors, and the histopathology results were obtained from a surgical biopsy (17), an endometrial biopsy (24), or both (15). Of the 56 endometrial cancers, thirty-two participants had recorded endometrial cancer from a surgical biopsy, of which endometrioid accounts for 75%, followed by serous (18.8%), clear cell (3.1%), and carcinosarcoma (3.1%). There were a total of 52 endometrial biopsys done during the study period, of which 41 resulted in the diagnosis of uterine cancer, and the remaining 11 resulted in the diagnosis of both cervical and uterine cancer. From those 41 endometrial biopsys, 47% of the participants had endometrioid and 11.8% had serous carcinoma. Of the six uterine cancers, 33.3% had leiomyosarcoma and 33.3% had mixed-cell carcinoma. Fifteen participants had histologic grading, and of those who had histologic grading, Grade III and Grade II accounted for 40% each, followed by Grade I.

Table 4. Histopathology and grading distribution of the study participants who have uterine cancer

variable	frequency	Percent
Histopathology type after surgery(n=32)		
Endometrioid	24	75
Serous	6	18.8
Clear cell	1	3.1
Carcinosarcoma	1	3.1
Histologic grading (n=15)		

I	3	20
II	6	40
III	6	40
Result of endometrial biopsy (n=51)		
Serous EIC	1	2
Adenocarcinoma	3	5.9
Aden squamous	1	2
Carcinosarcoma	4	7.8
Endometrial SCC	1	2
Endometrioid	24	47
Mucinous	2	3.9
Non diagnostic	1	2
Poorly differentiated carcinoma	3	5.9
Serous	6	11.8
Squamous cell carcinoma	5	9.6
Undifferentiated	1	2
Histologic grading (n=12)		
Grade 1	7	58.3
Grade 2	2	16.7
Grade 3	3	25
Uterine Mesenchymal cancers(n=6)		
Alveolar rhabdomyosarcoma	1	16.7
Endometrial stromal sarcoma	1	16.7
leiomyosarcoma	2	33.3
Mixed cell carcinoma	2	33.3

6.6 Ovarian cancer histopathology related characteristics of the study participants

Of those who had ovarian cancer (n = 99), 76.8% (n = 76) of participants had epithelial cell cancer. From those with epithelial cancer, 67% had serous epithelial cancer, followed by mucinous epithelial cancer (14.5%), carcinosarcoma (5.3%), and adenocarcinoma (5.3%). The finding also showed that 6 and 17 participants had germ cell and sex cord stromal tumors, respectively.

Table5. Ovarian cancer histopathology-related characteristics of the study participants

Variable	frequency	Percent
Epithelial cells(n=76)		
Endometrioid	2	2.6
Adenocarcinoma	4	5.3
Brenner	1	1.3
Carcinosarcoma	4	5.3
Clear cell carcinoma	1	1.3
Differentiated carcinoma	1	1.3
Infiltrate of carcinoma	1	1.3
Mucinous	11	14.5
Serous	51	67
Urothelial carcinoma	1	1.3
Germ cell (n=6)		
Dysgerminoma	2	33.3
Immature teratoma	2	33.3
Yolk sac tumor	2	33.4
Sex cord stromal tumors (n=17)		
fibroma	5	29.4
Fibro thecoma	1	5.9
Granolas cell tumor	6	35.3
pure sex cord tumor	3	17.6
Sclerosing stromal tumor	1	5.9
Sertoli cell tumor	1	5.9
Sertoli lading cell tumor	1	5.9

6.7 Vulvar and vaginal cancer related characteristic of the study participants

The table below shows that 84 patients had vulvar cancer, which accounts for 4.2% of the gynecologic malignancy. 96.4 percent of the vulvar cancers were squamous cell carcinoma, and half of the vaginal cancers were squamous cell carcinoma, as shown in the table below.

Table6. Vaginal cancer related characteristics of the study participants

variable	frequency	Percent
Vulvar cancer (n=84)		
Non squamous cell carcinoma	3	3.6
Squamous cell carcinoma	81	96.4
Vaginal cancer histopathology		
Non squamous cell carcinoma	4	50
Squamous cell carcinoma	4	50
Site		
Primary	6	75
secondary	2	25

6.8 GTN related characteristics of the study participants

From those with GTN (n = 85), 16.5% of the participants had choriocarcinoma, followed by complete mole (15.3%) and partial mole (11.8%). The findings of the study also showed that 85.9% of the participants were treated with chemotherapy, followed by 14.1% treated with both chemotherapy and surgery. 65.9% of the GTN had a WHO score of low risk, 28.2% were high risk, and 5.9% were ultra-high risk.

Table7. GTN-related characteristics of the study participants

variable	frequency	Percent
GTN histopathology type (n=85)		

Choriocarcinoma	14	16.5
complete mole	13	15.3
Invasive mole	10	11.8
partial mole	10	11.8
Placental site trophoblastic tumor	1	1.2
Unknown	37	43.5
Treatment for GTN(n=85)		
Chemotherapy	73	85.9
Surgery and chemotherapy	12	14.1
Staging for GTN(n=85)		
Low risk	56	65.9
High risk	24	28.2
Ultra-high risk	5	5.9

6.9 The relation between demographic characteristics and gynecological malignancy

In this study, the majority of cervical cancer (30.7%) was diagnosed at the age of 51–60 years, the majority of ovarian cancer (27.3%) was diagnosed at 41–50 years, the majority of uterine cancer (45.2%) was in the age group of 61–70 years, the majority of vaginal cancer (37.5%) was in the age group of 61–70 years, and the majority of the GTN were in the age group of 18–30 years.

Concerning the relation of gynecological malignancy with parity, the majority (56.1%) of cervical cancer was grand-multiparous, the majority (31.3%) of ovarian cancer was multiparous, and the majority of uterine cancer was multiparous. The finding also revealed that fifty-six percent of the cervical cancer patients presented with irregular vaginal bleeding, 43.4% of ovarian cancer presented as post-surgery, 62.5% of vaginal cancer presented with abnormal vaginal discharge, 51.1% of vulvar cancer presented with vulvar swelling, and 68.2% of GTN presented with irregular vaginal bleeding. The majority of the gynecological malignancy was diagnosed within six months of clinical symptoms, as shown in Table 10 below.

Table 8. The clinical characteristics of all gynecological malignancy in relation to age, parity, presenting symptom and duration of illness.

Variable	Types of gynecologic malignancy						
	Cervix (%)	Ovary (%)	Uterus (%)	Vaginal (%)	Vulvar (%)	Placenta (%)	Total

Age in years							
18-30	35(2.1))	16(16.2)	1(1.6	0(	5(5.9)	40(47.1)	97(4.9)
31-40	244(14.7)	24(24.2)	8(12.9	1(12.5)	26(30.9)	34(40)	337(16.9)
41-50	455(27.5)	27(27.3)	11(17.7	3(37.5)	21(25)	10(11.8)	527(26.4)
51-60	508(30.7)	21(21.2)	12(19.4	0(	12(14.3)	1(1.2)	554(27.8)
61-70	318(19.2)	9(9.2)	28(45.2	3(37.5)	13(14.5)	0	371((18.6)
>70	95(5.7)	2(2.)	2(3.2	1(12.5)	7(8.3)	0	107(5.4)
Parity							
Nulliparous	67(4.1)	31(31.3))	8(12.9)	0	16(19.1)	17(20)	139(7)
primiparous	117(7.1)	19(19.2)	9(14.5)	1(12.5)	26(30.9)	18(21.2)	190(9.5)
multiparous	542(32.7)	31(31.3)	26(41.9)	4(50)	25(29.8)	32(37.6)	660(33.1)
grand multiparous	929(56.1)	18(18.2)	19(30.6)	3(37.5)	17(20.2)	18(21.2)	1004(50.4
Comorbid disease							
RVI	231(13.9)	4(4)	5(8.1)	3(37.5)	79(94)	0	292(14.6)
HTN	176(10.6)	10(10.1)	16(25.8)	0	7(8.3)	0	209(10.5)
DM	66(4)	4(4)	14(22.6)	0	5(5.9)	0	89(4.5)
Asthma	24(14.5)	0	0	0	0	0	29(1.5)
cardiac	13(0.8)	0	4(6.5)	0	0	0	17(0.9)
epilepsy	3(0.2)	2(2)	0	0	1(1.2)	1(1.2)	7(0.4)
TB	2(0.1)	0	0	0	0	0	2(0.1)
Presenting complains							
Irregular vaginal bleeding	1031(62. 6)	1(0.1)	38(53.7)	0	3(3.6)	58(68.2)	1131(56.8)
Abnormal vaginal discharge	488(29.5)	1(0.1)	7(11.3)	5(62.5)	7(8.3)	2(1.9)	510(25.6)
Itching	3(0.2)	0	0	0	25(29.8)	0	28(1.4)
Abdominal pain	137(8.3)	33(33.3)	7(11.3)	1(12.5)	1(1.2)	8(5.9)	184(9.2)

Post-surgery	70(4.2)	43(43.4)	12(12.1)	3(37.5)	5(5.9)	15(17.6	148(7.4)
Vulvar Swelling	1(0.06)	0	1(1.6)	0	44(52.3)	1(1.2)	48(2.5)
Abdominal swelling	0	15(15.1)	0	0	0	1(1.2)	16(0.8)
Urinary symptom	13(0.8)	0	0	0	0	0	13(0.7)
Abdominal distention	0	13(13.1)	0	0	0	1(0.9)	14(0.7)
Duration of symptom							
<6	786(47.5)	71(71.7)	35(56.4)	3(37.5)	23(27.4)	81(95.3)	999(50.1)
6-12	704(42.5)	22(20.2)	18(29)	3(37.5)	35(41.7)	4(4.7)	786(39.4)
13-24	110(6.6)	4(4.0)	7(11.3)	1(12.5)	10(11.9)	0	132(6.6)
>24	55(3.3)	2(2.0)	2(3.2)	1(12.5)	16(19)	0	76(3.8)

6.10 The relation between year of diagnosis, staging, and site of primary malignancy

In all three years of assessment, the majority of cervical cancers were stage III, and the majority of GTNs were stage I. On the other hand, stage three gynecological malignancy accounts for 34.3% of the total of 1993 participants. From those with clinical and surgical staging, 37.2%, 24.2%, and 16.1% of cervical cancer, ovarian cancer, and uterine cancer were stage III, respectively. On the other hand, 82.4% of placenta cancers were stage I, and 29.8% of vulvar cancers were stage 2 at the time of diagnosis, as shown below.

Table 9. The relationship between year of diagnosis, staging, and site of primary malignancy

staging * Primary site of malignancy * Year of diagnosis									
Year of diagnosis			Primary site of malignancy						Total
			cervix	ovary	uterus	vagina	vulva	GTN	
2013	Clinical and surgical stage	not stage	115	22	10	3	6	0	156
		I	22	2	1	0	6	22	53
		II	144	1	1	0	9	3	158
		III	152	7	2	1	7	0	169

		IV	13	2	0	0	1	2	18
	Total		**446**	**34**	**14**	**4**	**29**	**27**	**554**
2014	Clinical and surgical stage	not stage	126	26	8	1	3	0	164
		I	45	7	9	0	7	29	97
		II	196	1	0	0	5	1	203
		III	272	7	8	0	7	5	299
		IV	41	4	0	0	4	2	51
	Total		680	45	25	1	26	37	814
2015	Clinical and surgical stage	not stage	59	7	9	2	1	2	80
		I	40	2	6	0	6	19	73
		II	178	0	0	0	11	0	189
		III	192	10	6	1	7	0	216
		IV	60	1	2	0	4	0	67
	Total		529	20	23	3	29	21	625
	Clinical and surgical stage	not stage	300	55	27	6	10	2	400
		I	107	11	16	0	19	70	223
		II	518	2	1	0	25	4	550
		III	616	24	16	2	21	5	684
		IV	114	7	2	0	9	4	136
	Total		1655	99	62	8	84	85	1993

6.11 Treatment related characteristics of gynecological malignancy

The majority of the study participants had no recorded treatment rather than planned for treatment. In all gynecologic malignancies, with the exception of GTN patients, 26.3% of the study participants received chemotherapy, and 10.5% of the participants were managed surgically. 6.7% of the participants received both chemotherapy and radiotherapy.

The majority of treatments for cervical cancer were chemotherapy (28.3%, n = 468); for ovarian cancer, the majority of treatments were surgery followed by chemotherapy (46.9%, n = 46); for uterine cancer, surgery (32.3%, n = 20); for vaginal cancer, chemotherapy (37.5%, n = 3); and for vulvar cancer, surgery (38.1%, n = 32), as shown in the table below.

Table10. Treatment related characteristics of gynecological malignancy

treatment list * Primary site of malignancy * Year of diagnosis								
Year of diagnosis			Primary site of malignancy					Total (%)
			Cervix (%)	Ovary (%)	Uterus (%)	Vagina (%)	Vulva (%)	
2013	treatment list	chemotherapy	155(34.8)	6(17.6)	3(21.4)	2(50	5(17.2)	171(32.4)
		Chemotherapy and Radiation	35(7.8)	0	1(7.1)	0	3(10.3)	39(7.4)
		chemotherapy then surgery	3(0.7)	5(14.7)	0	0	0	8(1.5)
		on planned	197(44.2)	0	2(14.3)	2(50	7(24.1)	208(39.4)
		Radiation	18(4)	0	0	0	0	18(3.4)
		surgery	26(5.8)	7(20.6)	6(42.9)	0	12(41.4)	51(9.7)
		Surgery and radiotherapy	1(0.2)	0	0	0	1(3.4)	2(0.4)
		surgery then chemotherapy then surgery	0	2(5.9)	0	0	0	2(0.4)
		Surgery then Chemotherapy	7(1.6)	14(41.2)	2(14.3)	0	0	23(4.4)
		Surgery, Chemotherapy & Radiation	4(0.9)	0	0	0	1(3.1)	5(1)
	Total		446(100)	34(100)	14(100)	4(1000	29(100)	527(100)
2014	treatment list	chemotherapy	207(30.4)	3(6.7)	2(8)	0	3(11.5)	215(27.7)
		Chemotherapy and Radiation	53(7.8)	0	1(4)	0	2(7.7)	56(7.2)
		chemotherapy then surgery	3(0.4)	1(2.2)	1(4)	0	0	5(0.6)
		on planned	299(44)	1(2.2)	7(28)	0	12(46.2)	319(41.1)
		Radiation	58(8.5)	0	1(4)	0	1(3.8)	60(7.7)
		surgery	47(6.9)	18(40)	5(20)	1(100	8(30.8)	79(10.2)
		surgery and radiotherapy	6(0.9)	1(2.2)	0	0	0	7(0.9)
		surgery then chemotherapy then surgery	0	1(2.2)	0	0	0	1(0.1)
		Surgery then Chemotherapy	6(0.9)	20(44.4)	3(12)	0	0	29(3.7)
		Surgery, Chemotherapy & Radiation	1(0.1)	0	5(20)	0	0	6(0.8)

	Total		680(100)	45(100)	25(100	1(100	26(100)	777(100)
2015	treatment list	chemotherapy	106(20)	0	4(17.4)	1(33.3	4(13.8)	115(19)
		Chemotherapy and Radiation	29(5.5)	0	1(4.3)	0	2(6.9)	32(5.3)
		chemotherapy then surgery	5(0.9)	1(5)	1(4.3)	0	0	7(1.2)
		on planned	290(54.9)	0	3(13)	1(33.3	9(31)	303(50.2)
		Radiation	47(8.9)	0	0	1(33.3	1(3.4)	48(7.9)
		surgery	43(8.1)	7(35)	9(39.1)	0	12(41.4)	71(11.9)
		surgery and radiotherapy	5(0.9)	0	1(4.3)	0	1(3.4)	7(1.2)
		Surgery then Chemotherapy	4(0.8)	12(60)	4(17.4)	0	0	20(3.3)
	Total		529(100)	20(100)	23(100)	3(100	29(100)	604(100)
Total	treatment list	chemotherapy	468(28.3)	9(9.1)	9(14.5)	3(37.5	12(14.3)	501(26.2)
		Chemotherapy and Radiation	117(7.1)	0	3(4.8)	0	7(8.3)	127(6.6)
		chemotherapy then surgery	11(0.7)	7(7.1)	2(3.2)	0	0	20(1)
		on planned	786(47.5)	1(1)	12(19.4)	3(37.5	28(33.3)	830(43.5)
		Radiation	123(7.4)	0	1(1.6)	1(12.5	2(2.4)	126(6.6)
		surgery	116(7)	32(32.3)	20(32.3)	1(12.5	32(38.1)	201(10.5)
		surgery and radiotherapy	12(0.7)	1(1)	1(1.6)	0	2(2.4)	16(0.8)
		surgery then chemotherapy then surgery	0	3(3.3)	0	0	0	3(0.2)
		Surgery then Chemotherapy	17(1)	46(46.9)	9(14.5)	0	0	72(3.7)
		Surgery, Chemotherapy & Radiation	5(0.3)	0	5(7.1)	0	1(1.2)	11(0.6)
	Total		1655(100)	99(100)	62(100)	8(100)	84(100)	1908(100)

6.12 The relationship between imaging used for gynecological malignancy

In this study, 49%, 47.5%, 43.5%, 62.5%, and 33.3% of the cervical, ovarian, uterine, vaginal, and vulvar cancers had a recorded imaging diagnosis of ultrasound, while 72.9% of the GTN had a recorded ultrasound and chest x-ray imaging.

Table 11. The relation between imaging used for gynecological malignancy

Types of imaging used	Primary site of malignancy						Total
	cervix	ovary	uterus	vagina	vulva	placenta	
MRI and CT scan	3(0.2)	0	0	0	1(1.2)	0	4(0.2)
Chest x ray	6(0.4)	0	0	0	0	0	6(0.3)
CT scan	8(0.5)	0	2(3.2)	0	1(1.2)	0	11(0.6)
CT scan & Chest x ray	4(0.2)	0	0	0	1(1.2)	0	5(0.3))
MRI	35(2.1)	0	2(3.2)	0	2(2.4)	0	39(2)
MRI & Chest x ray	19(1.1)	0	0	0	1(1.2)	0	20(1)
Ultrasound	811(49)	47(47.5)	27(43.5)	5(62.5)	28(33.3)	15(17.6)	933(46.8)
Ultrasound & Chest x ray	175(10.6)	3(3)	3(4.8	0	3(3.6)	62(72.9	246(12.3)
Ultrasound & MRI	165(10)	0	6(9.7)	1(12.)5	24(28.6)	0	196(9.8)
Ultrasound and CT scan	176(10.6)	17(17.2)	6(9.7)	1(12.5	13(15.5)	0	213(10.7)
Ultrasound and CT scan and Chest x ray	118(7.1)	26(26.3)	6(9.7)	1(12.5)	1(1.2)	8(9.4)	160(8)
Ultrasound, MRI & CT scan	18(1.1)	1(1)	3(4.8)	0	0	0	22(1.1)
Ultrasound, MRI and Chest x ray	108(6.5)	3(3)	5(8.1)	0	9(10.7)	0	125(6.3)
Ultrasound, MRI, CT scan & Chest x ray	9(0.5)	2(2)	2(3.2)	0	0	0	13(0.7)
Total	1655(100)	99(100)	62(100)	8(100)	84(100)	85(100)	1993(100)

6.13 Histopathology related characteristics of gynecological malignancy

6.13.1 Histopathology results from the non-surgical cervical diagnostic procedure

There were a total of 1655 cervical cancer patients, among whom histology was obtained from cervical diagnostic procedures like punch biopsy, cone biopsy, and others, surgical biopsy, or both. From all 1655 cervical cancer patients, squamous cell carcinoma constituted 90% of the cervical cancer burden in this study, followed by adenocarcinoma (6.3%), and then adenosquamous carcinoma (1.3%). The findings of this study also show that 96.9% of the cervical cancer patients had a histopathology result from a non-surgical cervical diagnostic procedure. For those who had a histopathologic diagnosis from a non-surgical diagnostic cervical procedure, 87.4% of the participants had squamous cancer, followed by adenocarcinoma (5.7%). Regarding the trends of histopathologic diagnosis from a non-surgical cervical procedure, 26.9% were in 2013, 41% were in 2014, and 32% were in 2015.

Table 12. Histopathology results from the non-surgical cervical diagnostic procedure.

result of previous procedure performed * Primary site of malignancy * Year of diagnosis			
2013	result of non-surgical cervical procedure performed	no	16(3.6)
		Squamous cancer	385(86.3
		Adenocarcinoma	28(6.3)
		Adeno-squamous	7(1.6)
		Poorly differentiated carcinoma	6(1.3)
		CIS	3(0.7)
		CIN3	1(0.2)
	Total		446(100)
2014	result of non-surgical cervical procedure performed	no	23(3.4)
		Squamous cancer	599(88.1)
		Adenocarcinoma	29(4.3)
		Adeno-squamous	9(1.3)
		Poorly differentiated carcinoma	5(0.7)
		CIS	11(1.6)
		CIN3	4(0.6)
	Total		680(100)
2015	result of non-surgical	No	13(2.5)
		Squamous cancer	463(87.5)

	cervical procedure performed	Adenocarcinoma	38(7.2)
		Adeno-squamous	4(0.8)
		Poorly differentiated carcinoma	2(0.4)
		CIS	6(1.1)
		CIN3	3(0.6)
	Total		529(100)
Total	result of non-surgical cervical procedure performed	no	52(3.1)
		Squamous cancer	1447(87.4
		Adenocarcinoma	95(5.7)
		Adeno-squamous	20(1.2)
		Poorly differentiated carcinoma	13(0.8)
		CIS	20(1.2)
		CIN3	8(0.5)
	Total		1655(100)

6.13.2 Cervical cancer histopathology results from surgery

In this study, there were a total of 1655 cervical cancer patients, whose histology was obtained from both surgical biopsy and cervical diagnostic procedures. Of which, squamous cell carcinoma constituted 90% of the cervical cancer burden in this study, followed by adenocarcinoma (6.3%), and then adenosquamous carcinoma (1.3%). 143 (8.6%) of cervical cancer patients had histopathology results after surgery, and of those who had histopathology results after surgery, 25.9% (n = 37) were in 2013, 38.4% (n = 55) were in 2014, and 35.7% (n = 51) were in 2015. For those who have a histologic diagnosis after surgery, 36.4% (n = 52) had a histopathologic result only after surgery with no previous cervical procedure, and 63.6% (n = 91) had a histopathology result from both surgery and a non-surgical diagnostic cervical procedure. The specific types of histopathologic findings are shown in the table below.

Table 13. Cervical cancer histopathology results from surgery.

Histopathology result from surgery * Primary site of malignancy * Year of diagnosis			
Count			
Year of diagnosis			Primary site of malignancy
			cervix
2013	Histopathology result from surgery	No	409(91.7)
		Squamous cell carcinoma	26(5.8)

		Adenocarcinoma	6(1.3)
		Adeno-squamous carcinoma	2(0.4)
		CIN 3	3(0.7)
	Total		446(100)
2014	Histopathology result from surgery	No	625(91.9)
		Squamous cell carcinoma	48(7.1)
		Adenocarcinoma	4(0.6)
		Adeno-squamous carcinoma	2(0.3)
		CIN 3	1(0.1)
	Total		680(100)
2015	Histopathology result from surgery	No	478(90.4)
		Squamous cell carcinoma	42(7.9)
		Adenocarcinoma	7(1.3)
		CIN 3	2(0.4)
	Total		529(100
Total	Histopathology result from surgery	No	1512(91.4)
		Squamous cell carcinoma	116(7)
		Adenocarcinoma	17(1)
		Adeno-squamous carcinoma	4(0.2)
		CIN 3	6(0.4)
	Total		1655(100)

6.14 Trends of gynecologic malignancy

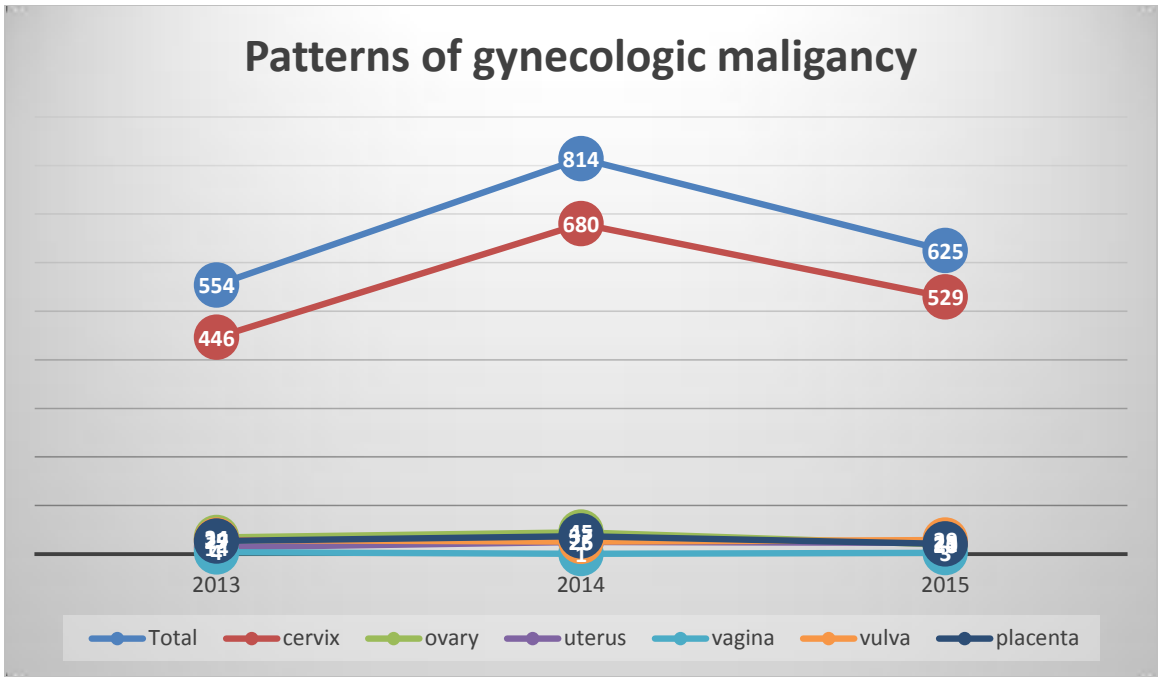

Figure2.The patterns of all malignancy with each year.

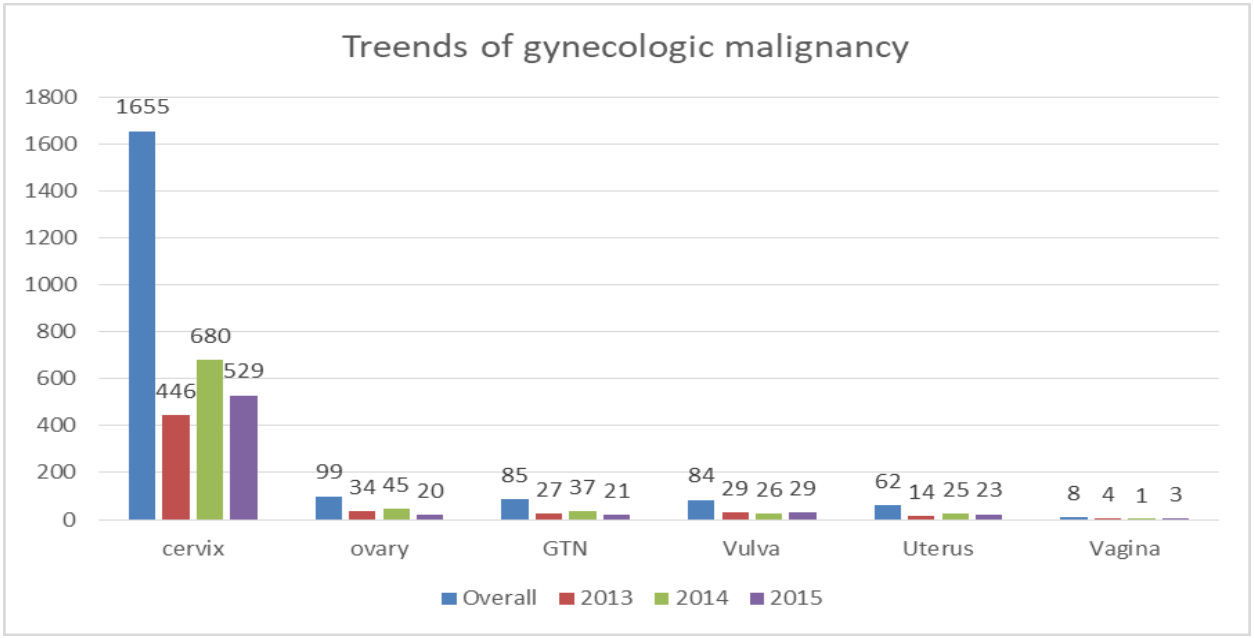

Figure3.trennds of gynecologic malignancy

6.14.1 Trends of cervical cancer

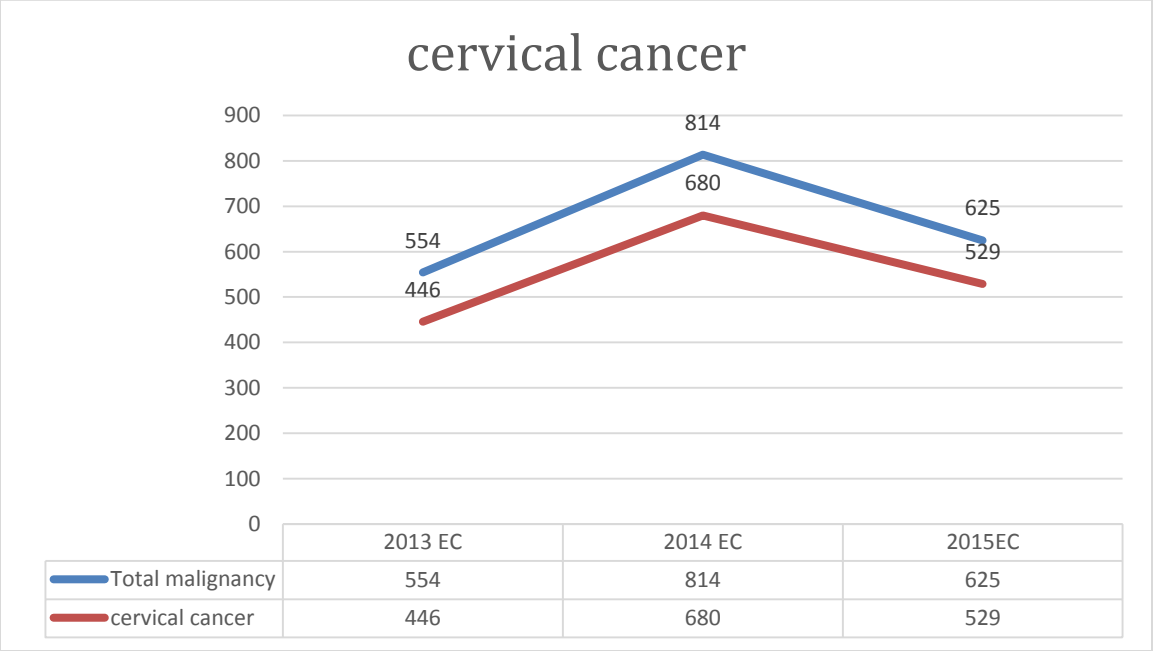

Figure 4 relative frequency of cervical cancer with the total gynecologic malignancy.

6.15 Endometrial cancer histopathology result after surgical biopsy

From the total uterine cancer (62), endometrial cancer accounts for 56 histopathology results, of which 56.6% had endometroid adenocarcinoma, 14.5% of them were serous, and the remaining were carcinosarcoma, clear cell carcinoma, squamous cell carcinoma, and others. Out of all endometrial cancers, 51.6% (n = 32) of the patients had histopathology results after surgery. From which (n = 32), 53.1% (n = 17) of the participants had histopathology only from biopsy after surgery, and the remaining 46.9% (n = 15) had histopathology results from both surgery and endometrial biopsy. Concerning the trends of histopathology results after surgery, 15.6% were in 2013, 46.9% were in 2014, and 37.5% were in 2015.

Table 14. The distribution of endometrial cancer patients who underwent surgery from the total uterine cancer

Histopathology type after surgery * Primary site of malignancy * Year of diagnosis			
Year of diagnosis			Uterus
2013	Endometrial cancer distribution after surgery	no(other uterine cancer and those diagnosed by endometrial biopsy)	9(64.3)
		Endometrioid	4(28.6)
		Serous	1(7.10
	Total		14(100)
2014	Endometrial cancer distribution after surgery	no(other uterine cancer and those diagnosed by endometrial biopsy)	10(40)
		Endometrioid	11(44)
		Serous	3(12)
		Clear cell	1(4)
	Total		25(100)
2015	Endometrial cancer distribution after surgery	No (other uterine cancer and those diagnosed by endometrial biopsy)	11(47.8)
		Endometrioid	9(39.1)
		Serous	2(8.7)
		Carcinosarcoma	1(4.3)
	Total		23(100)
Total	Endometrial cancer distribution after surgery	No (other uterine cancer and those diagnosed by endometrial biopsy)	30(48.3)
		Endometrioid	24(38.7)
		Serous	6(9.7)
		Clear cell	1(1.6)
		Carcinosarcoma	1(1.6)
	Total		62(100)

6.16 Endometrial cancer histopathology result from endometrial biopsy

There were a total of 52 endometrial biopsys performed prior to the surgery. 11 were for cervical cancer patients, and the remaining 41 procedures were for uterine cancer. Among these 41 procedures, 24 endometrial cancers were diagnosed by only endometrial biopsy, and the remaining 18 were both by endometrial biopsy and after surgery. From those having histopathology results from both surgery and endometrial biopsy, 15 cases were endometrial cancer and 3 were uterine mesenchymal cancer. So, of the total 6 uterine cancers, 3 were diagnosed after surgery, and 3 were diagnosed by both surgery and endometrial biopsy. Concerning the trends of endometrial biopsy done for the diagnosis of uterine cancer only (n = 41), 21.9% were done in 2013, 46.3% were done in 2014, and 31.7% were done in 2015, as shown in Table 20 below.

Table 15. The histopathology distribution of uterine cancer among those who had endometrial biopsy

Non-surgical HP * Primary site of malignancy * Year of diagnosis			
Year of diagnosis			Uterine cancer
2013	Histopathology result of endometrial biopsy	No (no endometrial biopsy)	5(35.7)
		Carcinosarcoma	2(14.3)
		Endometrioid	2(14.3)
		Poorly differentiated carcinoma	1(7.1)
		Serous	1(7.1)
		Squamous cell carcinoma	3(21.4)
	Total		14(100)
2014	Histopathology result of endometrial biopsy	No (no endometrial biopsy)	6(24)
		Serous EIC	1(4)
		Adenocarcinoma	2(8)
		Carcinosarcoma	1(4)
		Endometrioid	12(48)
		Mucinous	1(4)
		Serous	1(4)
		Undifferentiated	1(4)

	Total		25(100)
2015	Histopathology result of endometrial biopsy	No (no endometrial biopsy)	10(43.5)
		adenocarcinoma	1(4.3)
		Carcinosarcoma	1(4.3)
		Endometrioid	8(34.8)
		Poorly differentiated carcinoma	1(4.3)
		Serous	2(8.7)
	Total		23(100)
Total	Histopathology result of endometrial biopsy	No (no endometrial biopsy)	21(33.9)
		Serous EIC	1(1.6)
		Adenocarcinoma	3(4.8)
		Carcinosarcoma	4(6.5)
		Endometrioid	22(35.5)
		Mucinous	1(1.6)
		Poorly differentiated carcinoma	2(3.2
		Serous	4(6.5)
		Squamous cell carcinoma	3(4.8)
		Undifferentiated	1(1.6)
	Total		62(100)

6.17 Ovarian Cancer Histopathology-Related Characteristics of the Study Participants

6.17.1 Epithelial cancer histopathology result

From 99 pure ovarian cancers, 76.7% (n = 76) were epithelial cancer, and the most common epithelial cancer (67.1%) was serous cancer, followed by mucinous types of epithelial ovarian cancer. Regarding its trends, 38.2% were in 2013, 42.1% were in 2014, and 19.7% were done in 2013.

Table 16. Epithelial cancer histopathology distribution after surgery with year

Epithelial histopathology * Primary site of malignancy * Year of diagnosis			
Year of diagnosis			Primary site
			ovary
201	Epithelial ovarian	No (other ovarian cancer)	5(14.7)

3	cancer	Endometrioid	1(2.9)
		Adenocarcinoma	2(5.9)
		Carcinosarcoma	2(5.9)
		Mucinous	4(11.8)
		Serous	19(55.9)
		Urothelial carcinoma	1(2.9)
	Total		34(100)
2014	Epithelial ovarian cancer	No (other ovarian cancer)	13(28.9)
		Adenocarcinoma	1(2.2)
		Carcinosarcoma	1(2.2)
		Clear cell carcinoma	1(2.2)
		Infiltrate of carcinoma	1(2.20
		Mucinous	7(15.6)
		Serous	21(46.70
	Total		45(100)
2015	Epithelial ovarian cancer	No (other ovarian cancer)	5(25)
		Endometrioid	1(5)
		Adenocarcinoma	1(5)
		Carcinosarcoma	1(5)
		Differentiated carcinoma	1(5)
		Serous	11(55)
	Total		20(100)
Total	Epithelial ovarian cancer	No (other ovarian cancer)	23(23.2)
		Endometrioid	2(2)
		Adenocarcinoma	4(4)
		Carcinosarcoma	4(4)
		Clear cell carcinoma	1(1)
		Differentiated carcinoma	1(1)
		Infiltrate of carcinoma	1(1)
		Mucinous	11(11.1)
		Serous	51(51.5)
		Urothelial carcinoma	1(1)
	Total		99(100

6.17.2 Germ cell histopathology results of ovarian cancer

From the total pure ovarian cancer, germ cell tumors account for 6.1% (n = 6), and regarding the distribution of types of malignancy, dysgerminoma, immature teratoma, and yolk sac tumors each account for 33.3% (n = 2), as shown in the table below.

Table 17. The distribution of germ cell tumors.

Germ cell tumors to pathology * Primary site of malignancy * Year of diagnosis			
Year of diagnosis			Primary site of malignancy
			ovary
2013	Germ cell tumors	No (other ovarian cancer)	33(97.1)
		Dysgerminoma	1(2.9)
	Total		34(100)
2014	Germ cell tumors	No (other ovarian cancer)	42(93.3)
		Dysgerminoma	1(2.2)
		Yolk sac tumor	2(4.4)
	Total		45(100)
2015	Germ cell tumors	No (other ovarian cancer)	18(90)
		Immature teratoma	2(10)
	Total		20(100)
Total	Germ cell tumors	No (other ovarian cancer)	93(94)
		Dysgerminoma	2(2)
		Immature teratoma	2(2)
		Yolk sac tumor	2(2)
	Total		99(100)

6.17.3 Sex cord histopathology results of ovarian cancer

The findings of this study show that, of total ovarian cancer, sex cord accounts for 17.2% (n = 17). From the sex cord tumor, Granulosa cell tumor accounts for 35.3% (n = 6), followed by fibroma (29.4%), as shown in the table below.

Table 18. Sex cord histopathology result of ovarian cancer.

Sex cord stromal tumors * Primary site of malignancy * Year of diagnosis
Count

Year of diagnosis			Primary site of malignancy
			ovary
2013	Sex cord stromal tumors	(other ovarian cancer)	30(88.2)
		fibroma	2(5.9)
		Granulosa cell tumor	1(2.9)
		Sertoli cell tumor	1(2.9)
	Total		34(100)
2014	Sex cord stromal tumors	(other ovarian cancer)	35(77.8)
		fibroma	1(2.2)
		Fibro thecoma	1(2.2)
		Granulosa cell tumor	4(8.9)
		pure sex cord tumor	2(4.4)
		Sclerosing stromal tumor	1(2.2)
		Sertoli leyding cell tumor	1(2.2)
	Total		45(100)
2015	Sex cord stromal tumors	(other ovarian cancer)	17(85)
		fibroma	2(10)
		Granulosa cell tumor	1(5)
	Total		20(100)
Total	Sex cord stromal tumors	(other ovarian cancer)	82(82.8)
		fibroma	5(5.1)
		Fibro thecoma	1(1)
		Granulosa cell tumor	6(6.1)
		pure sex cord tumor	2(2)
		Sclerosing stromal tumor	1(1)
		Sertoli cell tumor	1(1)
		Sertoli leyding cell tumor	1(1)
	Total		99(100)

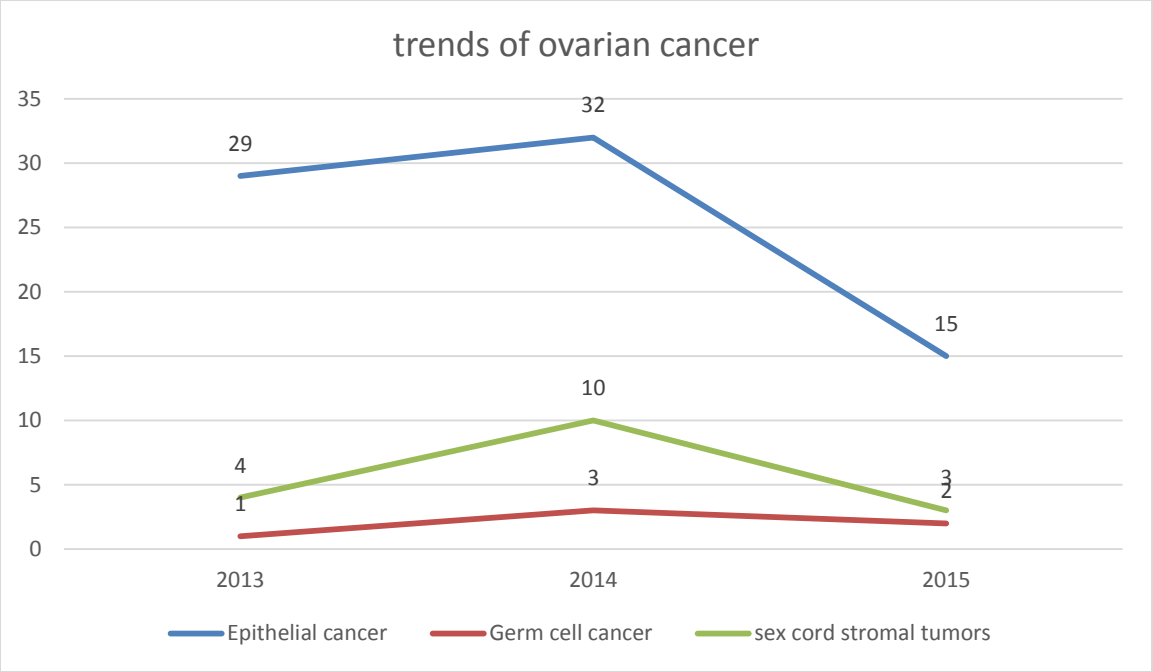

Figure 5 .relative frequency of each histology result of ovarian cancer .

6.18 Vulvar cancer-related characteristics of the study participants

In this study, 84 participants had vulvar cancer, which accounts for 4.2% of the gynecologic malignancy. Concerning its trend of diagnosis, 34.5% were diagnosed in 2013, 30.9% were diagnosed in 2014, and 34.5% were diagnosed in 2015. The commonest type of vulvar cancer was squamous cell carcinoma, which accounts for 96.4%.

Table 19. Vulvar cancer related characteristics of the study participants

vulvar cancer Histopathology type * Primary site of malignancy * Year of diagnosis			
Year of diagnosis			Primary site of malignancy
			vulva
2013	vulvar cancer Histopathology type	Non-Squamous cell carcinoma	1(3.4)

		Squamous cell carcinoma	28(96.6)
	Total		29(100)
2014	vulvar cancer Histopathology type	Non-Squamous cell carcinoma	1(3.8)
		Squamous cell carcinoma	25(96.2)
	Total		26(100)
2015	vulvar cancer Histopathology type	Non-Squamous cell carcinoma	1(3.4)
		Squamous cell carcinoma	28(96.6)
	Total		29(100)
Total	vulvar cancer Histopathology type	Non-Squamous cell carcinoma	3(3.6)
		Squamous cell carcinoma	81(96.4)
	Total		84(100)

6.19 Vaginal cancer related characteristics of the study participants

There were 8 cases of vaginal cancer, with equal 50% of squamous cell carcinoma and non-squamous cell carcinoma.

Table 20. Vaginal cancer related characteristics of the study participants

vaginal cancer Histopathology type * Primary site of malignancy * Year of diagnosis			
Year of diagnosis			vagina
2013	vaginal cancer Histopathology type	Non-Squamous cell carcinoma	2 (50)
		Squamous cell carcinoma	2(50)
	Total		4(100)
2014	vaginal cancer Histopathology type	Non-Squamous cell carcinoma	1(100)
	Total		1(100)
2015	vaginal cancer Histopathology type	Non-Squamous cell carcinoma	1(33.3)
		Squamous cell carcinoma	2(66.7)
	Total		3(100)
Tota	vaginal cancer	Non-Squamous cell carcinoma	4(50)

l	Histopathology type	Squamous cell carcinoma	4(50)
	Total		8(100)

6.20 GTN-related characteristics of the study participants

GTN was the third most common gynecologic malignancy for this study, accounting for 4.3% of cases, following cervical and ovarian cancer, respectively. The majority of the GTN were choriocarcinomas, followed by complete moles and partial moles. Concerning the trend of diagnosis in the study setting, 31.8% were diagnosed in 2013, 43.5% were diagnosed in 2014, and 24.7% were diagnosed in 2015 EC.

Table 21. GTN-related characteristics of the study participants

GTN Histopathology type * Primary site of malignancy * Year of diagnosis.			
Year of diagnosis			Primary site of malignancy
			placenta
	2013	Choriocarcinoma	6(22.2)
		complete mole	2(7.4)
		Invasive mole	4(14.8)
		partial mole	4(14.8)
		Unknown	11(40.7)
	Total		27(100)
	2014	Choriocarcinoma	6(16.2)
		complete mole	7(18.9)
		Invasive mole	3(8.1)
		partial mole	6(16.2)
		Placental site trophoblastic tumor	1(2.7)
		Unknown	14(37.8)
	Total		37(100)
	2015	Choriocarcinoma	2(9.5)
		complete mole	4(19)
		Invasive mole	3(14.3)
		Unknown	12(57.1)
	Total		21(100)
		Choriocarcinoma	14(16.5)
		complete mole	13(15.3)

		Invasive mole	10(11.8)
		partial mole	10(11.8)
		Placental site trophoblastic tumor	1(1.2)
		Unknown	37(43.5)
	Total		85(100)_

6.21 Trends in the Common Histopathology of GTN

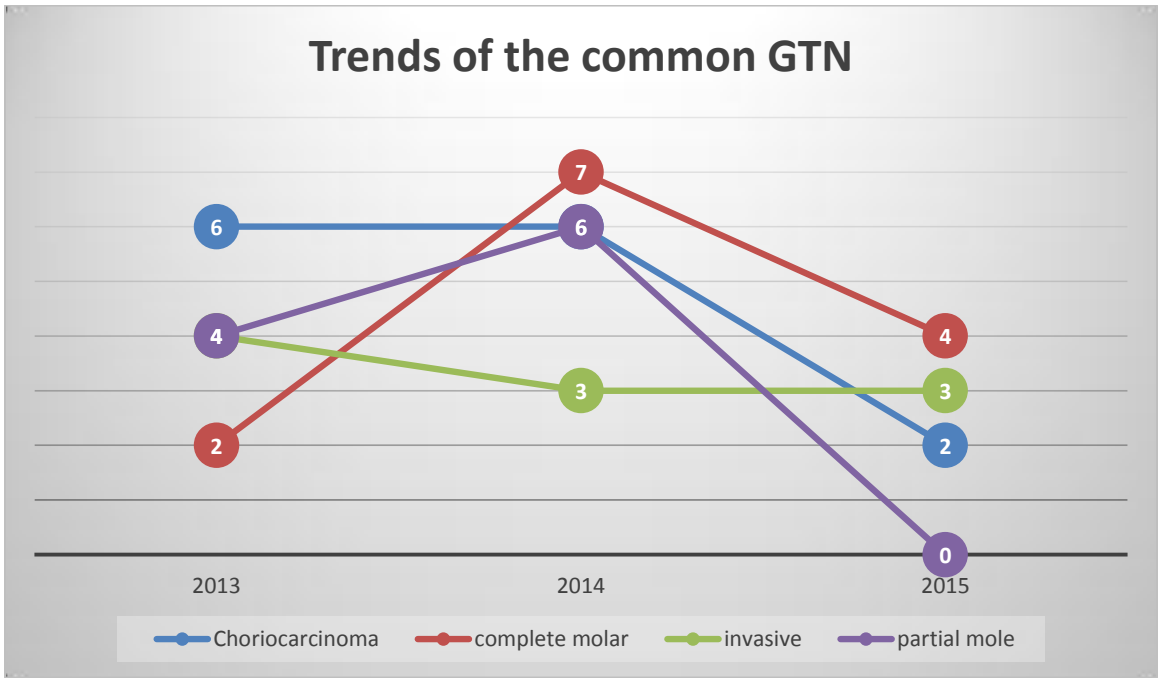

Figure 6.relative frequency of each histology result of gestational trophoblastic neoplasm .

7 Discussions

The pattern of gynecological malignancies is different in various geographical areas. The findings of this three-year chart review study on gynecologic cancer showed that 1993 major gynecologic cancers were reviewed. The findings of the study also revealed that the most common gynecologic cancer was cervical cancer (1655, 83%), followed by ovarian cancer (99, 5%), GTN (85, 4.3%), vulvar cancer (84, 4.2%), and uterine cancer (84, 4.2%). This finding was in line with the study done at the University of Abuja Teaching Hospital (UATH), the department of pathology at BP Koirala Memorial Cancer Hospital (4, 21). The finding of this study is also unlikely with the study done in a tertiary care hospital in Karachi and Al-Madinah

Al-Munawarah region, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, and Pakistan (3, 7, 11, 16), in which the major gynecologic cancers in the literature were ovarian, followed by cervical cancer. This difference may be due to the geographical variability of the study area that affects the gynecological malignancies, which vary across different regions due to factors like environmental influences, lifestyle, availability of screening, genetics, and awareness. For instance, cervical cancer is more prevalent in regions with lower access to screening programs, while ovarian cancer may have a higher incidence in areas with certain genetic predispositions. Differences in age distribution, race, ethnicity, socioeconomic status, and reproductive history among the study populations can lead to variations in malignancy patterns.

Table 10. The clinical characteristics of all gynecological malignancy in relation to age

Variable	Types of gynecologic malignancy						
	Cervix (%)	Ovary (%)	Uterus (%)	Vaginal (%)	Vulvar (%)	Placenta (%)	Total
Age in years							
18-30	35(2.1))	16(16.2)	1(1.6	0(	5(5.9)	40(47.1)	97(4.9)
31-40	244(14.7)	24(24.2)	8(12.9	1(12.5)	26(30.9)	34(40)	337(16.9)
41-50	455(27.5)	27(27.3)	11(17.7	3(37.5)	21(25)	10(11.8)	527(26.4)
51-60	508(30.7)	21(21.2)	12(19.4	0(	12(14.3)	1(1.2)	554(27.8)
61-70	318(19.2)	9(9.2)	28(45.2	3(37.5)	13(14.5)	0	371((18.6)
>70	95(5.7)	2(2.)	2(3.2	1(12.5)	7(8.3)	0	107(5.4)
Mean age	52.63	45.11	56.26	55.50	48.44	32.55	51.35

The mean age of the study participants with gynecologic cancer was 51.2 years. This finding was comparable with the study findings done in Tribhuvan University Teaching Hospital (49.06), Maharajgunj, Kathmandu, and Al-Madinah Al-Munawarah region (54.4) (3, 11).

The commonest age group affected in this study is between the ages of 50 and 59, and this study is similar to the report from the study done at the Obstetrics and Gynecology department of the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria (4). This may be due to the fact

that the risk of developing cancer generally increases with age due to the cumulative effect of exposure to various risk factors over time, such as environmental toxins, radiation, and chronic inflammation. As individuals age, the likelihood of accumulating genetic mutations that can lead to cancer increases. Squamous cell cancer is the most common cervical cancer, serous adenocarcinoma is the most common ovarian cancer, and endometroid adenocarcinoma is the most common endometrial carcinoma in the present study, which is the same as the study done at the Department of Obstetrics and Gynecology, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu, Obstetrics, and Nigerian Tertiary Hospital (3, 4) and also most other studies. Most women who have this gynecologic malignancy are those who have given birth more than five times, and this study has similar results to the study that was done at the Obstetrics and Gynecology Department of the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria (10). Women who have fewer pregnancies or who have their first child later in life have higher lifetime exposure to estrogen, which can increase the risk of certain gynecological cancers. The majority of the gynecologic patients in these studies are in stage 3 (34.3%) at the time of diagnosis, which is similar to the study done at the Department of Obstetrics and Gynecology, University of Abuja Teaching Hospital, Abuja, Nigeria (43%; 10).

In this study, most of the cancer prevalence, regardless of the pathological diagnosis, either increased or remained unchanged over time, as shown in the figure below.

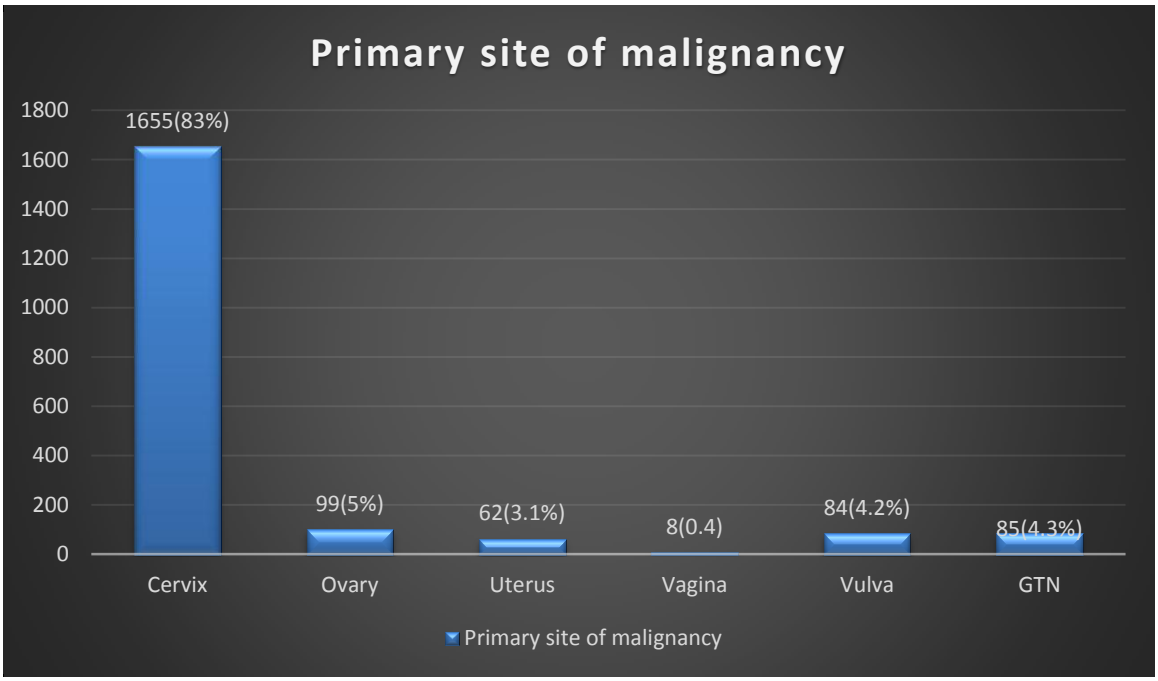

Figure1.The primary site of the malignancy.

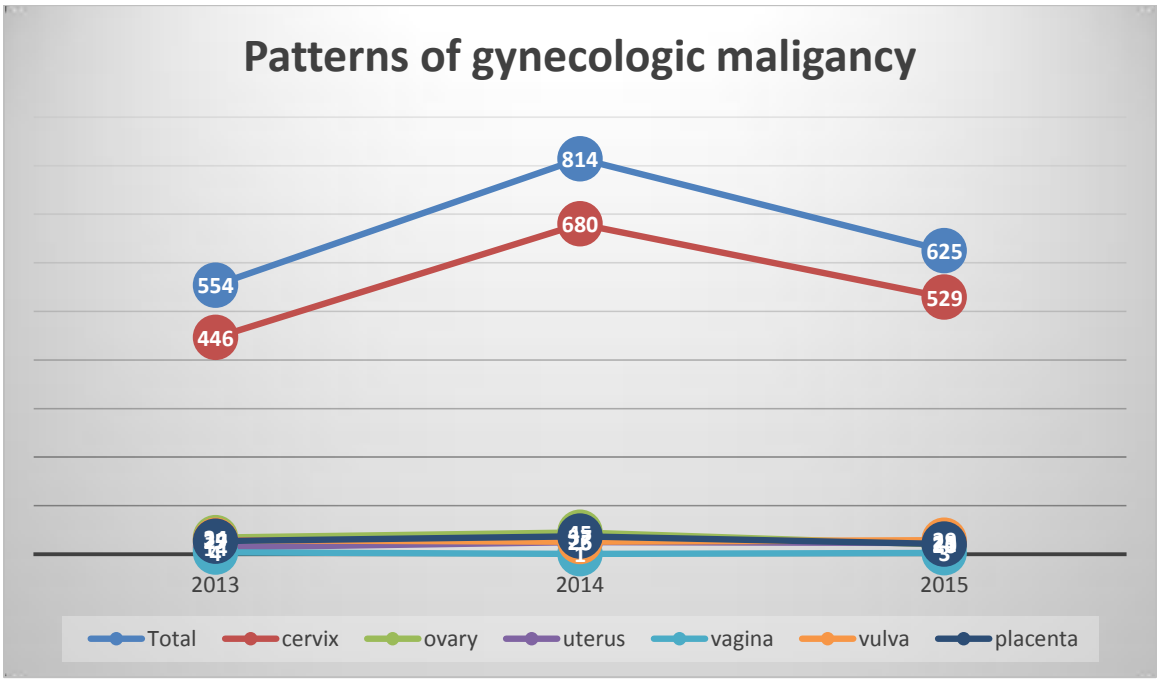

Figure 4 relative frequency of cervical cancer with the total gynecologic malignancy.

In this study, cervical cancer was the most prevalent gynecological cancer, accounting for 83%. This finding was supported by the study done in the Jaipur region of Rajasthan (51.4), the Gynecology Department of Aminu Kano Teaching Hospital (AKTH), Kano, Nigeria (48.6%),

the Obstetrics and Gynecology Department of the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria (65.5%), the Oncology Unit of Saint Paul's Hospital Millennium Medical College (46.7%), and the review at Hawassa University Comprehensive and Specialized Hospital (HUCSH) (73.5%) (17, 4, 18, 19, 9). The proportion of cervical cancer (83%) in this study is, however, high when compared with the above-mentioned outcomes (51.4%, 51.8%, 65.5%, 46.5%, and 73.5%). This may be attributed to the fact that the availability and frequency of screening programs (e.g., Pap smears for cervical cancer) and the methods used for diagnosis can significantly affect reported patterns. For instance, the overall screening was below 3.3% until 2017 in Ethiopia. Another reason could be differences in access to healthcare services, including early detection and treatment, and being a referral center can influence the patterns of gynecological malignancy. Variations in study design, sample size, data collection methods, and statistical analysis can lead to differences in reported patterns.

Squamous cell carcinoma constituted 90% of the cervical cancer burden in this study, followed by adenosquamous carcinoma (6.3%), and then adenocarcinoma (1.3%). This is similar to the reports from the study that was done at the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria, in the department of obstetrics and gynecology at Tribhuvan University Teaching Hospital (78.3%), at the oncology unit of Saint Paul's Hospital Millennium Medical College, and at Hawassa University Comprehensive and Specialized Hospital (HUCSH) (65.2%). (4,3,19,9).

In this study (85.8%), cervical cancer patients presented to the hospital within 12 months of the onset of symptoms, and when compared to the study done at Hawassa University Comprehensive and Specialized Hospital (HUCSH) (31.4), the urgency of seeking medical treatment was higher in patients involved in this study (9).

The early stage is defined as stages I–IIA (as it is operable). 270 (16.2%) are early stages, and these results are relatively better compared to the study that was done at Hawassa University Comprehensive and Specialized Hospital (HUCSH) (7.8) 9.In comparison to other settings, the findings of the study also revealed that 6.5% of the cervical cancer patients were presented as stage 1, which is very low compared to 25.56% of the cervical cancer patients who presented as stage 1 by the time of diagnosis in the study that was done at the Department of Obstetrics and

Gynecology, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu (3). This difference may be due to the fact that in many regions, especially in low- and middle-income countries, there is limited access to routine gynecological care and cancer screening. Women in these areas are less likely to be screened regularly, leading to delayed diagnosis. Women with lower socioeconomic status may have limited access to healthcare, including preventive services. Financial constraints, a lack of insurance, and the cost of healthcare can all contribute to delays in diagnosis. Women living in rural or remote areas may have limited access to specialized healthcare services, leading to longer wait times for appointments, diagnostic tests, and referrals to specialists. This geographical isolation can delay diagnosis and treatment. The commonest affected age group was between 41 and 50, with a mean age of 52.63, and this finding is similar to the 57.5 ± 12.6 years documented by the study that was done at the Department of Obstetrics and Gynecology, University of Abuja Teaching Hospital, Abuja, Nigeria (55.5%). [10] It is, however, higher than the mean age of 46.25 ± 4.99 years reported by Yakasai et al. [18]

The findings of the study also showed that ovarian cancer was the second-most prevalent gynecologic malignancy, accounting for 5% of all gynecologic malignancies. This finding is similar to the study that was done in the Jaipur region of Rajasthan (24.6%), at four major pathology departments in the Jaipur region of Rajasthan (22.1%), the Department of Obstetrics and Gynecology, Aminu Kano Teaching Hospital, Kano (30.5%), and a review at Hawassa University Comprehensive and Specialized Hospital (HUCSH) (10.5%) (17, 4, 18, 9). The proportion of ovarian cancer (5%) in this study is, however, very low when compared to the above-mentioned study and at variance with a study done in a tertiary care hospital in Karachi (54.7%), Al-Madinah Al-Munawarah region (13.5%), Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu (50.6%), and Pakistan (47.1%) (3, 7, 11, 16). These may be due to the fact that certain populations may have a higher prevalence of genetic mutations, which significantly increase the risk of ovarian cancer. Hormonal factors, such as the number of ovulatory cycles a woman experiences, can affect the risk of ovarian cancer, and there is no standard screening technique for early diagnosis of ovarian cancer. As it is difficult to detect early in its evolution. The commonest affected age group was between 41 and 50, with a mean age of 45.11, and this study goes in line with the study done in a Nigerian tertiary hospital

(40.9%), but is higher than the study done in the Al-Madinah Al-Munawarah region of Saudi Arabia (34.9%) (11).

The most common ovarian cancer in this study is the epithelial type, of which serous cystadenocarcinoma is the most common variety. This is similar to the reports from the study that was done at the University of Abuja Teaching Hospital (UATH), Abuja, Nigeria, and the Department of Pathology, College of Medicine, Taibah University, Al-Madinah Al-Munawarah, Kingdom of Saudi Arabia. (4,11)

In our study, we noticed a low incidence of uterine corpus cancer. It accounts for 3.2% of all gynecologic malignancies, making it the 5th most common gynecologic cancer, and this finding goes in comparison to the study that was done at the department of pathology at BP Koirala Memorial Cancer Hospital (2.4%), making it the 5th most common gynecologic cancer in their set-up (21). These findings are in contrast to most of the literature, where the uterine corpus is one of the three most common gynecologic cancers, especially in western countries. The low prevalence of obesity, hypertension, diabetes and breast cancer in our country as compared to the west may be the cause of the low incidence of endometrial cancer. However, epidemiological research is required to examine this theory. Endometroid adenocarcinoma variety was the most common endometrial cancer in our study, which is correlating with findings in another study. The commonest age for endometrial cancer is between 60 and 70, with a mean age of 56.26. The most common presenting complaint is irregular vaginal bleeding, and this study goes in line with the studies done in Nigerian tertiary hospitals (54.5%) and in the Al-Madinah Al-Munawarah region of Saudi Arabia (58.48%) (4, 11).

Gestational trophoblastic neoplasm stands third on the list of gynecological malignancies. In this study, it is responsible for 4.3% of all gynecologic malignancies. The result of this study goes in line with the findings from the study in the south Punjab region of Pakistan, where it is the 3rd most common gynecologic malignancy and its prevalence was 12.9% (7). Contrary to the research that was done at Al-Madinah Al-Munawarah (1.5%), the department of Obstetrics and Gynecology, Tribhuvan University Teaching Hospital, Maharajgunj, Kathmandu (3.82%), the incidence in our study (4.3%) is high as compared to other international studies. This can be the result of the fact that in our country, people have low socio-economic status, and this disease is

linked to poverty. Moreover, as our center is the only hospital that has a well-organized unit of both gynecology oncology and oncology departments, it is the only hospital in the whole country to accept referrals for such cases, contributing to the relatively higher prevalence of gestational trophoblastic neoplasm. The majority of the patients with gestational trophoblastic neoplasia in this study are between the ages of 18 and 30, with the mean age being 32.55.

In this study, 82.2% of the GTN patients had stage 1 diseases at presentation, and this correlates with the study done by the Department of Obstetrics and Gynecology at Tribhuvan University Teaching Hospital (66%) (3). The mean age for choriocarcinoma patients in this study was 32.55 years. This finding is similar to the study done in a Nigerian tertiary hospital (30.5) (4).

The incidence of vulvar carcinoma in this study was 4.2%, which makes it the 4th most common gynecologic malignancy. The findings of this study go in line with the study done at the Federal Teaching Hospital, Abakaliki, Nigeria (7.1%), a tertiary care hospital in Karachi (4.7%), which was the 4th most common malignancy. Even though vulvar cancer accounts for 6 percent of all gynecologic malignancies worldwide and the incidence in our study is lower (4.2%), the findings in our study are higher compared to the studies that were done in departments in the Jaipur region of Rajasthan (1.9%), the Obstetrics and Gynecology department of the University of Abuja Teaching Hospital (UATH) (0.9%), and the south Punjab Region of Pakistan (1.6%) (17, 4, 7). These may be again due to the fact that the primary surgical treatment is usually offered by the gynecology oncologist in collaboration with an oncologist, unlike other gynecologic malignancies like ovarian, endometrial, and cervical, which could be referred to as postoperative, and our hospital is the only hospital in a whole country with such units. In this study, the most common age involved in vulvar cancer is between 30 and 40. Most of the patients are known HIV patients (94%). The findings of the study also revealed that the mean age of vulvar cancer was 48.44 years. This finding was higher than the study done in a Nigerian tertiary hospital (34.5) (4), but lower than the study done in the al-Madinah Al-Munawarah region of Saudi Arabia (59.4) (11).

In the present study, vaginal cancer accounts for 0.4% of all gynecologic malignancies, making it the least common gynecologic malignancy, which goes in line with the report of other studies.

8 Conclusions

Based on our research, we can say that, in TASH Addis Ababa, Ethiopia, cervical cancer is the most prevalent malignancy in the female genital tract, followed by ovarian cancer. The prevalence of cervical cancer is unusually high when compared to regional and global prevalence levels. Paradoxically, the one with a higher frequency than other gynecologic cancers is also the one that is preventable. Given that cervical cancers are preventable, it is imperative to acknowledge the significance of health education in the routine screening and treatment of premalignant lesions.

9 Recommendations

It is imperative to prioritize education and public awareness campaigns in order to regularly test for and treat premalignant lesions in the female genital tract. Advancement in building screening facilities, doing routine gynecological exams, and having a clear follow-up monitoring system can reverse the impact of female genital cancer.

Usage of advanced and self-administered screening methods for high-risk populations and the general public will enable early detection and significantly lower the morbidity and death rate from gynecological malignancies, especially cervical cancer.

10. ETHICAL CONSIDERATIONS

After presenting the proposal to the department of gynecology and obstetrics, a letter of approval will be obtained from the research and ethics committee from the department of obstetrics and gynecology, from which a letter of cooperation will be taken to the respective units, i.e., the OR, the Pathology Department Head, the head nurse of the gynecologic ward, and the card room head. Since this is a retrospective study, all of the data will be filled out from the chart inside the card room and returned right away. All the information that was taken from the chart will be confidential, and it will not be given to any third person.

11. Dissemination plan and use of findings

The result of the study will be presented to TASH, Department of Obstetrics and Gynecology. The final report will be submitted to TASH, Addis Ababa City Health Bureau, and other

responsible stakeholders. Moreover, efforts will be made to publish the findings of the study and disseminate them through different journals and scientific publications.

ANNEX I: QUESTIONNAIRE/DATA COLLECTION TOOLS

Questionnaire designed to assess patterns and relative frequency of all gynecologic malignancy at Tikur Anbessa specialized hospital (TASH), Addis Ababa, Ethiopia

Part I:Socio-demographic characteristics of respondents

101	Age	_____years
102	Age at marriage	_____years
103	Age of menarche	_____years
104	Age of menopause	_____years
105	parity	
106	Number of previous abortion/Ectopic or Molar pregnancy	_____Abortion _____Ectopic pregnancy _____Molar pregnancy
107	Ethnicity	1. Amhara 2. Oromo 3. Tigre 4. Gurage 5. others, specify____
108	Medical illness	1. Known HTN 2. Known DM 3. Known RVI 4. others, specify____
109	Past history	1. previous history of breast/colon/endometrial cancer (specify

		each present) 2. family history of above cancers breast/colon/endometrial cancer (specify each)
110	first degree relative history of	3. previous history of breast/colon/endometrial cancer (specify each present) 4. family history of above cancers breast/colon/endometrial cancer (specify each)
111	History of breast feeding	1 yes 2 no
112	Hx of smoking	1 yes 2 no

Part II : Presenting main complaint (comes before pathology and treatment

201	If cervical/ Ovary/Uterus/Vagina/ Vulva cancer	1. Abdominal pain 2. swelling 3. Irregular vaginal bleeding 4. Urinary symptoms 5. Abnormal vaginal discharge 6. Vulvar itching 7. Post-menopausal bleeding 8. Gastro intestinal upsets 9. Post coital bleeding 10. Post-surgery 11. Post evacuation 12. others, specify____

Part III Duration of presenting symptom

301	**Duration of presenting symptom in months**	----- months

Part IV : Diagnosis year

401	Year of diagnosis	.------- E.C

Part V *Primary site of malignancy*

500	***Primary site of malignancy***	1. Cervix 2. Ovary 3. Uterus 4. Vagina 5. Vulva 6. Undetermined

501 **If cervix cancer**

501.1	Histopathology result	1. Squamous cell carcinoma 2. Adenocarcinoma 3. Mixed cervical carcinoma 4. Neuroendocrine cervical tumor 5. Other, specify_____
501.2	Specimens tissue dimension	**Number of tissue pieces---** **Tissue piece dimensions**** **Mm x mm x mm**
501.3	Diameter of ectocervix	---- Mm X --- -mm ---- Mm X --- -mm

	Depth of specimen	
501.4	Lymphadenectomy specimen	1. Sentinel node 2. Regional nodes (pelvic or Para aortic) 3. Non-regional nodes(inguinal) 4. Other node group, *specify*
501.5	Previous procedure performed	1. Leep 2. Cone 3. Punch biopsy 4. ECC 5. Other, specify
	Result	1 CIN 1 2 CIN 2 3 CIN3 4 CIS 5 Squamous cancer 6 AIS 7 Adenocarcinoma 8 Adenosquamous
501.6	MACROSCOPIC APPEARANCE OF TUMOUR(S)	1. No macroscopically visible tumor 2. Exophytic/polypoid 3. Flat 4. Ulcerated 5. Circumferential/barrel shaped cervix 6. Other, *specify*

502 If endometrial cancer

502.1	**Histopathology type after surgery**	1. Endometrioid 2. Mucinous 3. Serous 4. Clear cell 5. Undifferentiated 6. Neuroendocrine 7. Mixed 8. Carcinosarcoma 9. Other
502.2	***Histologic grading***	1. Grade 1 2. Grade 2 3. Grade 3
502.3	If endometrial biopsy was used for diagnosis before hysterectomy	1. Pipelle 2. Currettings 3. Other/not stated
	Type of sample	
	Histopathology type	1. Endometrioid 2. Mucinous 3. Serous EIC

4. Serous
5. Clear cell
6. Undifferentiated
7. Neuroendocrine
8. Mixed
9. Carcinosarcoma
10. Other

Histologic grading

1. Grade 1
2. Grade 2
3. Grade 3

503 other uterine cancer(Includes carcinomas, carcinosarcomas (malignant mixed Müllerian tumor) and neuroendocrine carcinomas arising in the endometrium)

503.1 Histologic Type

1. Leiomyosarcoma
2. Endometrial stromal tumors
3. Mixed mesenchymal tumors

503.2 Histologic Grade

1. Grade 1
2. Grade 2
3. Grade 3
4.

504 If ovarian cancer

504.1 Histopathology type

1 Epithelial

1.1 Serous
1.2 Mucinous
1.4 Brenner
1.4 Endometrioid
1.5 others, specify____

2 Germ cell tumors

1.1 Dysgerminoma
1.2 Immature teratoma
1.3 Yolk sac tumor
1.4 Embryonal carcinoma
1.5 Choriocarcinoma
1.6 other

	3 Sexcord stromal tumors	3.1 Fibroma
		3.2 Thecoma
		3.3 Sertoli cell tumor
		3.4 mixed tumor
		3.5 others:-------

505 If vulvar cancer

505.1	Histopathology type	1 Squamous cell carcinoma 2 Non Squamous cell carcinoma

506 If vaginal cancer

506.1	Histopathology type	1 Squamous cell carcinoma 2 Non Squamous cell carcinoma
	Site	1 primary 2 Secondary

507 If GTN

507.1	Initial serum B-HCG	
507.2	Histopathology type	1. Invasive mole 2. Choriocarcinoma 3. Placental site trophoblastic tumor 4. Epitheloid trophoblastic tumor 5. Partial mole 6. Complete mole 7. unknown
507.3	Treatment for GTN	1 chemotherapy 2 suction and curettage 3 hysterectomy 4 no treatment
507.4	WHO risk assessment	1 low risk 2 high risk 3 ultra high risk

Part VI: Staging

601 CLINICAL STAGING/surgical staging

601.1	If cervical cancer		*Stage*.----------	Staging after neoadjuvant
601.2	If ovarian cancer		Stage.----------	
601.3	If endometrial cancer		Stage.----------	
601.4	If vulvar cancer		Stage.----------	
601.5	If GTN	Initial Serum B HCH----	Stage.----------	

602 Radiological staging

602.1	If cervical cancer	Stage.----------
602.2	If ovarian cancer	Stage.----------
602.3	If endometrial cancer	Stage.----------
602.4	If vulvar cancer	Stage.----------
602.5	If vaginal cancer	Stage.----------
602.6	If GTN	Stage.----------

Part VII Imaging

701	Types of imaging used	1. Ultrasound 2. MRI 3. CT scan 4. Chest x ray

Part VIII Treatment

800	Types of treatment given	1. Surgery 2. Chemotherapy 3. Radiation 4. Surgery then chemotherapy 5. Chemotherapy then surgery 6. No treatment 7. Others

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