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Original Research Article

Spectrum of Gynaecological Malignancies: A Single Centre Cross Sectional Study

Maity P.[1], Das D.[2], Ray S.[3], Babu A.S.[4]

[1]Assistant Professor, College of Medicine & JNM Hospital, Kalyani, West Bengal, India
[2]Associate Professor, College of Medicine & JNM Hospital, Kalyani, West Bengal, India
[3]Senior Resident, College of Medicine & JNM Hospital, Kalyani, West Bengal, India
[4]Professor, College of Medicine & JNM Hospital, Kalyani, West Bengal, India

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Corresponding Author: Dr. Priyanka Maity
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Abstract:

Introduction: Gynaecological malignancies are tumours of female genital tract, including neoplasms of ovary, fallopian tube, uterus, cervix, vagina and vulva which contribute considerably to female morbidity and mortality. In this study, our objectives were to analyse the histopathological types of gynaecological malignancies and determine the frequency of distribution of these malignant neoplasms among patients who were managed surgically at our institute. We also evaluated the association between the type of gynaecological cancer and FIGO stage at presentation.

Materials and Methods: This was a cross-sectional, observational study that included 465 cases of malignant neoplasms of female genital tract reported over ten years. The site, histologic type and histologic grade of tumours were noted. The pathologic stage in case of radical hysterectomies was recorded. Chi-square test was used to analyse the frequency distribution of categorical data.

Results: Most of the cases were of cervical carcinoma (n: 335, 72.1 %) followed by ovarian carcinoma (n: 73, 15.6%) and endometrial carcinoma (n: 57, 12.3 %). The difference in frequency distribution of these malignancies was statistically significant with cervical carcinoma occurring far more frequently than the other two types. There was significant association between type of gynaecological cancer and FIGO stage at presentation.

Conclusion: Our study reveals cervical carcinomas are the most common gynaecological malignant tumours followed by ovarian and endometrial cancers. This indicates the need for a more widespread screening system for cervical carcinoma. Most of the cases of cervical, ovarian and endometrial cancer present at early stage. Ovarian cancers have higher proportion of advanced stage cases as compared to cervical and endometrial cancers.

Keywords: Cervical Carcinoma, Ovarian Cancer, Endometrial Cancer, FIGO stage.

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Introduction

Gynaecological malignancies represent a significant health problem. They contribute considerably to female morbidity and mortality. These diseases form approximately 40 % of total cancer cases and contribute to about 30 % of total cancer related deaths in women worldwide [1]. Gynaecological malignancies are the tumours of female genital tract, including neoplasms of ovary, fallopian tube, uterus, cervix, vagina and vulva.

Cervical carcinoma is fourth most commonly diagnosed cancer and fourth leading cause of cancer related death in women worldwide [2]. India contributes significantly to the global burden of cervical carcinoma. In India it is the second most common cause of cancer and the second leading cause of cancer mortality in women [3]. Ovarian tumours are predominantly benign (about 80%) while 20% are malignant. Ovarian carcinoma has been ranked as the eighth most common cancer diagnosed and cause of cancer death in women, worldwide [4]. Endometrial carcinoma was previously considered a disease of the developed world. However, an increase in risk factors has led to a rising trend in the incidence of endometrial carcinoma in developing countries. The 2023 International Federation of Gynaecology and Obstetrics (FIGO) staging for endometrial carcinoma introduced major changes from the 2009 criteria, resulting in stage migration, which is greatest in early-stage disease [5,6].

Histopathological evaluation remains the gold standard for diagnosis of gynaecological malignancies. It also forms the foundation of immunohistochemical and molecular analysis. In this study, our objectives were to analyse the histopathological types of gynaecological malignancies and determine the frequency of distribution of these malignant neoplasms among patients who were managed surgically at our institute. We also evaluated the association between the type of gynaecological cancer and FIGO stage at presentation

Materials and Methods

This was a cross-sectional, observational study that included 465 cases of malignant neoplasms of female genital tract reported over ten years, from July 2015 to July 2025, in the Department of Pathology at a tertiary care centre, in Eastern India. Details of the patients and their histopathology reports were retrieved from the departmental archives. Identities of the patients were not disclosed at any stage of the study.

Histopathology slides were reviewed by two experienced pathologists, with no disagreements observed between them. The site, histologic type and histologic grade of tumours were noted. The pathologic stage in case of radical hysterectomies was recorded.

Cases of malignant neoplasms diagnosed in specimen of radical hysterectomy or biopsy from female genital tract were included in the study. Cases of benign, borderline and intraepithelial neoplasms and precursor lesions of malignancy diagnosed in specimen of radical hysterectomy or biopsy from female genital tract were excluded from the study.

Numerical variables were summarized using mean and range while categorical variables were described with counts and percentages. Chi-square test was used to analyse the frequency distribution of categorical data. P-values ≤ 0.05 was considered statistically significant.

Results

We reported 465 cases of gynaecological malignancies during the study period. Most of the cases were of cervical carcinoma (n: 335, 72.1 %) followed by ovarian carcinoma (n: 73, 15.6%) and endometrial carcinoma (n: 57, 12.3 %).

Cervical carcinomas were reported in both cervical biopsies (n: 274, 81.8 %) and specimen of radical hysterectomies (n:61, 18.2 %) . The average age at presentation was 55 years (range: 35- 80 years). Highest number of cases were reported in the age group 50- 59 years (n: 147, 43.6%) followed by 60- 69 years (n: 69, 20.6%), 40- 49 years (n: 65, 19.4%), 30- 39 years (n: 41, 12.2%) and 70- 80 years (n: 14, 4.2%). In cervix, squamous cell carcinoma (n: 318, 94.9%) was more common than adenocarcinoma (n: 17, 5.1%). Squamous cell carcinomas included well differentiated (n: 11, 3.2 %), moderately differentiated (n: 308, 92.1 %) and poorly differentiated (n: 16, 4.7 %) types [Fig 1]. Adenocarcinomas were categorised as well differentiated (n: 1, 11.1 %), moderately differentiated (n: 6, 66.7 %) and poorly differentiated (n: 2, 22.2 %). In patients who underwent radical hysterectomy, 51 (83.6%) cases were FIGO stage I, 5 (8.2%) cases were FIGO stage II and 5 (8.2%) cases were FIGO stage III.

We reported 73 cases of ovarian malignancies. There were 42 (57.2%), 5 (7.1%), 21 (28.6%), 3 (4.4%) and 2 (2.7%) cases of high-grade serous carcinoma, low grade serous carcinoma, mucinous carcinoma, yolk sac tumour and dysgerminoma respectively [Fig 2]. The mean age of malignant epithelial neoplasms was 51.7 years (range: 37- 60 years). 15 cases of high-grade serous carcinoma, 4 cases of mucinous carcinoma and one case of dysgerminoma had bilateral involvement. Remaining neoplasms presented in one sided ovary. Out of 21 cases of mucinous carcinoma 17 showed expansile invasive pattern and the rest (4) displayed stromal invasive pattern. According to FIGO 2021 staging system 53.4 % (n= 39) were stage I, 20.5 % (n= 15) were stage II, 13.8 % (n= 10) were stage III and 12.3 % (n= 9) were stage IV.

Our study had 57 cases of endometrial carcinoma out of which 51 underwent radical hysterectomies and 6 underwent endometrial biopsies. The mean age of patients at presentation was 65.5 years (range: 49- 70 years). The most common endometrial carcinoma was endometrioid type (n: 55; 96.5 %) followed by serous type (n: 2; 3.5 %;). Amongst the endometrioid endometrial carcinoma, 46 (83.6 %) were low grade and 9 (16.4 %) were high grade [Fig 3]. 51 cases of endometrial carcinoma diagnosed on radical hysterectomies were staged according to the FIGO 2023 system of reporting endometrial carcinoma. There were 54.9% (n:28), 29.4% (n:15) and 15.7% (n:8) cases in stage I, II and III respectively. None of the radical hysterectomies had stage IV disease. Stage distribution according to the 2009 FIGO system was: 74.5% (n:38), 7.8% (n:4), 17.6% (n:9) and 0 for stage I, II, III, and IV disease, respectively. Between the two systems, in the 2023 staging scheme, stage I distribution has decreased from 74.5% (n:38) to 54.9 % (n:28) whereas stage II distribution has increased from 7.8 % (n:4) to 29.4 % (n:15) and stage III distribution has decreased from 17.6% (n:9) to 15.7% (n:8).

The difference in frequency distribution of cervical carcinoma, ovarian carcinoma and endometrial carcinoma was statistically significant ($p< 0.001$) with cervical carcinoma occurring far more

frequently than the other two types. The chi square test revealed significant association between type of gynaecological cancer and FIGO stage at presentation ($p<0.001$).

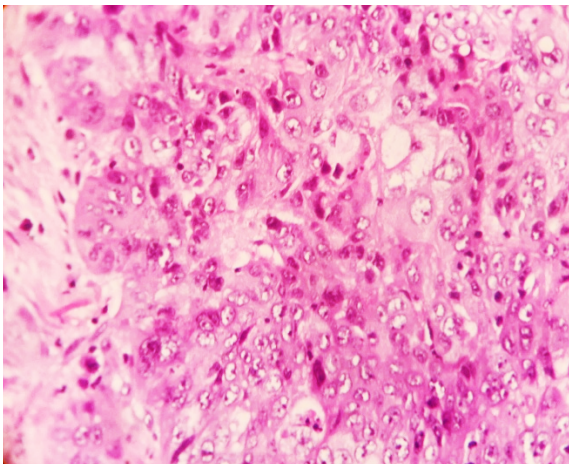

Figure 1: Moderately differentiated squamous cell carcinoma of cervix showing sheets of malignant squamous cells with hyperchromatic and pleomorphic nuclei and moderate eosinophilic cytoplasm. (H&E stain, X400).

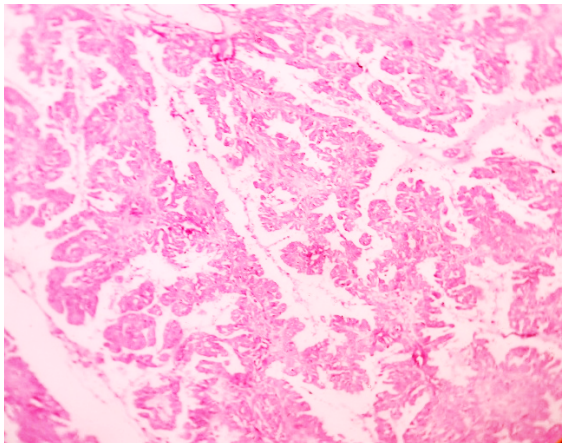

Figure 2: High grade serous carcinoma of ovary showing tumour cells arranged in papillary configuration (H&E stain, X100).

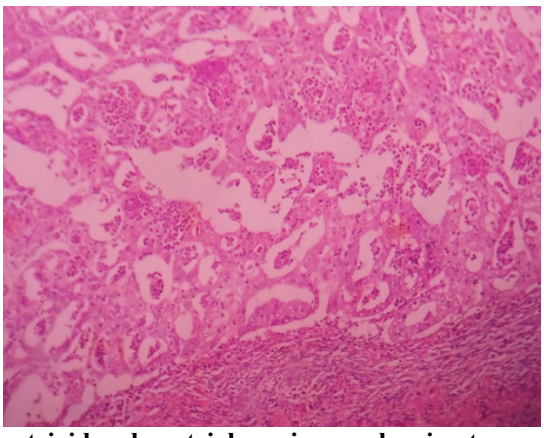

Figure 3: High grade endometrioid endometrial carcinoma showing tumour cells arranged in complex glandular configuration (H&E stain, X100).

Discussion

We diagnosed most of the cervical carcinomas in the age group 50- 59 years followed by 60- 69 years, 40- 49 years, 30- 39 years and more than or equal to 70 years. Shruthi PS et al noted similar findings with the highest number of cases in the age group of 40-59 years, followed by 60-80 years

and 20-39 years [7]. Globally SCC makes up about 80- 85% of cervical carcinomas whereas adenocarcinomas account for about 10- 25% [8]. In non-screened population adenocarcinomas constitute around 5% of all cervical carcinomas.

In most Indian series SCC is the predominant histological type of cervical carcinoma. Balasubramaniam G et al, in their study noted 89.5% SCC and 5.8% adenocarcinomas [9]. The findings are similar to our study. We reported 94.9% cases of SCC and 5.1% cases of adenocarcinoma.

The difference in number of cases of SCC between India and developed nations reflect that cytology-based screening of SCC precursor lesions is not widespread in our country and many women remain unscreened. Our institute predominantly caters to rural population where awareness regarding cervical carcinoma and its precursor lesions is low and women are reluctant to get themselves screened for the precursors. In addition to this, HPV DNA testing is not as prevalent as the developed nations.

The sampling procedure though simple, needs to be performed properly by trained personnel in order to minimise the chances of missing the precursor lesions. The cervical scraping if not taken from the junction of ectocervix and endocervix under proper visualisation, abnormal cells may not be detected.

Shruthi PS et al found moderately differentiated type to be the most common grade of SCC followed by poorly differentiated and well differentiated type. This is similar to our findings but we reported higher number (92.1%) of moderately differentiated type than them (56%) [9].

In our study the most common malignant ovarian tumours were high grade serous carcinoma followed by mucinous carcinoma and equal number of low-grade serous carcinoma and germ cell tumours. Amongst the malignant tumours reported by Mehra P et al high grade serous were most common followed by metastatic tumour, low grade serous, germ cell tumour and mucinous carcinoma [10]. Das PHA et al reported serous carcinomas to be the most common malignant ovarian tumour [11].

Upon staging, more than half of the cases belonged to stage I followed by stage II, III and IV. Das PHA et al had similar findings where stage I was commonest and stage IV was least common [11].

Most studies have revealed endometrioid endometrial carcinoma to be commonest type of endometrial carcinoma [12, 13]. Except two, all our cases were of endometrioid endometrial carcinoma. Low grade of the same were more common than high grade. This is similar to findings by Siegel RL et al [12]. Upon comparing the 2023 and 2009 FIGO staging system, stage shifting occurred in 23.5% cases of endometrial carcinomas. Based on 2023 staging scheme, 7.8% cases were upstaged from IA to IIC, and 13.7% were upstaged from IB to IIB. We have previously shown that this reflects the inclusion of histopathological criteria, including substantial LVSI, myometrial invasion, and aggressive histological type, into the staging system [14]. 1.9% of cases were down-staged from IIIA to IA. That was the case of synchronous presence of low-grade endometrioid carcinoma in the endometrium and low-grade endometrioid carcinoma in the right ovary. This stage must be differentiated from stage IIIA1, where there is extensive spread of endometrial carcinoma to the ovary [5].

The difference in frequency distribution of cervical carcinoma, ovarian carcinoma and endometrial carcinoma is statistically significant. Cervical carcinoma occurs far more frequently than the other two types. This reflects the persisting burden of cervical carcinoma in the society and is consistent with national and international epidemiological trends [15,16]. The strategies regarding cervical carcinoma need to be strengthened including increasing its awareness especially among rural women, widespread / mandatory screening programs, preventive vaccination and proper management.

There is significant association between type of gynaecological cancer and FIGO stage at presentation. This indicates that different gynaecological cancer present at different FIGO stage. Nevertheless, most of the cases of cervical, ovarian and endometrial cancer present at early stage (FIGO stage I and II). Ovarian cancers have higher proportion of advanced stage cases (FIGO stage III and IV) as compared to cervical and endometrial cancers

Conclusion

Our study reveals cervical carcinomas are the most common gynaecological malignant tumours followed by ovarian and endometrial cancers. This distribution aligns with the trend observed in the past several years and indicates the need for a more widespread screening system for cervical carcinoma. Most of the cases of cervical, ovarian and endometrial cancer present at early stage. Ovarian cancers have higher proportion of advanced stage cases as compared to cervical and endometrial cancers.

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