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Patterns of malignancies in female reproductive system: A five year retrospective study

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Abstract
Background: Female reproductive malignancies are fairly common, though largely unmanaged in our country. In India lack of awareness, poor socio-economic status of people, poor availability of diagnostic tools mainly contribute towards unattended morbidity of this group, which accounts to huge morbidity and mortality. It is thus important to have a reliable information profile of Female reproductive malignancies to have a better insight into their etiology.
Aims and Objectives: This retrospective study was conducted with the aim to establish the pattern of malignancies of female genital tract and their age wise distribution as seen in our institution of Hadoti region.
Materials and Methods: Our study included all female patients who were diagnosed on histopathology to have malignancy of female reproductive system during the period, Jan 2011 to Dec 2015 & their diagnosis was established on histopathological examination.
Results: In our study, a total of 577 malignancies were diagnosed, with cervical carcinoma being the most common. Out of the 577 cases, cervical carcinoma was present in 446 (77.29%) cases. Ovarian malignancies were 2ndcommonest with 66(11.43%) cases, followed by endometrial carcinoma, 53 (9.18%) cases. Uncommon sites were fallopian tube with 1 (0.17%) case, vaginal and vulvar cancers with 8(1.38%) cases & gestational trophoblastic tumors, 3 (0.51%) cases. Overall, most common age group affected was between 50-59 years with 176 (30.50%) cases & least common age group affected was less than 30 years with 22 (3.80%) cases. Among the cervical carcinoma, most common tumor was squamous cell carcinoma (71.75%) followed by adenocarcinoma (3.98%). Most common age group of presentation of cervical carcinoma was 41-50 years of age. Among the ovarian carcinoma, epithelial tumors were the most common with 34(51.51%) cases. Among the endometrial carcinoma, endometrioid tumors were the most common tumors.
Conclusion: Cervical carcinoma was the most common tumor in our study which correlates well with various studies conducted worldwide. However most common age group of presentation being 50-59 yrs which reflects the lack of awareness about screening programmes conducted in this area. Frequency of ovarian carcinoma was higher in our study as compared to other studies which requires further evaluation of risk factors and early diagnostic tools.

Keywords: Patterns of malignancies, cervical carcinoma, adenocarcinoma, endometrioid tumors.

Introduction
Cancers of the female reproductive system are an important cause of cancer morbidity and mortality worldwide. Cervical, endometrial, and ovarian cancers are relatively common whereas vulvar, vaginal, fallopian tube cancers, and choriocarcinomas are very rare. About 50-60% of all cancers among women in India are related mainly to the four organs; cervix uteri, breast, corpus uteri, and ovaries [1]. India's National Cancer Control Program emphasizes the importance of early detection and treatment. But there is no organized screening program and the majority of Indian women lack both awareness about the disease and access to prevention and treatment facilities. It is thus important to have reliable information of profile of Female reproductive malignancies to have a better insight into their etiology which will also help in identifying females who are in the utmost need of medical and surgical care and who need to be closely followed. It will also help in determining the strategies of prevention and target age group for implementing it.

Aims and Objectives
Primary aim of our study is to establish the frequency, distribution and various histopathological pattern of malignancies of female reproductive system presenting in our institution of Hadoti region which will help in ascertaining any regional preponderance of any particular malignancy, determining the strategies of prevention and target age group for implementing it.

Material and Methods

This retrospective study included all female patients who underwent surgical procedure for malignancies of reproductive system at MBS Hospital and NMCH Hospital and subsequently reported at the department of pathology, Government Medical College Kota during the period of Jan 2011 to Dec 2015 included in present study while who present with benign lesions or with infective lesions were excluded. Our study was carried on basis of proper statistical and histopathological standards.

The following parameters were specifically examined which included Histological type (WHO classification), Histological grade(On the basis of Architectural pattern, Nuclear pleomorphism and Mitotic activity into grade I,II and III.) and Tumour stage-(Clinical FIGO staging was done on all primary malignant tumours of female reproductive system as per guidelines provided by FIGO society).

Results

A total of 577 cases were found to be malignant which were included in this study.

Table 1: Frequency of Various Female Genital Tract Malignancy

S. No	Carcinoma	Number of cases	Percentage
1.	Cervical carcinoma	446	77.29%
2.	Ovarian malignancies	66	11.43%
3.	Endometrial carcinoma	53	9.18%
4.	Vaginal and vulval carcinoma	8	1.38%
5.	Gestational trophoblastic tumors	3	0.51%
6.	Fallopian tube carcinoma	1	0.17%
7.	Total	577	100.00%

In our study, we found that cervical carcinoma to be the most common carcinoma with 446 cases out of 577 cases which constituted 77.29% of total cases. Ovarian malignancies was the second most common malignancies with 66 cases out of 577 cases comprising 11.43% cases. Endometrial carcinoma represented as third most common carcinoma with 53 cases constituting 9.18% of total cases. Other uncommon carcinoma were those of arising from vagina and vulva comprising only 8 cases which constituted 1.38% and gestational trophoblastic tumors comprising 0.51%. Least common carcinoma was that of arising from fallopian tube comprising 0.17%.

Table 2: Age wise distribution of various female genital tract carcinoma

Age group	Cervical carcinoma	Endometrial carcinoma	Ovarian malignancies	Vulval and vaginal carcinoma	Gestational trophoblastic tumors	Fallopian tube carcinoma	Total
≤20 Years	0(0.00%)	0(0.00%)	10(1.73%)	0(0.00%)	0(0.00%)	0(0.00%)	10(1.73%)
21-30 Years	13(2.25%)	1(0.17%)	8(1.38%)	0(0.00%)	2(0.34%)	0(0.00%)	24(4.16%)
31-40 Years	79(13.69%)	1(0.17%)	13(22.53%)	1(0.17%)	1(0.17%)	1(0.17%)	96(16.64%)
41-50 Years	187(32.40%)	18(3.12%)	16(27.72%)	1(0.17%)	0(0.00%)	0(0.00%)	222(38.47%)
51-60 Years	95(16.46%)	19(32.93)	11(1.90%)	4(0.69%)	0(0.00%)	0(0.00%)	129(22.36%)
61-70 Years	56(9.77%)	9(1.55%)	8(1.38%)	0(0.00%)	0(0.00%)	0(0.00%)	73(12.65%)
>70 Years	16(2.78%)	5(0.866%)	0(0.00%)	2(0.34%)	0(0.00%)	0(0.00%)	23(3.98%)
Total	446(77.29%)	53(9.18%)	66(11.43%)	8(1.38%)	3(0.51%)	1(0.17%)	577(100.00%)

In our study, we found that most common age group of presentation of female genital tract malignancies was between 41-50 years with 222 cases representing 38.47% of total cases followed by age group between 51-60 years accounting for 22.36% cases. Age between 31-40 years & 61-70 years represented 16.64% & 12.65% respectively. Least common age group of presentation was before 20 years with only 10 cases accounting 1.73% cases.

Discussion

In our study, we included 577 cases of female genital tract malignancies.

Table 3: Distribution of various female genital tract malignancies worldwide

Author, place & year of publication	Type of study	Number of cases N	Cervix	Endometrium	Ovarian	Vagina & vulva	Gestational trophoblastic tumor	Fallopian tube
Jamal *et al*. Pakistan [6] 2006	Retrospective	N=968	231 (23.86%)	229 (23.66%)	411 (42.46%)	96 (9.96%)	-	1 (0.10%)
Momtahen *et al.* [9] Tehran 2009	Retrospective	N=450	88 (19.60%)	112 (24.90%)	250 (55.50%)	-	-	-
Rahman *et al.* [11] bangladesh 2014	Retrospective	N=185	120 (64.87%)	12 (6.49%)	44 (23.78%)	9 (4.86%)		-
Nnandi *et al.* [10] Nigeria 2014	Retrospective	N=404	274 (68.40%)	23 (5.70%)	46 (11.40%)	3 (0.80%)	58 (14.40%)	-
Jha *et al.* [7] Nepal 2015	Retrospective	N=62	44 (71.00%)	7 (11.50%)	9 (14.50%)	-	2 (3.00%)	-
Our study	Retrospective	N=577	446 (77.29%)	53 (9.18%)	66 (11.43%)	8 (1.38%)	3 (0.51%)	1(0.17%)

Cervical carcinoma

In our study, cervical carcinoma was the most prevalent carcinoma with 446 cases which constituted 77.29% cases. In most of the studies cervical carcinoma was the most prevalent carcinoma. Studies done by Rahman *et al.* [11], Nnandi *et al.* [10] & Jha *et al.* [7] showed distribution of cervical carcinoma to be 64.78%,68.40%&71.00% respectively. While the studies by Jamal *et al.* [6] found cervical carcinoma to be the 2nd commonest carcinoma with representation to be 23.86%.In the study of Momtahen *et al.* [9] cervical carcinoma was the 3rd commonest accounting for 19.60% cases.

Ovarian malignancies

Ovarian malignancies accounted for 66 cases with 11.43% representation & is the 2nd most common malignancies Studies done by Nandi *et al.* [10] showed similar distribution with11.40% cases. While in other studies prevalence was much higher than our study. Rahman *et al.* [11], Jamal *et al.* [6] & Momtahen *et al.* [9] in their studies found prevalence of ovarian malignancies to be 23.78%, 42.46% &55.50%.

Endometrial Carcinoma

In our study, endometrial carcinoma was the 3rd most common maliganancy constituting around 9.18% cases. Studies done by Rahman *et al.* [11] & Nnandi *et al.* [10] showed lesser representation of endometrial carcinoma 6.49% &5.70% respectively. While studies by Jamal *et al.* [6] & Momtahen *et al.* [9] showed higher representation 23.66% &24.90%

Vulval & Vaginal Malignancies

Carcinoma arising from vagina & vulval constituted 1.38% cases. While studies done by Jamal *et al.* [6] & Rahman *et al.* [11] showed higher prevelance 9.96% &4.86% respectively.

Gestational trophoblastic Tumor

In our study, representation of gestational trophoblastic tumor was very less,0.51% cases, as compared to the study done by Nnandi *et al.* [10] & Jha *et al.* [7] in which gestational trophoblastic tumor constituted 14.40% &3.00% cases.

Fallopian Tube Carcinoma

Fallopian tube carcinoma constituted around 0.17% cases in our study which was similar to the study done by Jamal *et al.* [6].

Table 4: Distribution of various female genital tract malignancies in India

Author, place & year of publication	Type of study	Number of cases N	Cervix	Endometrium	Ovarian	Vagina & vulva	Gestational trophoblastic tumor	Fallopian Tube
Agrawal *et al.* [1], elhi, 2012	Retrospective	1297	927 (71.63%)	129 (9.95%)	196 (15.11%)	44 (3.35%)		1 (0.08%)
Hemlata *et al.* [5], Karnataka 2013	Retrospective	475	358 (75.36%)	27 (5.68%)	71 (14.94%)	17 (3.57%)		-
Arya *et al.* [2] Uttar Pradesh 2013	Retrospective	267	193 (72.28%)	17 (6.37%)	32 (11.98%)	23 (8.61%)		2 (0.67%)
Venkata lakshmi *et al.* [8], Andhra Pradesh, 2016	Retrospective	183	135 (73.78%)	18 (9.84%)	20 (10.93%)	7 (3.82%)	3 (1.64%)	-
Our study	Retrospective	N=577	446 (77.29%)	53 (9.18%)	66 (11.43%)	8 (1.38%)	3 (0.51%)	1 (0.17%)

Distribution of various female genital tract malignancies in studies did by Indian authors have similar representation as in our study.

Cervical carcinoma in studies of Agrawal *et al.* [1], Arya *et al* [2], Hemlata *et al.* [5] & Venkat Lakshmi *et al.* [8] accounted 71.63%, 72.28%, 75.36% &73.77% respectively which was similar to our study.

Similarly ovarian malignancy was 2nd most common malignancy in studies of Agrawal *et al.* [1], Arya *et al.* [2], Hemlata *et al.* [5] & Venkat Lakshmi *et al.* [8] accounted 15.11%, 11.98%, 14.94% &10.90% cases respectively which was comparable to our study in which ovarian malignancy accounted for 11.43%.

Studies done by Agrawal *et al.* [1] & Venkata Lakshmi *et al.* [8] showed similar prevalence of endometrial carcinoma as in our study that is 9.95% & 9.845 respectively while studies by Arya *et al.* [2] & Hemlata *et al.* [5] showed lower prevalence that was 6.37% & 5.68% respectively.

Our study show less distribution of vagina & vulval malignancy which was 1.38% than the studies by Agrawal *et al.* [1], Arya *et al.* [2], Hemlata *et al.* [5] & Venkat Lakshmi *et al.* [8] in which these carcinoma accounted for 3.39%, 3.57%,8.61% & 3.82% respectively.

Distribution of fallopian tube carcinoma varies from 0.08% in study of Agrawal *et al.* [1] & 0.67% in Arya *et al.* [2] while in our study fallopian tube carcinoma constituted 0.175 cases.

Venkata Lakshmi *et al.* [8] study showed distribution of gestational trophoblastic tumor to be 1.64% which was higher than our study.

Table 5: Age wise distribution of female genital tract malignancy

Author, place & year of publication	Number of cases N	≤20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	≥70 years
Dalsaniya *et al*, [3] India, 2015	79	1 (1.27%)	7 (8.86%)	32 (40.50%)	27 (34.18%)	10 (12.65%)	2 (2.53%)	0 (0.00%)
Rahman *et al*. [11], Bangladesh, 2014	185	9 (4.86%)	17 (9.19%)	48 (25.94%)	69 (37.29%)	33 (17.83)	6 (32.43%)	3 (1.62%)
Deshpande *et al.* [4], India, 2012	262	2 (0.76%)	4 (1.52%)	39 (14.88%)	73 (27.86%)	70 (26.72%)	56 (21.37%)	18 (6.87%)
Our study	577	10(1.73%)	24(4.16%)	96(16.64%)	222(38.74%)	129(22.36%)	73(12.65%)	23(3.98%)

In our study, most common age group of presentation was 41-50 years which was similar to the study of Rahman *et al.* [11] & Deshpande *et al.* [4] while in the study of Dalsaniya *et al.* [3] most common age of presentation was 31-40 year. In age group less than 20 years presentation varies from 0.76% to 4.86% in the studies of Deshpande *et al.* [4] & Rahman *et al.* [11] respectively.

Summary & Conclusion

The current retrospective study of 577 cases was done to access the distribution of various female genital malignancies along with their histopathological variant & age wise distribution in Department of Pathology, Government Medical College, Kota from Jan 2011 to Dec 2015.

Diagnosis of female genital tract malignancies was confirmed on histopathological examination. Distribution of various female genital tract malignancies was studied in 577 cases. Their histopathological variant & age wise distribution was studied.

The results are summarised as:

1. A total of 577 cases of female genital tract malignancies were studied.
2. Cervical carcinoma was the most common carcinoma constituting 77.29% cases followed by second most common ovarian malignancies accounting for 11.43%. And third most common is endometrial malignancies represented 9.18% cases. Other uncommon malignancies were those arising from vagina & vulva comprising 1.38%cases, gestational trophoblastic tumor with 0.51% cases &fallopian tube carcinoma with 0.17% cases.

Most common age group of presentation was 41-50 years accounting 38.47% cases followed by 51-60 years with22.36% cases, 31-40 years with 16.64% cases, 61-70 years with 12.65% cases21-30 years with 4.16% cases. Least common age group of presentation was less than 20 years of age with only 1.73% cases.

As we found that etiology of female reproductive genital tract malignancies is multifactorial in nature, it is of utmost importance to conduct further studies that will gather detailed data on potential individual confounding factors including particular reproductive history and other factors that influence the body's hormonal environment, together with information on

socio-economic status and lifestyle factors, including physical activity from multiple sources.

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