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Original Research

Lumps and Bumps during Pregnancy - An Analysis of Benign and Malignant Masses

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ABSTRACT

Background: Tumors during pregnancy are rare but an increasingly recognized phenomenon, affecting approximately 1 in 1,000 pregnancies. The most prevalent malignancies during pregnancy are those of the breast, cervix, ovary, thyroid, melanoma, and haematologic origin; lung and gastric cancers are less common but have a poorer prognosis. The type of cancer, its stage, and the patient's preferences all influence the suggested course of treatment. The mainstays are systemic therapy and/or surgery. If surgery offers the best care, it is safe to have during pregnancy and shouldn't be postponed.

Methods: This was a retrospective, case-record-based study conducted on 20 pregnant women diagnosed with tumors attending the department of OBG, Father Muller Medical College, Mangalore, during 2017-2022. SPSS v21 was used to analyse the data. Student's t-test and ANOVA were utilized for analysis. For categorical data, a chi-square test was used. A p-value < 0.05 was considered significant.

Results: There were various malignancies encountered; the most common was serous cystadenocarcinoma of the ovary. We observed that only one ovarian carcinoma was diagnosed in stage IV with pulmonary metastases, while one patient with carcinoma rectum was diagnosed with liver metastasis. The patient with carcinoma rectum was counseled and advised medical termination of pregnancy. A combination of treatment modalities was initiated during pregnancy and postpartum.

Conclusion: This was a retrospective, case-record based study on women diagnosed with malignancy after conception during the present pregnancy. We observed that genitourinary malignancies were most common in frequency, followed by breast carcinoma. These are tumours mostly influenced by hormone levels. A multidisciplinary approach to management is vital to ensure the safe and effective treatment plans to balance between maternal and fetal health.

Keywords: Tumors, Pregnancy, Ovarian Carcinoma, Multidisciplinary Approach.

INTRODUCTION

Tumors during pregnancy are rare but an increasingly recognized phenomenon, affecting approximately 1 in 1,000 pregnancies. Up to 1 in 1,000–2,000 births are complicated by malignant disease, and the incidence of this condition is higher in developed nations because of the older age of the mother.[1-3] The most prevalent malignancies during pregnancy are those of the breast, cervix, ovary, thyroid, melanoma, and haematologic origin; lung and gastric cancers are less common but have a poorer prognosis.[4-6] Although pheochromocytomas and desmoid tumours can sometimes arise, their frequency is very modest, accounting for only 0.07% to 0.1% of all malignant tumours. The act of being pregnant is not a risk factor for cancer.

Obstetricians have particular difficulties in management and treatment, including moral, emotional, and therapeutic conundrums. Because treatment decisions affect both the woman and the foetus, treatment planning must be customised with a MDT (Multi-Disciplinary Team) that includes a gynaecological oncologist, clinical and medical oncologist, radiologist, and perinatologist.[7] Therefore, the choice to terminate a pregnancy or have an iatrogenic premature delivery is frequently highly difficult and necessitates a thorough and in-depth analysis of the case by the tumour board.

The prevalence of cancer in pregnancy is on the rise, driven in part by changing sociodemographic factors, particularly the trend of increasing maternal age as more women choose to delay starting families. Additionally, advancements in screening methods for fetal aneuploidies, such as NIPT (Non-Invasive Prenatal Testing), may inadvertently aid in the detection of occult malignancies.[8]

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The type of cancer, its stage, and the patient's preferences all influence the suggested course of treatment. The mainstays are systemic therapy and/or surgery. If surgery offers the best care throughout pregnancy, it is safe and shouldn't be postponed.[4] The best time to do it is in the first trimester, when the risk of miscarriage, premature birth, or restricted access is at its lowest.

AIM OF THE STUDY

To examine the prevalence, types, maternal and neonatal outcomes, and treatment modalities of tumors diagnosed during pregnancy at a tertiary care center in South India.

OBJECTIVES

1. To determine the demographic and clinical characteristics of pregnant women diagnosed with various tumors during pregnancy.
2. To analyze the prevalence of different types of cancers observed among pregnant women, with a focus on gynecological, hematological, and other systemic cancers.

MATERIALS & METHODS

This was a retrospective, case-record-based study conducted on 20 pregnant women diagnosed with tumor attending the department of OBG, Father Muller Medical College, Mangalore, during 2017-2022.

From all the case records with ICD codes matching tumour in any system were evaluated for completeness. Those with incomplete data, lack of follow-up, or doubtful diagnosis were excluded from the study.

All pregnant women with tumours diagnosed during pregnancy, a history of chemo/radiotherapy, demographic data, clinical details, details of pregnancy, as well as outcomes of the mother and child after delivery were recorded in a semi-structured proforma.

The various treatments delivered were also recorded, and the correlation was performed with the maternal outcomes.

Statistical Analysis

'SPSS v21' was used to analyse the data. Continuous data was represented as mean and standard deviation, while categorical data was represented as frequency. For the means, the student's t-test and ANOVA were utilized for analysis. For categorical data, a chi-square test was used. A 'p' value < 0.05 was considered significant.

RESULTS

In our study, the mean maternal age at diagnosis was found to be 29.71 +/- 6.71 years, and the gestational age at diagnosis was found to be 31.41 +/- 7.82 weeks at the first visit. The mean age of the patient at the first pregnancy was 26.71 +/- 6.82 years.

Demographic Details	Mean	Standard Deviation (SD)
Age (years)	29.71	6.71
First Pregnancy (weeks)	26.71	6.82
Gestational Age at Diagnosis (weeks)	31.41	7.82
Parity	2.31	0.81

Table 1: Demographic Data

Amongst the 20 patients, 5 cases were diagnosed in the first trimester, 9 in the second trimester, and 6 in the third trimester. There were various malignancies encountered, the most common being serous cystadenocarcinoma of the ovary.

Type of Cancer		Frequency
Gynaecological	Ovarian	5
	Cervical	2
	Uterine	1
Breast		4
Haematological	NHL	2
	HL	1
	AML	1
GIT	Rectum	2
	Colon	1
Hepatobiliary	HCC	1

Table 2: Different Types of Cancer During Pregnancy

In 13/20 patients, pregnancy was continued till term, following which staging was performed again, and appropriate treatment was initiated. Amidst these patients, two patients underwent medical termination of pregnancy (patients with mature cystic teratoma and carcinoma rectum). The patients with GIT and gynaecological malignancies underwent an elective C-section, while the remaining had a vaginal delivery.

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The mean period of gestation at delivery was 36.71 +/- 7.21 weeks. Five out of the 20 patients underwent a preterm delivery.

Type of Cancer		Stage I	Stage II	Stage III	Stage IV	Frequency
Gynaecological	Ovarian	1	2	1	1	5
	Cervical	1	1	0	0	2
	Uterine	0	1	0	0	1
Breast		0	3	1	0	4
Haematological	NHL	1	2	0	0	2
	HL	0	0	1	0	1
	AML	0	1	0	0	1
GIT	Rectum	1	0	0	1	2
	Colon	0	1	0	0	1
Hepatobiliary	HCC	0	0	1	0	1

Table 3: Stage of Cancer at the Time of Diagnosis

The patients were diagnosed in various stages of pregnancy. We observed that only one ovarian carcinoma was diagnosed in stage IV with pulmonary metastases, while one patient with carcinoma rectum was diagnosed with liver metastasis. The patient with carcinoma rectum was counselled and advised medical termination of pregnancy.

Treatment Modalities	Frequency
Chemo + Radiotherapy	4
Chemotherapy Only	4
Chemotherapy + Surgery	2
Surgery Only	7
Surgery + Chemoradiotherapy	3

Table 4: Treatment Modalities

A combination of treatment modalities was initiated during pregnancy and postpartum. The neonatal outcomes of 18 neonates were analyzed in this study. Two out of three neonates born prematurely to women with hematological malignancies required NICU admission. Of the eleven neonates born at term gestation, only one was observed to be growth-restricted with a birth weight of 2 kg, born to the mother diagnosed with a mixed germ cell tumor of the ovary.

The birth weights of a large proportion of neonates included in this study were observed to be between the 50th and 90th percentiles. In the patients that underwent medical termination of pregnancy, the foetus showed no evidence of congenital anomalies.

Maternal Outcomes	Gynaecological	Breast	Haematological	GIT
Remission	5	3	2	3
Recurrence	1	0	1	0
Metastasis	1	1	0	0
Death	1	1	1	1

Table 5: Outcome of Various Cancers During Pregnancy

The chi-square statistic was 0.6611. The p-value was 0 .9999. The result was not significant at $p < 0.05$.

Complication	Frequency
Ascites	3
Intestinal Obstruction	2
Severe Anaemia	3

Table 6: Various Complications

The patients developed different complications along with tumour during pregnancy. The different complications observed were ascites, intestinal obstruction and severe anemia. In this study we observed that there were 3 patients with ascites, 2 with intestinal obstruction, and 3 with severe anemia. These complications were taken care of along with tumour management during the continuation of pregnancy in these patients.

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DISCUSSION

In our study, the most frequently encountered cancer types in pregnancy were ovarian, breast, and hematological malignancies, unlike other studies, which described proportionally more cases of cervical and thyroid cancers.

The pathophysiology of cancer associated with pregnancy is not fully understood. However, hormonal changes, immunological suppression, increased permeability, and vascularization have been attributed. In this study, the mean age of the patient at the first pregnancy was 26.71±6.82 years.

In a study conducted by Ali Eishiet al., the mean age at diagnosis of cancer during pregnancy was found to be between 29.71±6.71 years, which was consistent with our study results.[9]

However, the mean gestational age at diagnosis of cancer in our study was noted to be 31.41±7.82 weeks, in contrast to the study results of Kristel Van Calsteren et al., which showed that the mean gestational age at diagnosis of cancer was 21.0±10.8 weeks.[10] Early pregnancy dating allows precise gestational age calculation at diagnosis and therapy.[11,12] In India, while obstetric ultrasounds are easily available, most women do not seek antenatal care promptly.

Surprisingly, we didn't observe any thyroid malignancies or adrenal malignancies in our patients, despite it being the second most common malignancy diagnosed during pregnancy.

Although the vast majority of participants in our study were found to have achieved remission, deaths were also observed due to complications following combined treatment involving surgery, chemotherapy and radiotherapy among pregnant women with cancer. In our study, neonatal outcomes showed no significant correlation with the type or stage of cancer or the treatment modality received by the pregnant women. This is likely because most participants delivered at term and started chemotherapy during the postpartum period.

Oncologic patients are frequently scheduled for delivery to minimize treatment-free periods and improve maternal outcomes. It is recommended that surgeons deliver the fetus after 37 weeks to avoid prematurity-related newborn problems and long-term damage. Cesarean section rates in our patients were over 30%, compared to 21% worldwide.[13] The need for a planned and controlled delivery in oncologic patients under psychological stress and physical weariness may explain this higher rate. Vaginal birth reduces neonatal and maternal problems unless prohibited in conditions such as cervical and vulvar malignancies where there were risks of cancer cell implantation in the tear/episiotomy site.[14] Multiple factors need to be considered while deciding the management for these patients. Hence, oncology and obstetric professionals must work together to plan obstetric and perinatal therapy for cancer patients.[15,16]

Many symptoms, including bleeding, bowel pattern changes, and breast changes, are mistaken for those of a typical pregnancy, which frequently results in delays in diagnosis. Most malignant diagnoses (>60%) are made during the postnatal stage. There is no solid evidence to support the idea that cancer is more progressed at this stage of diagnosis. Another diagnostic difficulty during pregnancy is appropriate imaging.[17,18] Although ultrasound is generally regarded as a safe technique, it is insufficient for staging cancer. MRI (Magnetic Resonance Imaging) and other non-ionizing radiation techniques are considered safe during pregnancy and effective in imaging solid or soft tissue tumours.[19] According to research, diffusion-weighted MRI may be used in place of PET-CT (Positron Emission Tomography) for the identification of distant or nodal metastases. Additionally, data points to the possibility of distant bone metastases, solid tumours, and lymphomas.[20]

Women should be sent to a tertiary hospital for their ongoing care and discussed at a suitable multidisciplinary meeting, much like the general population. Obstetric and gynecological involvement is essential because the majority of professionals will lack experience in caring for pregnant patients. Even if the prognosis is frequently challenging, it is crucial that women receive the right kind of counselling. Patients' decision-making will be influenced by clear information about the prognosis, especially whether the therapy will be palliative or curative.[21] Patients should receive sufficient information about how pregnancy affects the cancer diagnosis and how possible treatments may affect the developing fetus. The prognosis for some hormone-dependent malignancies, including melanoma, breast, and vulva, appears to be worse during pregnancy, according to a meta-analysis and systematic review.[22] Comparison is challenging, though, due to confounding factors such as disparities in treatment choices and delays in diagnosis. Similarly, other investigations have found that if the same medications are provided to pregnant patients, the prognosis is the same.[23]

Prematurity rates were 5%, neonatal transitory myelosuppression rates were 4%, neonatal mortality rates were 1%, and intrauterine mortality rates were 5% in a recent study of 376 cases of in utero exposure to chemotherapeutic drugs. Preterm birth is linked to neurological abnormalities and cerebral palsy. Thus, extending the pregnancy as long as feasible till after 35 weeks is essential.[24] Concomitant placental involvement should be carefully confirmed after delivery in high-risk instances. Malignant tumours seldom spread vertically; just 62 occurrences have been reported. However, there have been no reports of foetal involvement in gynaecological cancer. Since the majority of chemotherapeutic drugs are transferred to breast milk, breastfeeding during chemotherapy is not advised.[25]

Following chemotherapy, supportive care might be given in addition to the standard advice. During or after chemotherapy, nausea and vomiting are common side effects for most patients. Fetal abnormalities are

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not linked to antiemetic treatment with metoclopramide, antiserotonin medications, or antihistaminic medications.[26]

Antibiotics should be administered to expectant mothers who have neutropenic fever following chemotherapy. Chemotherapy should be postponed until week 14 of pregnancy since the hematopoietic system, genitalia, eyes, and central nervous system are susceptible during organogenesis.

The impact of postponing treatment on maternal survival should be considered when thinking about chemotherapy during pregnancy. Chemotherapy should be stopped three to four weeks prior to birth, particularly after 35 weeks of pregnancy, as hematological toxicity puts both the mother and the fetus at risk for infections and hemorrhage during delivery.[27]

CONCLUSION

This was a retrospective, case-record-based study on women diagnosed with malignancy after conception during the present pregnancy. We observed that genitourinary malignancies were most common in frequency, followed by breast carcinoma. These are tumours mostly influenced by hormone levels. The majority of the patients were managed with concomitant surgery and safe delivery of the fetus, with or without chemoradiotherapy. The gestational age at delivery is important to improve maternal and fetal outcomes. To guarantee that the mix of clinical variables, patient requests, and morally difficult decisions are all taken into account, a multidisciplinary approach to management is essential. The delicate balance between the health of the mother and the fetus can be managed with safe and efficient treatment methods. Women should always be well-informed, feel empowered by the information they receive, and understand the many treatment options, their complications, and how they may affect the fetus or their pregnancy. To sum up, regular cancer treatment ought to be advised in order to improve the odds of survival for mothers. Delays in therapy should be avoided, nevertheless. Lastly, the study should concentrate on the problem of gynecologic cancer during pregnancy.

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