

CLINICAL PROFILE, TREATMENT STRATEGIES, AND OUTCOMES OF MUCINOUS OVARIAN CARCINOMA AT A TERTIARY CARE CENTRE: A CROSS-SECTIONAL OBSERVATIONAL STUDY

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ABSTRACT

Background: Mucinous ovarian carcinoma (MOC) is a rare subtype of epithelial ovarian cancer with distinct clinicopathological behaviour, treatment response, and prognosis. Region-specific real-world data are limited. This study evaluated the clinical profile, treatment patterns, and outcomes of patients with MOC managed at a tertiary care centre. **Materials and Methods:** This retrospective observational study included patients with histopathologically confirmed MOC treated at a tertiary care oncology centre. Demographic, clinical, tumour, treatment, and follow-up details were retrieved from medical records. Data were analysed using descriptive statistics. **Result:** The mean age was 47.6 ± 13.34 years, with most patients being multiparous (80%) and postmenopausal (60%). Abdominal distension was the commonest symptom (53.3%), and 60% presented within 2 months of symptom onset. Tumours were unilateral in 70% of cases, and CA-125 was elevated in 73.3%. Half of the patients were diagnosed in Stage I (46.7%), while 33.3% and 10% had Stage III and IV disease; 10% had incomplete staging. Upfront surgery was performed in 66.7%, interval cytoreduction in 3.3%, and 20% did not undergo surgery. Chemotherapy was administered to 86.7% of patients, and treatment intent was curative in 90%. During follow-up, 13.3% developed recurrence, 60% were alive, and 20% had died, while 20% were lost to follow-up. **Conclusion:** MOC commonly presents in peri- and postmenopausal women with short-duration abdominal distension and is frequently unilateral and early stage at diagnosis. Upfront surgery with adjuvant chemotherapy was the predominant treatment approach, with low recurrence and favourable short-term survival.

INTRODUCTION

Ovarian cancer is one of the leading causes of cancer-related mortality among women worldwide and is characterised by late presentation and poor survival outcomes. It is the seventh most common malignancy in women and the eighth leading cause of cancer death globally. It is a heterogeneous group of neoplasms with diverse histopathological subtypes, each showing distinct biological behaviour, response to therapy, and prognosis.^[1] Epithelial ovarian cancers constitute the majority of ovarian malignancies, among which mucinous ovarian carcinoma (MOC) is a relatively rare and unique. Unlike high-grade serous carcinoma, mucinous tumours have different molecular, pathological, and clinical characteristics and should be managed differently from other epithelial tumours.^[2] Primary

MOC accounts for a small proportion of epithelial ovarian cancers and presents at an earlier stage, with only about 15–20% of patients having advanced disease at diagnosis. These tumours tend to occur in younger women and are often unilateral and large at presentation.^[3]

MOC has unique clinicopathological features, and one of the most important issues is differentiating primary MOC from metastatic mucinous tumours involving the ovary, as this significantly influences treatment decisions and prognosis.^[2] Different invasive patterns, such as expansile and infiltrative types, have been shown to correlate with stage at presentation, nodal involvement, recurrence-free survival, and overall prognosis. A study reported a 5-year survival of approximately 90% for expansile tumours compared with nearly 60% for infiltrative tumours.^[4]

Standard treatment includes comprehensive staging surgery, and in selected early-stage patients, fertility-preserving procedures may be considered when the disease is confined to one ovary. Cytoreductive surgery has an important role in advanced disease and in recurrent settings when complete gross resection is feasible.^[3] Unlike high-grade serous carcinoma, mucinous tumours have limited responsiveness to conventional platinum- and taxane-based chemotherapy, and gastrointestinal-type chemotherapy regimens have been explored as alternative strategies. Population-based analyses have also shown minimal survival benefit from chemotherapy or debulking in advanced-stage disease, and have suggested the need for personalised therapeutic approaches.^[3,5]

Early-stage disease carries an excellent outcome with survival rates exceeding 80–90%, whereas advanced-stage tumours have significantly poorer survival, with outcomes comparable to metastatic mucinous tumours involving the ovary.^[6,7] This difference in survival between early and advanced stages highlights the importance of early detection, optimal staging, and complete cytoreduction. Even though the MOC has a unique behaviour, there is only a limited amount of large-scale data, particularly from developing countries. Most available studies are from Western populations, and there is a lack of region-specific data evaluating the clinical profile, treatment patterns, and survival outcomes. Real-world evidence from tertiary care centres is essential to improve understanding of disease characteristics, guide management strategies, and aid in prognostication. Hence, this study aims to evaluate the clinical profile, treatment strategies, and outcomes of patients with mucinous carcinoma of the ovary managed at a tertiary care centre.

Objectives: To study the demographic, clinical, and histopathological profile, including stage at presentation, of patients with MOC. To evaluate the treatment strategies and clinical outcomes, including surgical management, cytoreduction, survival, and recurrence.

MATERIALS AND METHODS

This retrospective observational study was conducted in the Department of Medical Oncology, Thanjavur Medical College, Tamil Nadu, India, from 2018 to 2023. Ethical clearance was obtained from the Institutional Ethics Committee prior to data collection.

Inclusion and exclusion criteria

All patients with histopathologically confirmed mucinous carcinoma of the ovary who received evaluation and/or treatment during the study period

were included. Patients with incomplete medical records, non-mucinous histology, borderline tumours, or metastatic mucinous tumours to the ovary were excluded from the study.

Methods: Eligible cases were identified from the medical oncology records and hospital database. Demographic details, including age at diagnosis, parity, menopausal status, and region of residence, were recorded. Clinical presentation was assessed based on the presenting symptoms and duration of symptoms at the time of diagnosis.

Tumour-related variables such as laterality, serum CA-125 levels, histopathological type, grade, and FIGO stage were obtained from surgical records, pathology reports, and imaging findings. Staging was based on available operative findings and radiological documentation. Cases with incomplete surgical staging were recorded separately.

Treatment details were collected, including intent of treatment (curative or otherwise), type of primary surgery (upfront surgery or interval cytoreduction), and administration of chemotherapy. Patients who did not undergo surgery were also documented. Information regarding chemotherapy included whether it was received or not, based on treatment records.

Outcome measures included relapse status and survival status at the last follow-up. Survival status was categorised as alive, expired, or defaulted/unknown. Recurrence was identified based on clinical, radiological, or biochemical evidence as documented in follow-up records.

Statistical analysis: Data were entered into Microsoft Excel and analysed using IBM SPSS version 25.0. Continuous variables were expressed as mean and standard deviation, while categorical variables were presented as frequency and percentage. Descriptive statistics were used to summarise the demographic profile, clinicopathological characteristics, treatment patterns, and outcomes of patients.

RESULTS

The mean age of the study population was 47.6 ± 13.34 years, and the majority of patients were multiparous (80%). Most women were postmenopausal (60%) and belonged to urban areas (56.7%). Abdominal distension (53.3%) was the most common presenting symptom, followed by abdominal pain (23.3%), while the presenting complaint was not specified in 13.3% of cases. Regarding symptom duration, the majority of patients (60%) presented within 2 months, 23.3% had symptoms for 2–4 months, and 16.7% had symptoms for >4 months prior to diagnosis [Table 1].

Table 1: Baseline demographic and clinical presentation

Parameters	Category	Values
Age (years)	Mean ± SD	47.6 ± 13.34
Parity	Nullipara	3 (10%)
	Unipara	3 (10%)
	Multipara	24 (80%)
Menopausal Status	Premenopausal	12 (40%)
	Postmenopausal	18 (60%)
Region	Urban	17 (56.7%)
	Rural	13 (43.3%)
Symptoms	Abdominal distension	16 (53.3%)
	Pain abdomen	7 (23.3%)
	Bleeding per vaginum	2 (6.7%)
	Vaginal discharge	1 (3.3%)
	Not specified	4 (13.3%)
Duration of Symptoms	< 2 months	18 (60%)
	2-4 months	7 (23.3%)
	> 4 months	5 (16.7%)

Most tumours were unilateral (70%), while 30% were bilateral. Elevated CA-125 levels (>35 U/mL) were observed in 73.3% of patients, whereas 26.7% had values within the normal range. Nearly half of the

patients (46.7%) were diagnosed in Stage I, while 33.3% in Stage III, 10% in Stage IV and 10% had incomplete surgical staging [Table 2].

Table 2: Tumour Characteristics and Stage Distribution

Parameters	Category	n (%)
Laterality	Unilateral	21 (70%)
	Bilateral	9 (30%)
CA-125 (U/mL)	≤35	8 (26.7%)
	>35	22 (73.3%)
Stage	Stage I	14 (46.7%)
	Stage II	0
	Stage III	10 (33.3%)
	Stage IV	3 (10%)
	Incomplete staging	3 (10%)

The majority of patients were treated with curative intent (90%), while the intent was not specified in 10% of cases. Upfront surgery was performed in 66.7% of patients, whereas 3.3% underwent interval cytoreduction. Incomplete staging was noted in 10%, and 20% of patients did not undergo any surgical intervention. 86.7% of patients received

chemotherapy, while 13.3% either did not receive it or the details were unclear. During follow-up, relapse occurred in 13.3% of patients, whereas 86.7% remained disease-free. At the time of last follow-up, 60% of patients were alive, 20% had expired, and the survival status was unknown or defaulted in 20% of cases [Table 3].

Table 3: Treatment Patterns and Clinical Outcomes

Parameters	Category	n (%)
Intent of Treatment	Curative	27 (90%)
	Not specified	3 (10%)
Surgery	Upfront surgery	20 (66.7%)
	Interval cytoreduction	1 (3.3%)
	Incomplete staging	3 (10%)
	No surgery	6 (20%)
Chemotherapy	Received	26 (86.7%)
	Not received/unclear	4 (13.3%)
Relapse	Yes	4 (13.3%)
	No	26 (86.7%)
Survival Status	Alive	18 (60%)
	Expired	6 (20%)
	Defaulted/unknown	6 (20%)

DISCUSSION

Ovarian mucinous carcinoma is a unique and rare subtype of epithelial ovarian cancer with different clinicopathological behaviour, treatment response, and survival outcomes compared with other epithelial tumours. This study evaluated patients with

histopathologically confirmed mucinous carcinoma of the ovary treated at a tertiary care centre, and focused on clinical presentation, pathological features, surgical management, use of chemotherapy, relapse patterns, and survival status at follow-up. In our study, the mean age of the study population was 47.6 ± 13.34 years, and the majority of patients were multiparous. Most women were

postmenopausal, and abdominal distension was the most common presenting symptom, followed by abdominal pain. The majority of patients presented within 2 months, while a few had symptoms for >4 months before diagnosis. Hamdani et al. reported that the median age was 36 ± 12.4 years, and the most common presentation was abdominal distension (54.3%), while the rest were abdominal pain and irregular menstruation.⁸ Chen et al. reported a mean age of 40.16 ± 5.03 years, and most presented abdominal distension (50.9%), abdominal pain (42.7%), and abnormal vaginal bleeding (17.5%).^[9] Lurie et al. reported that compared to women diagnosed with serous carcinoma, women with mucinous tumours have 2.6 times higher chances of reporting a distended abdomen.^[10] These findings suggest close monitoring of women presenting with new-onset abdominal distension, especially in the peri- and postmenopausal age group, to enable earlier imaging, timely diagnosis, and appropriate surgical referral.

In our study, most tumours were unilateral, and most had elevated CA-125 levels (>35 U/mL). The majority of the cases were mucinous carcinoma, and nearly half of the patients were diagnosed in Stage I. Similarly, Seidman et al. reported that among mucinous carcinomas involving the ovary, 77% were metastatic and 23% were primary. Primary tumours were predominantly unilateral (83%) and large (mean size 20 cm), whereas metastatic lesions were commonly bilateral (76%) and smaller (<10 cm in 68%). Most primary ovarian mucinous carcinomas presented in Stage I (75%).^[11] Morales-Vásquez et al. analysed 1009 patients with epithelial ovarian cancer and found that abnormal pretreatment CA-125 levels were present in 99% of serous, 89% of endometrioid, and 69% of mucinous tumours.^[12] Tian et al. re-evaluated 33 cases initially diagnosed as primary ovarian mucinous carcinoma and confirmed only 18 true primary tumours (5.2% of all epithelial ovarian cancers). These tumours occurred in younger patients (mean age 39.7 years) and were predominantly stage I (94.4%) and low-grade, with unilateral involvement, low ascites volume and lower preoperative CA-125 levels compared with serous carcinoma (all $p < 0.05$).^[13] The comparatively lower CA-125 elevation observed in previous studies indicates that normal or mildly raised CA-125 levels do not rule out malignancy in these patients. Therefore, tumour laterality, size, stage at presentation, and correlation with imaging and histopathology are important for accurate diagnosis and surgical staging.

Upfront surgery was the most commonly used treatment approach in our study, and the majority of patients received adjuvant chemotherapy. During follow-up, relapse occurred in a few patients, and 20% had expired. Similarly, Mackay et al. analysed 8704 women with stage III–IV epithelial ovarian cancer and showed that all patients underwent primary cytoreductive surgery followed by platinum–taxane chemotherapy. These subtypes had

significantly poorer outcomes, with median overall survival of 14.6 months for mucinous and 21.3 months for clear cell carcinoma compared with 40.8 months for serous tumours.^[14] Meena et al. reported that among patients with epithelial ovarian cancer, 30.1% underwent primary cytoreduction, 34.7% interval cytoreduction, 23% staging laparotomy, and 12.2% received palliative chemotherapy alone, with optimal debulking achieved in 62%.^[15] Kurnit et al. evaluated 140 patients with stage I–II uterine carcinosarcoma and reported a median overall survival of 48 months, with recurrence occurring in 51% during follow-up. Although 63% received adjuvant therapy, survival was determined by clinicopathologic factors rather than treatment modality.^[3] Across the studies, primary cytoreductive surgery followed by platinum-based chemotherapy is the main management strategy. However, upfront surgery was mostly used in our study, which could be due to the differences in institutional protocols, surgeon preference, resource availability, and referral patterns. Survival outcomes for mucinous tumours are worse compared to other epithelial subtypes, particularly in advanced stages.

Limitations

The retrospective design is associated with selection bias and dependence on the accuracy and completeness of medical records, which resulted in missing or unspecified data for certain variables such as presenting symptoms, treatment intent, survival status, and details of chemotherapy regimens. The study was conducted at a single tertiary care centre with a relatively small sample size, which limits the generalisability of the results. The duration of follow-up was not uniform for all patients, and some cases were defaulted or had unknown survival status, making accurate estimation of disease-free survival and overall survival difficult. Being a descriptive study, survival analysis using Kaplan–Meier curves and multivariate analysis to identify independent prognostic factors could not be performed. Detailed pathological parameters such as tumour size, invasive pattern (expansile vs infiltrative), lymph node status, molecular profile, and type of chemotherapy regimen were not available, which are known to influence prognosis and treatment response in MOC.

CONCLUSION

Mucinous carcinoma of the ovary is predominantly presented in peri- and postmenopausal women with abdominal distension of short duration. Most were unilateral and diagnosed at an early stage. Upfront surgery with curative intent was the most common treatment, and the majority of patients received adjuvant chemotherapy. Many had favourable outcomes, with a low recurrence rate and remained disease-free at follow-up. Larger prospective multicentric studies with uniform staging, detailed pathological stratification, and longer follow-up are required for a better understanding of prognostic

factors and to optimise stage-specific management strategies for MOC.

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