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Original Article

Clinical Profile of Patients with Ovarian Tumors: A Study in a Tertiary Care Hospital in Bangladesh

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ABSTRACT

Background: Ovarian tumors encompass a diverse spectrum of benign, borderline, and malignant neoplasms, each with distinct clinical behaviors. In Bangladesh, systematically documented data on their comprehensive clinical and histopathological profile remain sparse, hindering early diagnosis and optimal therapeutic decision-making. **Objective:** To delineate the sociodemographic, clinical, and histopathological spectrum of ovarian tumors in a tertiary care setting in Bangladesh. **Methods & Materials:** This prospective cohort study was conducted at Khulna Medical College Hospital, Khulna, Bangladesh, from January 2021 to December 2021. A total of 53 women with radiologically or clinically suspected ovarian masses were enrolled via purposive sampling. Baseline demographic data, presenting complaints, and physical examination findings were recorded. All participants underwent surgical exploration, and histopathological examination was performed post-operatively. Data were analyzed using SPSS version 23.0. **Results:** The mean age was 42.3±12.7 years, with the highest incidence (37.7%) in the 41-50 year's age group. Abdominopelvic pain (62.3%) and abdominal distension (49.1%) were the predominant presentations. Histopathologically, benign tumors constituted 64.2%, borderline 11.3%, and malignant 24.5%. Among malignancies, serous cystadenocarcinoma was the most frequent subtype (46.2%), followed by mucinous cystadenocarcinoma (30.8%). **Conclusion:** Ovarian tumors in our cohort predominantly affect perimenopausal women and often present with non-specific abdominal symptoms. The substantial proportion of malignant cases underscores the need for heightened clinical suspicion and improved access to histological evaluation in Bangladesh.

Keywords: *Clinical profile, Histopathology, Ovarian neoplasms, Ovarian tumors, Perimenopausal.*

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INTRODUCTION

Ovarian tumors represent a remarkably heterogeneous group of neoplasms, encompassing benign cystic lesions, tumors of borderline malignancy, and highly aggressive carcinomas that rank among the deadliest gynecological malignancies worldwide. Globally, ovarian cancer accounts for approximately 4% of all female cancers but is responsible for a disproportionately higher share of cancer-related mortality, largely due to its propensity for silent progression and late-stage diagnosis [1,2]. The Global Cancer Observatory (GLOBOCAN) estimates that nearly 325,000 new cases and 207,000 deaths occur annually, with a steady upward trajectory projected in low- and middle-income countries (LMICs) as populations age and lifestyle transitions occur [3]. Clinically, the diagnosis of ovarian tumors is fraught with challenges. The early stages of the disease are notoriously asymptomatic, and even when symptoms such as abdominal bloating, pelvic discomfort, early satiety, or urinary frequency develop, they are characteristically vague and readily mimic benign gastrointestinal or urological conditions [4,5]. Consequently, over 70% of women with malignant ovarian tumors are diagnosed at advanced stages (FIGO III or IV), where peritoneal dissemination and omental involvement have already occurred. This diagnostic delay has devastating prognostic implications; the overall 5-year survival rate for advanced ovarian cancer remains below 30%, whereas it exceeds 90% for patients diagnosed at a localized stage [5,6]. Thus, a comprehensive understanding of the clinical presentation and pathological spectrum is vital for timely triage and management. Histopathologically, the World Health Organization (WHO) Classification of Female Genital Tumours, 5th edition, categorizes ovarian neoplasms into three principal lineages: epithelial tumors, germ cell tumors, and sex cord–stromal tumors [7]. Epithelial tumors, originating from the ovarian surface epithelium or fallopian tube mucosa, constitute the largest group, accounting for 60–70% of all ovarian neoplasms and the vast majority of malignancies. Among these, serous carcinoma is the most frequently encountered subtype, followed by mucinous, endometrioid, and clear cell carcinomas. Importantly, these subtypes exhibit distinct molecular drivers, natural histories, and therapeutic responses, underscoring the necessity of accurate histopathological distinction [8]. Borderline epithelial tumors, also known as low malignant potential tumors, represent an intermediate tier with a more favorable prognosis, further complicating the clinical trajectory and requiring careful diagnostic evaluation [9]. In Bangladesh, a densely populated lower-middle-income country with a rapidly growing healthcare infrastructure, the epidemiological and clinical landscape of ovarian tumors remains largely uncharted. The majority of women present to tertiary care facilities only when abdominal enlargement or pain becomes conspicuous, often after extensive consultations with general practitioners. This pattern reflects a combination of limited cancer awareness, inadequate screening programs, and restricted access to specialized gynecological oncology services in rural areas [10]. Prior local studies, albeit limited in number and scope, have indicated that benign tumors predominate in younger cohorts, while malignant lesions become more frequent in perimenopausal and postmenopausal women; however, these findings are drawn from small retrospective series with heterogeneous methodologies [11]. Moreover, the distribution of specific histological subtypes in the Bangladeshi population has not been rigorously characterized using contemporary WHO criteria, leaving a critical gap in guiding regional diagnostic algorithms and resource

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allocation [12]. Against this backdrop, systematic prospective data on the clinical profile of ovarian tumors in Bangladesh are urgently needed to inform screening strategies, improve preoperative counseling, and refine surgical planning. Understanding the age distribution, symptomatology, and histopathological breakdown within a defined local cohort can help clinicians identify high-risk subgroups and adapt management protocols accordingly. The present study was therefore designed to delineate the sociodemographic, clinical, and histopathological spectrum of ovarian tumors among patients presenting to a tertiary care hospital in Dhaka, Bangladesh, thereby contributing foundational evidence to a previously underexplored domain.

METHODS & MATERIALS

This prospective cohort study was conducted at Khulna Medical College Hospital, Khulna, Bangladesh, from January 2021 and December 2021. The study population comprised all women presenting to the Department of Gynecology and Obstetrics with a clinically or radiologically suspected ovarian mass during the enrollment period.

Inclusion criteria: Women aged ≥18 years with a confirmed ovarian mass on pelvic ultrasonography, who provided written informed consent, and who underwent definitive surgical management (laparotomy or laparoscopy) with subsequent histopathological examination of the excised specimen were included in the study.

Exclusion criteria: Pregnant women, patients with a prior history of bilateral oophorectomy or hysterectomy, those diagnosed with non-ovarian pelvic masses (e.g., uterine fibroids, tubo-ovarian abscess), and individuals with incomplete clinical or pathological records were excluded from the analysis.

Study procedure: Participants were enrolled using a purposive sampling technique. A structured proforma was used to record detailed demographic data, presenting complaints, and physical examination findings. All patients underwent preoperative pelvic ultrasonography and serum CA-125 measurement. The preoperative risk of malignancy was calculated using the Risk of Malignancy Index (RMI), derived from ultrasound morphological score, menopausal status, and serum CA-125 concentration, following the established scoring algorithm [13]. All surgically resected specimens were sent for routine formalin-fixed, paraffin-embedded histopathological evaluation, and tumors were classified according to the World Health Organization (WHO) 2020 criteria.

Data analysis: All collected data were entered into a Microsoft Excel spreadsheet and analyzed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were expressed as frequencies, percentages, means, and standard deviations. Associations between categorical variables were assessed using the Chi-square test, with a p-value <0.05 considered statistically significant.

RESULT

A total of 53 women with suspected ovarian masses who met the inclusion criteria were enrolled and completed the study protocol. The mean age of the participants was 42.3±12.7 years, with the majority (37.7%) falling within the 41–50 years age bracket (*Figure 1*).

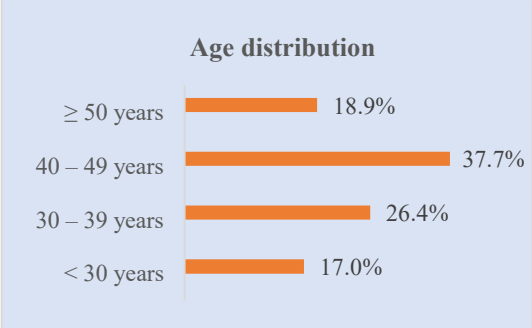

Figure 1: Age distribution of the study participants (*n*=53).

Nearly three-fifths (58.5%) of the patients were premenopausal, while 41.5% were postmenopausal. Regarding residence, 67.9% hailed from urban or peri-urban areas, whereas 32.1% resided in rural localities. Clinically, the presenting symptoms were diverse and frequently overlapping. Abdominopelvic pain was the most common complaint, reported by 62.3% of patients, followed closely by abdominal distension in 49.1%(*Table 1*).

Table I
Presenting clinical symptoms (*n*=53).

Symptom	n	%
Abdominopelvic pain	33	62.3
Abdominal distension	26	49.1
Menstrual irregularities	15	28.3
Palpable abdominal mass	11	20.8
Gastrointestinal symptoms	10	18.9
Urinary frequency	8	15.1

Multiple symptoms were present in individual patients; hence, percentages do not sum to 100%.

Menstrual irregularities were noted in 28.3% of the cohort, while gastrointestinal symptoms (such as nausea, constipation, or loss of appetite) and urinary frequency were present in 18.9% and 15.1%, respectively (Fig-2).

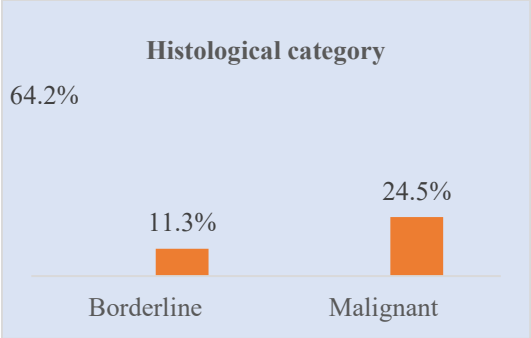

Figure 2: Overall histopathological classification of ovarian tumors (*n*=53).

A palpable abdominal mass was documented on clinical examination in 20.8% of cases. The median duration of symptoms prior to presentation was 4.5 months (interquartile range: 2.0-8.0 months). Histopathological examination revealed that benign tumors constituted the largest group, accounting for 64.2% of all ovarian neoplasms. Borderline (low malignant potential) tumors represented 11.3%, while malignant tumors comprised 24.5% of the cohort. Among the benign lesions, mature cystic teratoma was the most frequent subtype (35.3%), followed by serous cystadenoma (29.4%) and mucinous cystadenoma (23.5%). In the malignant group, serous cystadenocarcinoma was the predominant histotype, observed in 46.2% of cases, with mucinous cystadenocarcinoma accounting for 30.8%. Endometrioid and clear cell carcinomas constituted 15.4% and 7.7%, respectively (*Table II*).

Table 2
Distribution of histological subtypes among benign, borderline, and malignant tumors.

Category	Subtype	n
Benign (n=34)	Mature cystic teratoma	12
	Serous cystadenoma	10
	Mucinous cystadenoma	8
	Others (fibroma, thecoma)	4
Borderline (n=6)	Serous borderline tumor	3
	Mucinous borderline tumor	3
Malignant (n=13)	Serous cystadenocarcinoma	6
	Mucinous cystadenocarcinoma	4
	Endometrioid carcinoma	2
	Clear cell carcinoma	1

Among the six borderline tumors, three were of serous type and three of mucinous type. When the histopathological category was analyzed against demographic variables, a statistically significant association emerged between advancing age and malignant/borderline disease. Specifically, the proportion of borderline and malignant tumors progressively increased from 30.4% in women younger than 40 years to 40.0% in the 40-49 year's group, and further to 60.0% among those aged 50 years and above (p=0.047) (*Table III*).

Table III
Association of histological category with age group and menopausal status.

Variable	Benign (n=34) n (%)	Borderline/Malignant (n=19) n (%)	p-value
Age group (years)			
< 40 yrs.	16 (69.6)	7 (30.4)	0.047
40 - 49 yrs.	14 (60.0)	6 (40.0)	
≥ 50 yrs.	4 (40.0)	6 (60.0)	
Menopausal status			
Premenopausal	24 (75.0)	8 (25.0)	0.023
Postmenopausal	10 (47.6)	11 (52.4)	

Chi-square test was applied to compare proportions across groups.
Similarly, menopausal status exhibited a strong correlation with tumor type: while only 25.0% of premenopausal women harbored borderline or malignant neoplasms, the corresponding proportion rose to 52.4% in postmenopausal women (p=0.023). The preoperative Risk of Malignancy Index (RMI) demonstrated a robust graded association with the final histological outcome. Among patients classified as low risk (RMI <200), only 10.0% were ultimately diagnosed with borderline or malignant tumors. In contrast, the intermediate-risk group (RMI 200–500) showed a malignancy/borderline rate of 44.4%, while the high-risk category (RMI >500) exhibited a striking 60.0% prevalence of borderline or malignant disease (p<0.001). These findings underscore the discriminative utility of the RMI in preoperative risk stratification within our cohort (*Table IV*).

Table IV
Association of Risk of Malignancy Index (RMI) with final histological category

RMI category	Benign (n=34) n (%)	Borderline/Malignant (n=19) n (%)	p-value
Low risk (< 200)	18 (90.0)	2 (10.0)	< 0.001
Intermediate risk (200 - 500)	10 (55.6)	8 (44.4)	
High risk (> 500)	6 (40.0)	9 (60.0)	

Chi-square test for linear trend was applied to assess the graded association across RMI categories.

DISCUSSION

The present study provides a contemporary prospective evaluation of the clinical and histopathological profile of ovarian tumors among women presenting to a tertiary care hospital. Our findings reveal that benign tumors constituted the majority (64.2%) of ovarian neoplasms, while malignant tumors accounted for nearly one-quarter of cases (24.5%), and borderline tumors comprised 11.3%. This distribution is broadly consistent with several previous reports from the region. In a histomorphological study conducted at a tertiary-level hospital in the country, benign tumors represented 69.0%, malignant tumors 30.0%, and borderline tumors only 1.0% [14]. Another institutional series reported a higher proportion of malignant tumors (55.6%) compared with benign lesions (44.4%), though this discrepancy may be attributable to differences in study design and patient selection criteria [15]. In a retrospective national-level review of epithelial ovarian cancer, all cases were malignant by definition, with a median age of 45 years and papillary serous cystadenocarcinoma as the predominant histotype (76.3%) [16]. The predominance of benign tumors observed in our cohort aligns with the well-established pattern that benign ovarian neoplasms are more frequently encountered in general gynecological practice, whereas malignant tumors, though less common, carry disproportionately greater clinical significance. The age distribution in our study demonstrated a peak incidence in the 41-50 year's age group (37.7%), with a mean age of 42.3±12.7 years. This finding is comparable to that reported in a prior local study, which observed a mean age of 36.3±12.7 years with the majority of patients in the 31-40 year's bracket [14]. In contrast, a regional study reported that benign tumors peaked between 20 and 45 years, whereas malignant tumors were more common after 45 years [17]. Similarly, in a retrospective clinicopathological study of malignant ovarian tumors from a tertiary health care center, the mean age was 47.44±14.24 years [18]. The association between advancing age and increased risk of malignancy observed in our study-with the proportion of borderline and malignant tumors rising from 30.4% in women under 40 years to 60.0% in those aged 50 years and above (p=0.047)-corroborates the well-recognized epidemiological pattern that ovarian malignancy predominantly affects perimenopausal and postmenopausal women [19]. Menopausal status emerged as a significant determinant of tumor type in our cohort. Postmenopausal women had a substantially higher prevalence of borderline or malignant tumors (52.4%) compared with premenopausal women (25.0%), with a p-value of 0.023. This finding is in agreement with previous literature demonstrating that postmenopausal status is consistently associated with an elevated risk of epithelial ovarian malignancies [3]. In another institutional series, postmenopausal status was the most frequent finding (52%) among the malignant tumor group [15]. The biological basis for this association likely involves cumulative exposure to gonadotropins, declining ovarian function, and age-related accumulation of genetic alterations in ovarian surface epithelial cells. The histopathological subtype distribution in our study revealed that among benign tumors, mature cystic teratoma was the most common (35.3%), followed by serous cystadenoma (29.4%) and mucinous cystadenoma (23.5%). Among malignant tumors, serous cystadenocarcinoma was the predominant subtype (46.2%), with mucinous cystadenocarcinoma accounting for 30.8%. This predominance of serous histology is consistent with multiple studies from the region. One large retrospective review reported that serous adenocarcinoma was the commonest malignant histotype (50.4%), with endometrioid variety being the least common (0.8%) [20]. Similarly, another investigation found that among epithelial ovarian carcinomas, serous carcinoma was predominant (82.0%), followed by mucinous (8.0%) and endometrioid carcinoma (2.0%) [19]. A further retrospective review of epithelial ovarian cancer patients reported papillary serous cystadenocarcinoma as the most common histological type (76.3%) in their cohort [16]. The relatively higher proportion of mucinous carcinomas in our study (30.8%) compared with these reports may reflect differences in the underlying population, referral patterns, or the inclusion of both early- and late-stage cases. Clinically, abdominopelvic pain (62.3%) and abdominal distension (49.1%) were the most frequent presenting complaints in our cohort. This symptom profile mirrors that reported in other local studies, where abdominal discomfort and occasional pain predominated [14]. Other reviews have similarly identified abdominal distention followed by abdominal pain as the main presenting complaints [20]. In another hospital-based series, abdominal pain was the predominant complaint (73.3%), followed by abdominal lump (62%) [15]. The nonspecific nature of these symptoms, coupled with their overlap with common gastrointestinal conditions, contributes substantially to diagnostic delays. Indeed, it has been observed that up to 93% of women with ovarian cancer report such symptoms for months before diagnosis [4]. The median duration of symptoms before presentation in our study was 4.5 months (IQR: 2.0-8.0 months), highlighting a critical window for earlier detection that remains largely unaddressed in resource-constrained settings. The Risk of Malignancy Index (RMI) demonstrated a strong graded association with final histological outcome in our study. The proportion of borderline or malignant tumors increased progressively from 10.0% in the low-risk category (RMI <200) to 44.4% in the intermediate-risk group (RMI 200-500) and 60.0% in the high-risk category (RMI >500), with a highly significant p-value of <0.001. This finding validates the clinical utility of the RMI as a simple, cost-effective preoperative triage tool in our setting. Previous studies have consistently supported the RMI's diagnostic accuracy. A systematic review and meta-analysis reported that RMI version 1 with a cut-off of 200 had a sensitivity of 69.7% and specificity of 90.5% [21]. Another validation study demonstrated that an RMI cut-off of 100 achieved a sensitivity of 95.0% and specificity of 92.0% [22]. A head-to-head comparison of RMI and ADNEX models confirmed that RMI provides reliable risk estimation for ovarian masses based on clinical and ultrasound information [23]. In the local context, a validation study has similarly shown that RMI effectively differentiates benign from malignant ovarian tumors, with 89.5% of benign cases having RMI <200 and 86.4% of malignant cases having RMI ≥200 [24]. Our results reinforce the recommendation that RMI should be incorporated into routine preoperative evaluation protocols in tertiary care hospitals to optimize referral pathways and reduce unnecessary extensive surgery for benign lesions.

LIMITATIONS

The relatively modest sample size, the inherent selection bias of purposive sampling, the single-center design, the absence of comprehensive FIGO staging, and the lack of long-term follow-up data collectively limit the generalizability of our observations and preclude any meaningful assessment of survival or recurrence patterns.

CONCLUSION

This prospective study demonstrates that benign ovarian tumors predominate in our cohort, although a substantial proportion of malignant lesions, predominantly serous cystadenocarcinoma, affect perimenopausal women who typically present with vague, non-specific abdominal symptoms. The significant association of malignancy with advancing age and postmenopausal status, together with the excellent discriminatory performance of the Risk of Malignancy Index, strongly reinforces the clinical imperative for systematic preoperative risk stratification and sustained heightened diagnostic vigilance in Bangladesh.

RECOMMENDATION

Future multicenter studies with larger, representative cohorts and extended longitudinal follow-up are essential to validate our observations. Concurrently, integrating the RMI into routine preoperative evaluation and launching targeted public awareness campaigns on early ovarian symptoms should be prioritized at the national level.

CONFLICT OF INTEREST

The authors declare no conflicts of interest. No funding was received for this study. The corresponding author had full access to all data and final responsibility for the decision to submit for publication.

AI DECLARATION

Artificial intelligence tools contributed marginally to manuscript preparation and development. All core scientific content was human-verified.

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