

Patterns of Referral and Diagnostic Delay among Women with Newly Diagnosed Gynaecological Malignancies in a Tertiary Care Hospital: A Prospective Observational Study

Dr. Fatema Tasnim Jahan Jhumly^{1*}, Dr. Afroza Sultana², Dr. Prianka Haldar³, Dr. Most. Rokshana Rahat⁴, Dr. Mahabuba Shaki⁵, Dr. Sadia Taskeen⁶

¹Assistant Professor, Department of Obstetrics and Gynaecology, Shaheed Suhrawardy Medical College and Hospital, Dhaka, Bangladesh

²Assistant Professor, Department of Obstetrics and Gynaecology, Mymensingh Medical College, Mymensingh, Bangladesh

³Assistant Professor, Department of Obstetrics and Gynaecology, Sher-E-Bangla Medical College Hospital, Barishal, Bangladesh

⁴Assistant Professor, Department of Obstetrics and Gynaecology, Shaheed Suhrawardy Medical College and Hospital, Dhaka, Bangladesh

⁵Assistant Professor, Department of Obstetrics and Gynaecology, Sher-E-Bangla Medical College Hospital, Barishal, Bangladesh

⁶Assistant Professor, Department of Obstetrics and Gynaecology, TMSS Medical College and Rafatullah Community Hospital (TMC & RCH), Bogura, Bangladesh

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*Corresponding author: Dr. Fatema Tasnim Jahan Jhumly

Assistant Professor, Department of Obstetrics and Gynaecology, Shaheed Suhrawardy Medical College and Hospital, Dhaka, Bangladesh

Abstract

Background: Diagnostic delay is an important barrier to timely management of gynaecological malignancies and may result from patient-, provider-, and health-system-related factors. Identifying referral patterns and stages of delay may help improve timely diagnosis. **Objective:** To assess the patterns of referral and diagnostic delay among women with newly diagnosed gynaecological malignancies attending a tertiary care hospital. **Methods:** This prospective observational study was conducted from January 2026 to June 2026 among 150 women with newly diagnosed, histopathologically confirmed gynaecological malignancies attending the Department of Gynaecological Oncology, National Institute of Cancer Research & Hospital, Dhaka. Sociodemographic characteristics, presenting symptoms, initial healthcare contact, referral source, number of healthcare visits, diagnostic investigations, and reasons for delay were recorded. Diagnostic intervals were assessed from symptom onset to first healthcare contact, referral, specialist consultation, and histopathological confirmation. **Results:** The mean age of participants was 48.5 ± 13.8 years. Cervical cancer was the most common malignancy (52.0%), followed by ovarian (21.3%) and endometrial cancer (16.0%). Private clinics/hospitals were the most common initial healthcare facility (32.0%), while government hospitals were the leading referral source (31.3%). The mean overall diagnostic interval was 95.6 ± 48.3 days, and 39.3% of participants had an interval exceeding 90 days. Lack of awareness (36.0%), financial constraints (31.3%), delayed referral (27.3%), and repeated consultations (25.3%) were the major reported contributors to delay. **Conclusion:** A considerable diagnostic interval was observed, with delays occurring at multiple stages of the healthcare pathway. Strengthening awareness, referral systems, and timely diagnostic services may facilitate earlier diagnosis.

Keywords: Gynaecological malignancy; Diagnostic delay; Referral pattern; Cancer diagnosis; Tertiary care; Histopathology.

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INTRODUCTION

Gynaecological malignancies, including cancers of the cervix, ovary, endometrium, vulva, and vagina, remain an important cause of cancer-related

morbidity and mortality among women. The global cancer burden continues to increase, with an estimated 20.6 million new cancer cases and 9.8 million cancer deaths worldwide in 2024. Among cancers affecting

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women, cervical cancer remains a major public health concern, particularly in low- and middle-income countries (LMICs), where inequalities in prevention, early detection, diagnostic services, and access to specialist care may adversely influence outcomes. [1,2]

Timely diagnosis is an essential component of effective cancer control because the diagnostic pathway determines how quickly women with potentially malignant symptoms receive appropriate specialist assessment and definitive investigation. Diagnostic delay may occur at several stages, including delay in recognizing symptoms and seeking care, delay in initial clinical assessment, delay in referral to appropriate specialists, and delay in completing diagnostic investigations. A systematic review of delayed cervical cancer diagnosis demonstrated considerable variation in the duration of diagnostic delay and identified patient-related, medical, and health-system factors as important contributors. The review also found that delayed diagnosis was frequently associated with advanced-stage disease. [3]

The first stage of delay often begins before a woman reaches specialist care. Women may not immediately seek medical attention because of limited knowledge of cancer-related symptoms, embarrassment, fear, competing responsibilities, previous healthcare experiences, or practical constraints such as time and financial resources. A systematic review specifically examining help-seeking behaviour among women subsequently diagnosed with gynaecological cancer identified three major groups of factors: patient factors, emotional factors, and practical factors. Knowledge of symptoms, embarrassment, trust in healthcare, availability of time, and resources were among the factors influencing whether women sought medical attention promptly. [4]

Delays may also develop during the primary-care and referral process. Gynaecological malignancies do not always present with highly specific symptoms, and complaints such as abdominal pain, bloating, abnormal vaginal bleeding, pelvic discomfort, urinary symptoms, or menstrual abnormalities may initially be attributed to benign conditions. In ovarian cancer, for example, a population-based study demonstrated that women presenting with nonspecific symptoms were less likely to be referred through an accelerated cancer pathway and experienced longer diagnostic intervals. [5] Similarly, a recent study of women with advanced ovarian cancer found that the median interval from first physician consultation to reasonable suspicion of cancer was 24 days, while initial consultation in specialized care was associated with a substantially shorter interval than consultation in primary care. [6]

The nature and efficiency of the referral pathway therefore have important implications for diagnostic timeliness. A multi-institutional study of

referrals to gynecologic oncology services found a median interval of 15 days between the first healthcare evaluation and specialist referral. The study also identified differences according to referring specialty, geographic distance, insurance status, and the setting in which the woman was initially evaluated, demonstrating that referral pathways can introduce measurable delays before specialist assessment. [7] More recent evidence among women receiving gynecologic oncology care has similarly shown that inefficient referral patterns may contribute to cumulative delays before specialist consultation. [8]

Delays are not restricted to referral alone; difficulties in accessing appropriate diagnostic services may further prolong the pathway. In endometrial cancer, women without established primary-care or obstetric-gynaecological care were more likely to experience significant delays from symptom onset to treatment and were more likely to have extrauterine disease. [9] Diagnostic procedures themselves may also contribute to prolonged intervals. Among women referred for postmenopausal bleeding, a study reported a mean interval of 83 days between initial consultation and final cancer diagnosis, with difficulties and inadequate samples during endometrial assessment contributing to repeated diagnostic procedures. [10]

The problem is particularly relevant in LMICs, where health-system capacity and availability of diagnostic services may vary substantially between levels of care. Evidence from Bangladesh indicates important differences in cervical cancer service readiness across healthcare levels. A national assessment of 323 health facilities found that tertiary and specialized hospitals generally had adequate staffing, equipment, and diagnostic capacity, whereas readiness was considerably lower at many primary and secondary facilities. [11] A separate assessment of primary healthcare facilities in Bangladesh also identified deficiencies in trained staff, diagnostic facilities, guidelines, and essential resources for cervical cancer management. [12] These gaps may influence the pathway through which women move from initial healthcare contact to specialist diagnostic services.

The consequences of delayed recognition and referral may be particularly important for cervical cancer in Bangladesh. A tertiary-level observational study from Bangladesh reported that a substantial proportion of women with cervical cancer presented at advanced stages, highlighting the continuing challenge of timely diagnosis in routine clinical practice. [13] Low awareness and inadequate understanding of cervical cancer screening have also been identified as important barriers to preventive and early-detection practices among Bangladeshi women. [14] These findings suggest that diagnostic delay should be considered not only as an individual patient problem but also as a consequence of interactions between patients, healthcare providers,

referral systems, and diagnostic infrastructure.

Recent international evidence further emphasizes the importance of examining the diagnostic pathway rather than considering diagnosis as a single event. Studies of gynecological oncology referral patterns and emergency diagnostic pathways have demonstrated that the route through which women enter specialist services can influence the timing of diagnosis and subsequent care. [7,15] Therefore, identifying where delays occur and characterizing the pathways by which newly diagnosed women reach tertiary care may help reveal potentially modifiable barriers.

Despite the clinical importance of timely diagnosis, there remains limited prospective evidence describing referral patterns and diagnostic delay across different types of gynaecological malignancies in tertiary-care settings in Bangladesh. A prospective assessment can provide direct information on the source of referral, number and type of prior healthcare contacts, intervals between symptom onset and presentation, referral and specialist assessment, diagnostic investigation, and final confirmation of malignancy. Such information may help identify avoidable delays and provide evidence for strengthening referral coordination and early diagnostic pathways.

Therefore, the present study was undertaken to assess the patterns of referral and diagnostic delay among women with newly diagnosed gynaecological malignancies in a tertiary care hospital, with particular emphasis on the pathways through which women reach specialist care and the factors contributing to delays in establishing a definitive diagnosis.

OBJECTIVES

The main objective was to assess the patterns of referral and diagnostic delay among women with newly diagnosed gynaecological malignancies attending a tertiary care hospital.

METHODOLOGY & MATERIALS

The prospective observational study was conducted in the Department of Gynaecological Oncology, National Institute of Cancer Research & Hospital (NICRH), Mohakhali, Dhaka, Bangladesh. The study was carried out over the specified study period. The study was carried out over twelve months from January 2026 to June 2026.

Inclusion Criteria:

- Women aged ≥ 18 years
- Women with newly diagnosed gynaecological malignancies
- Women with histopathologically confirmed gynaecological malignancy

- Women who attended or were referred to the Department of Gynaecological Oncology, NICRH
- Women who provided informed written consent to participate in the study

Exclusion Criteria:

- Women with a previous history of treatment for gynaecological malignancy
- Women with recurrent or previously treated malignancy
- Women with incomplete clinical or diagnostic records
- Women who were unwilling to participate in the study

A total of 150 women with newly diagnosed gynaecological malignancies were enrolled purposively during the study period. Relevant demographic, clinical, referral, and diagnostic information was collected using a structured data collection sheet. Baseline demographic variables, including age, residence, educational status, socioeconomic characteristics, and relevant reproductive and medical history, were recorded. Clinical information included presenting symptoms, duration of symptoms before seeking healthcare, initial healthcare contact, previous consultations, and the healthcare facility initially attended.

Details regarding the referral pathway were documented, including the source of referral, level and type of referring healthcare facility, number of healthcare visits before reaching the tertiary care hospital, and the interval between initial healthcare contact and referral to the Department of Gynaecological Oncology. The dates of relevant clinical encounters and diagnostic procedures were recorded from patient interviews, referral documents, and medical records.

Diagnostic delay was assessed by documenting the interval between onset of symptoms and first healthcare contact, first healthcare contact and referral, referral and specialist consultation, and specialist consultation and definitive diagnosis. The overall diagnostic interval was calculated from the onset of symptoms to histopathological confirmation of malignancy. Possible reasons for delay, including lack of awareness, financial difficulties, transportation problems, fear or reluctance to seek care, repeated consultation, misdiagnosis, delayed referral, and delay in diagnostic investigations, were also documented where applicable.

Information regarding the type of gynaecological malignancy and histopathological diagnosis was recorded. Relevant diagnostic investigations, including ultrasonography, radiological imaging, cytological examination, biopsy, and histopathological examination, were documented

according to the clinical requirements of individual patients.

All collected information was checked for completeness and consistency before analysis. Ethical approval was obtained from the appropriate Institutional Review Board/Ethical Review Committee of the National Institute of Cancer Research & Hospital (NICRH), Dhaka. Informed written consent was obtained from all participants before enrolment. Confidentiality of patient information was strictly maintained, and the collected data were used solely for research purposes.

Statistical Analysis:

All data were recorded systematically in a pre-formed data collection form and entered into a computer for analysis. Quantitative data were expressed as mean $\pm$ standard deviation (SD) or median with interquartile range, as appropriate, while qualitative data were expressed as frequency and percentage. Statistical

analysis was carried out using SPSS (Statistical Package for the Social Sciences) software. Appropriate statistical tests were used to determine the association between referral patterns, diagnostic intervals, and relevant demographic and clinical factors. A p-value of less than 0.05 was considered statistically significant. Confidentiality of the collected information was strictly maintained throughout the study.

RESULT

Table I shows the sociodemographic characteristics of the 150 study participants. The mean age was 48.5 ± 13.8 years. The largest proportion belonged to the 51–60 years age group (28.0%), followed by 41–50 years (26.0%). Most participants were from urban areas (54.7%). Regarding educational status, primary education was the most common level (28.0%), followed by no formal education (25.3%) and secondary education (23.3%).

Table I: Sociodemographic characteristics of the study participants (n=150)

Sociodemographic characteristics of the study participants		
Characteristics	Frequency (n)	Percentage (%)
Age group (years)		
18–30	12	8
31–40	24	16
41–50	39	26
51–60	42	28
>60	33	22
Mean ± SD	48.5 ± 13.8	
Residence		
Urban	82	54.7
Rural	68	45.3
Educational status		
No formal education	38	25.3
Primary	42	28
Secondary	35	23.3
Higher secondary	20	13.3
Graduate and above	15	10
Total	150	100

Table II demonstrates the distribution of participants according to the type of gynaecological malignancy. Cervical cancer was the most common malignancy (52.0%), followed by ovarian cancer

(21.3%) and endometrial cancer (16.0%). Vulvar and vaginal cancers accounted for 5.3% and 3.3%, respectively, while other gynaecological malignancies comprised 2.0% of cases.

Table II: Distribution of participants according to type of gynaecological malignancy (n=150)

Type of malignancy	Frequency (n)	Percentage (%)
Cervical cancer	78	52
Ovarian cancer	32	21.3
Endometrial cancer	24	16
Vulvar cancer	8	5.3
Vaginal cancer	5	3.3
Other gynaecological malignancies	3	2
Total	150	100

Table III presents the symptoms reported before the first healthcare contact. Abnormal vaginal bleeding

was the most frequently reported symptom (48.0%), followed by lower abdominal or pelvic pain (38.0%) and

abnormal vaginal discharge (32.0%). Postmenopausal bleeding was reported by 20.7% of participants, while

abdominal distension or bloating and weight loss were reported by 19.3% and 17.3%, respectively.

Table III: Presenting symptoms before first healthcare contact (n=150)

Presenting symptom	Frequency(n)	Percentage(%)
Abnormal vaginal bleeding	72	48
Postmenopausal bleeding	31	20.7
Abnormal vaginal discharge	48	32
Lower abdominal/pelvic pain	57	38
Abdominal distension/bloating	29	19.3
Pelvic mass	18	12
Urinary symptoms	16	10.7
Gastrointestinal symptoms	13	8.7
Weight loss	26	17.3

Figure 1 shows the duration of symptoms before the first healthcare contact. The largest proportion of participants reported symptoms for more than 1 to 3 months (34.0%), followed by more than 3 to 6 months

(26.0%). Symptoms had been present for ≤ 1 month in 23.3% of participants, whereas 16.7% reported symptoms for more than 6 months.

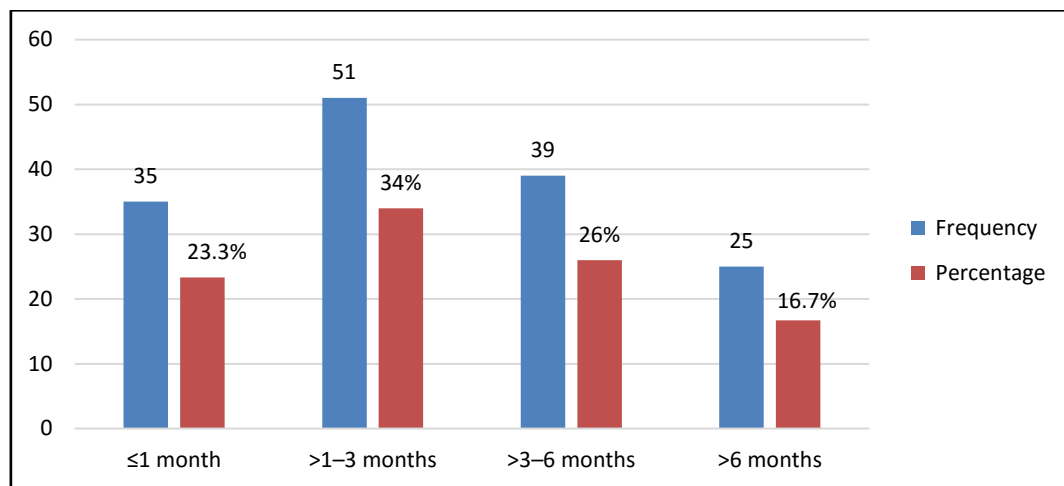


Figure 1: Duration of symptoms before first healthcare contact

Table IV demonstrates the initial healthcare contact and referral pathways. A private clinic or hospital was the most common first healthcare facility attended (32.0%), followed by a secondary hospital (22.7%) and medical college hospital (18.7%). Regarding referral to

NICRH, government hospitals accounted for the largest proportion of referrals (31.3%), followed by private hospitals or clinics (26.0%) and medical college hospitals (20.7%). Self-referral was observed in 12.7% of participants.

Table IV: Initial healthcare contact and referral pathway among the study participants (n=150)

Referral-related variable	Frequency (n)	Percentage (%)
First healthcare facility attended		
Primary healthcare facility	25	16.7
Secondary hospital	34	22.7
Private clinic/hospital	48	32
Medical college hospital	28	18.7
Other	15	10
Source of referral to NICRH		
Government hospital	47	31.3
Private hospital/clinic	39	26
Medical college hospital	31	20.7
Primary healthcare facility	14	9.3
Self-referred	19	12.7

Table V shows the number of healthcare visits made before reaching NICRH. Nearly one-third of participants had two previous healthcare visits (31.3%),

while 26.0% had three visits. One visit and four or more visits were reported by 21.3% of participants each.

Table V: Number of healthcare visits before reaching NICRH (n=150)

Visits	Frequency (n)	Percentage (%)
1	32	21.3
2	47	31.3
3	39	26
≥4	32	21.3
Total	150	100

Table VI presents the diagnostic investigations performed during the diagnostic work-up. Biopsy and histopathological examination were performed in all participants (100.0%). Ultrasonography was performed

in 84.0%, followed by CT scan in 46.0%, cytology/Pap smear in 36.0%, X-ray in 34.7%, colposcopy in 30.0%, and MRI in 27.3%.

Table VI: Diagnostic investigations performed during the diagnostic work-up (n=150)

Diagnostic investigation	Frequency (n)	Percentage (%)
Ultrasonography	126	84
CT scan	69	46
MRI	41	27.3
X-ray	52	34.7
Cytology/Pap smear	54	36
Colposcopy	45	30
Biopsy	150	100
Histopathology	150	100

Table VII shows the diagnostic intervals at different stages of the care pathway. The mean interval from symptom onset to first healthcare contact was 38.6 ± 31.4 days, while the mean interval from first healthcare contact to referral was 24.8 ± 22.7 days. The mean

referral-to-specialist consultation interval was 13.5 ± 12.1 days, and the specialist consultation-to-definitive diagnosis interval was 18.7 ± 15.6 days. The overall mean diagnostic interval was 95.6 ± 48.3 days.

Table VII: Diagnostic intervals among the study participants (n=150)

Diagnostic interval	Mean $\pm$ SD (days)	Median (IQR), days	Range, days
Symptom onset $\rightarrow$ first healthcare contact	38.6 ± 31.4	30 (15–50)	3–180
First healthcare contact $\rightarrow$ referral	24.8 ± 22.7	18 (8–32)	1–120
Referral $\rightarrow$ specialist consultation	13.5 ± 12.1	10 (5–18)	1–75
Specialist consultation $\rightarrow$ definitive diagnosis	18.7 ± 15.6	14 (7–23)	2–90
Overall diagnostic interval	95.6 ± 48.3	82 (60–115)	15–365

Table VIII demonstrates the distribution of participants according to the overall diagnostic interval. The largest proportion had an interval of more than 90 days (39.3%), followed by 61–90 days (26.0%).

Diagnostic intervals of 31–60 days and ≤ 30 days were observed in 22.7% and 12.0% of participants, respectively.

Table VIII: Distribution of participants according to overall diagnostic delay (n=150)

Overall diagnostic interval	Frequency (n)	Percentage (%)
≤ 30 days	18	12
31–60 days	34	22.7
61–90 days	39	26
>90 days	59	39.3
Total	150	100

Table IX presents the reported reasons for diagnostic or referral delay. Lack of awareness was the most frequently reported reason (36.0%), followed by

financial constraints (31.3%) and delayed referral (27.3%). Repeated consultation was reported by 25.3% of participants, while delay in diagnostic investigations,

fear of cancer, and waiting for investigation reports were reported by 23.3%, 20.7%, and 18.7%, respectively

Table IX: Reported reasons for delay in diagnosis or referral (n=150)

Reason for delay	Frequency (n)	Percentage (%)
Lack of awareness	54	36
Financial constraints	47	31.3
Fear of cancer	31	20.7
Transportation difficulties	26	17.3
Reluctance/embarrassment	22	14.7
Repeated consultation	38	25.3
Initial misdiagnosis	29	19.3
Delayed referral	41	27.3
Delay in diagnostic investigations	35	23.3
Waiting for investigation/report	28	18.7

DISCUSSION

The present prospective observational study evaluated patterns of referral and diagnostic delay among 150 women with newly diagnosed gynaecological malignancies attending the Department of Gynaecological Oncology, National Institute of Cancer Research & Hospital (NICRH), Dhaka. The mean overall diagnostic interval, defined as the period from symptom onset to histopathological confirmation, was 95.6 ± 48.3 days, with 39.3% of women having an interval of more than 90 days. The principal reported contributors to delay were lack of awareness, financial constraints, delayed referral, repeated healthcare consultations, and delays in diagnostic investigations. These findings support the concept that diagnostic delay in gynaecological cancer is multifactorial, involving patient-related, healthcare-provider, and health-system factors. Similar patterns have been described in systematic reviews of gynaecological cancer diagnostic pathways. [16,17]

In the present study, the mean age of the participants was 48.5 ± 13.8 years, with the largest proportion belonging to the 51–60-year age group (28.0%), followed by 41–50 years (26.0%) and women aged above 60 years (22.0%). More than half of the participants (54.7%) were from urban areas. The predominance of women in middle and older age groups is consistent with the age distribution generally observed among women presenting with gynaecological malignancies. Age may also influence the diagnostic pathway because older women may have multiple symptoms or comorbidities that complicate recognition of malignancy. In a study of women with advanced ovarian cancer, age and referral route were found to influence access to diagnosis, highlighting the importance of healthcare pathway characteristics in addition to patient age. [6]

The relatively high proportion of urban participants in the present study may reflect the location of NICRH as a national tertiary cancer referral centre in Dhaka. However, urban residence does not necessarily

eliminate barriers to timely diagnosis. Financial limitations, healthcare-seeking behaviour, previous consultations, and availability of appropriate diagnostic services may continue to influence the diagnostic journey. Evidence from low- and middle-income countries indicates that socioeconomic and health-system barriers can substantially contribute to delays in cancer diagnosis. [17]

Cervical cancer was the most frequent malignancy in the present study, accounting for 52.0% of cases, followed by ovarian cancer (21.3%) and endometrial cancer (16.0%). Vulvar, vaginal, and other gynaecological malignancies represented smaller proportions. The predominance of cervical cancer is consistent with the substantial burden of cervical malignancy reported in Bangladesh and other low- and middle-income settings. Studies from Bangladesh have also demonstrated considerable delays in the diagnosis and treatment of cervical cancer, with patient-level and health-system factors contributing to delayed care. [18,19]

The high proportion of cervical cancer in the present study is clinically important because cervical cancer is potentially detectable at earlier stages through screening and appropriate evaluation of suspicious symptoms. A systematic review of delayed cervical cancer diagnosis identified patient-related factors, medical-history-related factors, and health-system factors as major contributors to diagnostic delay. [3] Therefore, the observed predominance of cervical cancer in a tertiary oncology referral setting may also reflect delayed presentation and referral of symptomatic women.

Abnormal vaginal bleeding was the most frequently reported symptom before the first healthcare contact (48.0%), followed by lower abdominal or pelvic pain (38.0%), abnormal vaginal discharge (32.0%), and postmenopausal bleeding (20.7%). Abdominal distension or bloating, weight loss, pelvic mass, urinary

symptoms, and gastrointestinal symptoms were also reported.

The predominance of abnormal vaginal bleeding in the present study is clinically relevant because abnormal bleeding is an important warning symptom of several gynaecological malignancies. However, the presence of less specific symptoms such as pelvic pain, abdominal distension, and gastrointestinal complaints may complicate early recognition, particularly in ovarian malignancy. A primary-care study of ovarian cancer found abdominal pain and abdominal distension among the common presenting symptoms and demonstrated considerable variation in diagnostic pathways. [20] Similarly, primary-care guidance emphasizes that abdominal pain, abdominal distension, and other nonspecific symptoms may be associated with malignancy but can easily be attributed to benign conditions. [21]

In the present study, 34.0% of women had symptoms for more than 1–3 months before their first healthcare contact, while 26.0% had symptoms for more than 3–6 months and 16.7% had symptoms for more than six months. Thus, a considerable proportion of women experienced symptoms for several months before entering the healthcare system. This finding is consistent with evidence that patient knowledge, interpretation of symptoms, beliefs, and social circumstances may contribute to delays in seeking medical care. [3,16,17]

The first healthcare contact was most frequently a private clinic or hospital (32.0%), followed by a secondary hospital (22.7%), medical college hospital (18.7%), and primary healthcare facility (16.7%). Regarding referral to NICRH, government hospitals constituted the largest referral source (31.3%), followed by private hospitals or clinics (26.0%) and medical college hospitals (20.7%). A smaller proportion was referred from primary healthcare facilities (9.3%), whereas 12.7% were self-referred.

These findings demonstrate that women with newly diagnosed gynaecological malignancies reach a tertiary cancer centre through multiple and sometimes complex healthcare pathways. Referral route may influence the number of consultations and the time required before specialist assessment. A recent multi-institutional study of referral patterns for gynecologic oncology consultation emphasized that referral practices vary across healthcare settings and that access to specialist gynecologic oncology assessment is an important component of cancer care. [7]

The substantial proportion of women initially attending private facilities may reflect the pluralistic healthcare system in Bangladesh, where patients frequently seek care from multiple sectors before reaching a specialized government cancer centre. The coexistence of government, private, primary, secondary,

and tertiary pathways may create opportunities for repeated assessment and referral-related delay. Previous research has similarly identified referral processes and access to investigations as important components of the diagnostic pathway. [16,17]

In the present study, 31.3% of women had two healthcare visits before reaching NICRH, 26.0% had three visits, and 21.3% required four or more visits. Thus, more than one-fifth of the participants required at least four healthcare visits before reaching the tertiary oncology centre.

Repeated healthcare contacts may indicate difficulties in recognizing suspicious symptoms, obtaining appropriate investigations, or initiating timely specialist referral. In ovarian cancer, repeated primary-care consultations have been reported as part of the prediagnostic pathway, particularly when symptoms are nonspecific [20]. Similarly, evidence from gynaecological cancer research indicates that delays may arise from both patient and primary-care factors, including symptom recognition, investigation, and referral processes. [16]

The present findings therefore suggest that the number of healthcare contacts should not be considered merely a measure of healthcare utilization; repeated visits may represent missed opportunities for earlier investigation or referral. Strengthening clinical suspicion and improving referral criteria at the primary and secondary levels may reduce unnecessary repetition of consultations.

Ultrasonography was the most commonly reported imaging investigation, performed in 84.0% of participants, followed by CT scan (46.0%), X-ray (34.7%), MRI (27.3%), cytology/Pap smear (36.0%), and colposcopy (30.0%). Tissue sampling and histopathological examination were recorded in all participants because histopathological confirmation was an inclusion criterion of the present study.

The range of investigations reflects the heterogeneous nature of gynaecological malignancies and the need for different diagnostic approaches according to tumour site and clinical presentation. However, multiple investigations performed sequentially may prolong the diagnostic pathway when access to appropriate tests is delayed or when an initial investigation is inconclusive. In women with postmenopausal bleeding, diagnostic delay has been associated with difficulties and repeated procedures during the diagnostic work-up. [10]

Recent evidence indicates that the diagnostic interval is influenced not only by patient presentation but also by access to investigations and the organization of healthcare services [16,17]. Therefore, improving availability and coordination of appropriate diagnostic

investigations may contribute to shortening the time from specialist assessment to definitive diagnosis.

The mean interval from symptom onset to first healthcare contact was 38.6 ± 31.4 days, while the interval from first healthcare contact to referral was 24.8 ± 22.7 days. The mean referral-to-specialist consultation interval was 13.5 ± 12.1 days, and the mean interval from specialist consultation to definitive diagnosis was 18.7 ± 15.6 days. Consequently, the mean overall diagnostic interval from symptom onset to histopathological confirmation was 95.6 ± 48.3 days.

These findings demonstrate that delay accumulated across several stages rather than being concentrated at a single point in the diagnostic pathway. This interpretation is consistent with the established concept that cancer diagnosis comprises sequential patient, primary-care, referral, diagnostic, and specialist intervals. [16,22]

A recent study of breast and gynaecological cancers similarly demonstrated that the total diagnostic pathway is composed of several intervals and found that the diagnostic interval, including the primary-care component, was particularly important in determining the overall time to diagnosis. [22] The present findings are therefore consistent with contemporary evidence that reducing diagnostic delay requires attention to the entire pathway rather than focusing exclusively on the final diagnostic procedure.

In the present study, 12.0% of women had an overall diagnostic interval of ≤ 30 days, 22.7% had an interval of 31–60 days, 26.0% had an interval of 61–90 days, and 39.3% had an interval exceeding 90 days. Thus, 65.3% of participants required more than 60 days from symptom onset to histopathological confirmation.

This finding indicates a substantial diagnostic burden in the study population. However, the >90 -day category should be interpreted as an extended overall diagnostic interval unless a formal threshold for “diagnostic delay” has been predefined in the methodology. A recent study of women with breast and gynaecological cancer used >90 days as an important marker of prolonged total interval and identified healthcare-pathway characteristics associated with longer diagnostic times. [22]

The present findings are also comparable in magnitude with earlier evidence from women with gynaecological malignancies. Vandborg *et al.*, reported a median total diagnostic delay of 101 days across several gynaecological malignancies, demonstrating that prolonged diagnostic intervals have been recognized across different healthcare settings. [23] A systematic review of cervical cancer diagnostic delay likewise reported substantial variation in delayed diagnosis, with

median delays ranging from 59 to 210 days across included studies. [3]

Importantly, differences between studies should be interpreted cautiously because definitions of diagnostic delay, starting points, healthcare systems, cancer types, and methods of measuring time intervals vary considerably. Therefore, the present result should primarily be interpreted within the context of the current study population and its definition of overall diagnostic interval.

The most frequently reported reason for delay in the present study was lack of awareness (36.0%), followed by financial constraints (31.3%), delayed referral (27.3%), repeated consultation (25.3%), delay in diagnostic investigations (23.3%), fear of cancer (20.7%), and waiting for investigation or report results (18.7%). Transportation difficulties and reluctance or embarrassment was also reported.

These findings support the multifactorial nature of diagnostic delay. Lack of awareness may contribute to delayed recognition of suspicious symptoms and late presentation, while financial difficulties may limit access to consultations, investigations, and transportation. A systematic review of gynaecological cancer diagnostic delay identified patient knowledge, demographic characteristics, symptom interpretation, primary-care factors, referral processes, and access to investigations as important contributors to delayed diagnosis. [16]

The finding that delayed referral and repeated consultation were common in the present study highlights the importance of health-system and provider-related factors. In the systematic review by Nnaji *et al.*, factors affecting timely diagnosis in low- and middle-income countries included barriers to accessing care and delays within the diagnostic process [17]. Similarly, evidence from Bangladesh has identified patient and system-level factors as contributors to delays in cervical cancer diagnosis and treatment. [18,19]

Fear of cancer and reluctance or embarrassment may also discourage women from seeking or continuing medical care, particularly when symptoms involve vaginal bleeding or other sensitive gynaecological complaints. The systematic review by Allahqoli *et al.*, categorized knowledge and other patient-related characteristics among important determinants of cervical cancer diagnostic delay. [3]

The overall pattern observed in this study is broadly consistent with international evidence demonstrating that diagnostic delay in gynaecological cancer is not attributable to a single factor. Williams *et al.*, identified patient-related, primary-care, and health-system factors as interconnected contributors to delayed diagnosis. [16] Nnaji *et al.*, similarly demonstrated that timely cancer diagnosis in low- and middle-income

countries is influenced by access-related and diagnostic-system barriers. [17]

The present study also supports the importance of referral organization. DeMari *et al.*, demonstrated variation in referral patterns for gynecologic oncology consultation across healthcare institutions, emphasizing the role of referral systems in access to specialist care. [7] More recently, rapid-access pathways have been proposed as an approach to streamline specialist referral, diagnostic investigations, and confirmation of suspected gynaecological cancers. [24]

For ovarian cancer specifically, Vela-Vallespin *et al.*, reported that diagnostic pathways and primary-care involvement were important components of the prehospital diagnostic process, while stage at diagnosis remained strongly associated with outcomes. [20] More recent evidence from Soppe *et al.*, further suggests that the relationship between diagnostic timing and ovarian cancer outcomes is complex and may be affected by the “wait time paradox”; nevertheless, the authors concluded that earlier diagnosis may potentially improve outcomes for some patients and that better diagnostic strategies warrant further investigation. [25]

The findings of the present study have several practical implications. First, women should be encouraged to seek medical attention promptly for persistent abnormal vaginal bleeding, postmenopausal bleeding, abnormal discharge, pelvic pain, abdominal distension, or other suspicious symptoms. Second, healthcare providers at primary and secondary levels should maintain a high index of suspicion when symptoms persist or recur and should avoid unnecessary repeated consultations without appropriate diagnostic escalation. [16,21]

Third, referral pathways between primary care, secondary hospitals, private facilities, and tertiary oncology services should be clearly defined. Rapid-access or fast-track pathways can help standardize referral, specialist assessment, diagnostic investigations, and communication of results. [24] Evidence from low- and middle-income countries also suggests that interventions addressing healthcare-worker capacity and access barriers are feasible approaches to improving timely cancer diagnosis. [26]

Finally, reducing diagnostic delay requires coordinated improvement across the entire pathway. Public awareness alone is unlikely to eliminate delay if women continue to face financial barriers, limited diagnostic access, repeated consultations, or slow referral processes. A combination of symptom awareness, appropriate clinical assessment, efficient referral, accessible diagnostic facilities, and timely reporting is therefore more likely to reduce the overall diagnostic interval.

Overall, the present study demonstrates that women with newly diagnosed gynaecological malignancies experienced a considerable interval between symptom onset and histopathological confirmation. The mean overall diagnostic interval was 95.6 ± 48.3 days, and more than one-third of the participants required more than 90 days for definitive diagnosis. The delay was distributed across multiple stages of the healthcare pathway, including patient presentation, referral, specialist access, and diagnostic investigation.

The findings therefore indicate that diagnostic delay in this setting is a cumulative and multifactorial phenomenon rather than the consequence of a single failure point. Addressing patient awareness, financial and transportation barriers, referral efficiency, repeated consultations, and access to diagnostic investigations may help shorten the diagnostic pathway. Establishment of coordinated referral and rapid-access diagnostic pathways may be particularly valuable in reducing avoidable delays among women presenting with symptoms suggestive of gynaecological malignancy.

LIMITATIONS

This study was conducted at a single tertiary cancer centre with a relatively small sample size of 150 participants, which may limit the generalizability of the findings. Information regarding symptom onset, previous consultations, and referral history was partly based on participants' recall and may therefore be subject to recall bias. As the study included only women who reached the tertiary oncology centre, it may not represent women who remained undiagnosed or did not seek medical care. Furthermore, the observational design limits the ability to establish causal relationships between individual factors and diagnostic delay.

CONCLUSION

The study demonstrated a considerable diagnostic interval among women with newly diagnosed gynaecological malignancies, with delays occurring at multiple stages of the healthcare pathway. Lack of awareness, financial constraints, delayed referral, repeated consultations, and delays in diagnostic investigations were important contributors. Strengthening awareness, improving referral pathways, ensuring timely diagnostic investigations, and establishing coordinated rapid-access services may help reduce diagnostic delay and facilitate earlier diagnosis of gynaecological malignancies.

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