Clinicopathological Study Of Gestational Trophoblastic Disease (GTD) In A Tertiary Care Hospital

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KEYWORDS

Gestational trophoblastic disease, complete mole, choriocarcinoma, β-hCG, suction and evacuation, histopathology, chemotherapy, Bangladesh

ABSTRACT:

Background: Gestational trophoblastic disease (GTD) comprises a spectrum of disorders arising from abnormal trophoblastic proliferation, ranging from benign hydatidiform moles to malignant neoplasms such as choriocarcinoma. Early diagnosis and appropriate treatment are essential to ensure favorable outcomes and preserve fertility. **Aim of the study:** The aim of this study was to evaluate the clinicopathological characteristics, treatment modalities, and follow-up outcomes of patients diagnosed with GTD in a tertiary care hospital. **Methods:** This prospective observational study was conducted over one year in the Department of Obstetrics and Gynecology at a tertiary care hospital in Bangladesh. A total of 72 histopathologically confirmed GTD cases were enrolled based on set inclusion and exclusion criteria. Data on clinical features, serum β-hCG levels, histological subtypes, treatment, and outcomes were recorded. Statistical analysis was performed using SPSS version 26. Continuous variables were expressed as mean ± SD, categorical data as frequencies and percentages. A p-value ≤ 0.05 was considered statistically significant. **Result:** The majority of patients were aged 21–30 years (63.89%), with 84.72% presenting at ≤20 weeks of gestation. Complete mole was the most common subtype (83.33%), followed by partial mole and invasive mole (6.94% each), and choriocarcinoma (2.78%). Common symptoms included amenorrhea (100%), per vaginal bleeding (91.67%), and abdominal pain (40.28%). Mean β-hCG was 365,000 ± 130,000 mIU/mL. Half of the complete mole cases were successfully treated with suction and evacuation alone. β-hCG normalized within 8 weeks in 72.22% of patients, while 27.78% developed persistent GTD. No mortality was observed; 97.22% remained disease-free at one year. **Conclusion:** Complete mole remains the predominant GTD subtype, with early gestational presentation and elevated β-hCG levels aiding diagnosis. Timely management tailored to the disease subtype, combined with regular follow-up, ensures excellent prognosis with high survival and low recurrence.

INTRODUCTION

Gestational trophoblastic disease (GTD) encompasses a heterogeneous group of pregnancy-related disorders marked by abnormal proliferation of trophoblastic tissue following fertilization events, ranging from benign hydatidiform moles to malignant gestational trophoblastic neoplasia (GTN) [1,2]. Globally, the reported incidence

spans a striking range-from approximately 23 to 1,299 cases per 100,000 pregnancies-highlighting significant regional variability influenced by diagnostic practices, registry accuracy, and potential environmental factors [3]. Hydatidiform moles, including complete and partial forms, account for about 80% of GTD presentations, while malignant entities such as invasive mole, choriocarcinoma, placental-site trophoblastic tumour (PSTT), and epithelioid trophoblastic tumor (ETT) comprise the remainder [4]. The pathogenesis of GTD involves aberrant fertilization: complete hydatidiform moles typically arise from androgenetic diploid genomes, whereas partial moles are triploid, resulting from diandric dispermic events [5]. From a clinical standpoint, GTD frequently manifests in early gestation with vaginal bleeding, uterine enlargement disproportionate to gestational age, markedly elevated serum β-human chorionic gonadotropin (β-hCG), theca lutein ovarian cysts, hyperemesis gravidarum, and occasionally signs of hyperthyroidism or early-onset pre-eclampsia [6-8]. Ultrasound imaging typically reveals characteristic patterns—such as the classic "snowstorm" or mixed echogenic and cystic appearance-providing a strong basis for initial diagnosis [9]. Risk factors for GTD are well-established: maternal age extremes-particularly women under 20 and over 35, with a five- to ten-fold increase in risk beyond age 45-constitute a major demographic determinant. A history of prior molar pregnancy further amplifies risk, whereas dietary factors such as low carotene and vitamin intake may also contribute [10]. Although overall rare, malignant GTN carries substantial morbidity if not promptly recognized; however, it is highly responsive to chemotherapy, with single-agent regimens achieving near-100% remission in low-risk cases and combination therapy yielding approximately 90% survival in high-risk disease [11,12]. Early detection, accurate risk stratification via the FIGO/WHO scoring system, and diligent post-evacuation monitoring of β-hCG levels are thus cornerstones of effective management [13]. Histopathological examination-with adjuncts like p57 immunohistochemistry and DNA genotyping-remains vital for distinguishing complete from partial moles and guiding clinical decision-making [14]. Global monitoring of GTD is limited by inconsistent definitions, underreporting, and lack of centralized registries, hindering regional comparisons. Despite improved surveillance, 15–20% of complete moles persist post-evacuation, with a smaller fraction progressing to GTN, especially choriocarcinoma [15]. Imaging modalities including chest radiography, computed tomography (CT), magnetic resonance imaging (MRI), and positron emission tomography (PET) are also employed, particularly for staging and identifying metastatic spread, although their routine use varies. Current best practices include serial β-hCG monitoring until normalization, contraception throughout follow-up, and timely referral for chemotherapy if hCG levels plateau or rise [16,17]. Despite advancements, gaps remain in linking early clinical and sonographic features with histopathological subtypes and disease progression. Strong clinicopathological correlation is needed to identify early predictors, guide personalized care, and safeguard fertility. This study aimed to evaluate the clinicopathological characteristics of Gestational Trophoblastic Disease (GTD) among patients attending a tertiary care hospital, with a focus on identifying patterns in clinical presentation, histopathological subtypes, and associated demographic factors.

METHODOLOGY & MATERIALS

This study was conducted in the Department of Gynecological Oncology, Bangladesh Medical University, Dhaka, Bangladesh. The study was carried out over a period of 1 year, from January 2024 to December 2024, the study evaluated the clinicopathological profile of Gestational Trophoblastic Disease (GTD) cases presenting to this tertiary care center. Using a purposive sampling method, a total of 72 patients with a diagnosis of GTD were enrolled in this prospective observational study. All diagnoses were confirmed based on clinical, radiological, biochemical, and histopathological findings.

Inclusion Criteria

- Women of any reproductive age presenting with suspected GTD
- Histopathologically confirmed cases of hydatidiform mole, invasive mole, choriocarcinoma, or placental site trophoblastic tumor
- Availability of complete clinical and follow-up data
- Informed consent for participation in the study

Exclusion Criteria

- Patients with incomplete clinical or histopathological data
- Coexisting malignancies unrelated to GTD
- Patients who refused follow-up or were lost immediately after diagnosis
- Previously treated cases referred for recurrence only

Data Collection

Data were collected prospectively using a structured case record form. Baseline characteristics such as age, gravidity, gestational age at diagnosis, and history of previous molar pregnancy were documented. Patients were

categorized into age groups (≤20 years, 21–30 years, >30 years), and gestational age was stratified as ≤12 weeks, 13–20 weeks, and >20 weeks. Obstetric history was recorded, classifying patients as either primigravida or multigravida. Detailed clinical features at presentation were noted, including amenorrhea, per vaginal bleeding, passage of grape-like vesicles, hyperemesis gravidarum, abdominal pain, features of hyperthyroidism, pre-eclampsia before 20 weeks, and respiratory symptoms such as cough and/or hemoptysis. All patients underwent serum β-hCG estimation at diagnosis, and the levels were categorized into four groups: <50,000 mIU/mL, 50,000–100,000 mIU/mL, 100,001–500,000 mIU/mL, and >500,000 mIU/mL. The mean ± SD of β-hCG levels was also calculated to reflect the biochemical burden of disease. Each case was subjected to histopathological evaluation following uterine evacuation or hysterectomy. The GTD subtypes identified included complete mole, partial mole, invasive mole, and choriocarcinoma. There were no recorded cases of placental site trophoblastic tumor (PSTT) in this cohort. Initial treatment modalities were individualized and included suction and evacuation (S&E), chemotherapy, hysterectomy, or a combination of these, depending on the clinical condition, histological subtype, and response to initial therapy. The association between GTD subtypes and primary treatment choices was analyzed. Patients were followed up regularly with serial serum β-hCG monitoring, clinical assessment, and pelvic imaging when required. Outcomes evaluated included β-hCG normalization within 8 weeks, development of persistent GTD, recurrence within 6 months, loss to follow-up, 1-year disease-free survival, and mortality. Informed written consent was obtained from all participants prior to inclusion. The study received ethical approval from the Institutional Review Board (IRB) of the hospital.

Statistical Analysis

Data were entered and analyzed using SPSS software (version 26). Continuous variables were presented as mean ± standard deviation (SD), and categorical variables were expressed as frequencies and percentages. Descriptive statistics were primarily used due to the categorical nature of most variables. Associations between GTD subtypes and treatment modalities, as well as follow-up outcomes, were evaluated descriptively. A p-value ≤ 0.05 was considered statistically significant where applicable.

RESULT

A total of 72 patients diagnosed with gestational trophoblastic disease (GTD) were included in this study. The majority of participants were aged between 21 and 30 years (63.89%), followed by those over 30 years (25.00%) and ≤20 years (11.11%). Gravidity was evenly distributed, with half being primigravida (50.00%) and the other half multigravida (50.00%). Regarding gestational age at diagnosis, most patients presented between 13 and 20 weeks of gestation (45.83%), with 38.89% at ≤12 weeks and 15.28% beyond 20 weeks (Table 1). Regarding previous molar pregnancy, 6.94% of participants reported a history of prior molar gestation, while the majority (93.06%) had no such history (Figure 1). Clinical presentations at diagnosis were predominantly amenorrhea (100.00%) and per vaginal bleeding (91.67%). Other frequent symptoms included abdominal pain (40.28%), hyperemesis gravidarum (36.11%), and passage of grapes-like vesicles (30.56%). Less common features were hyperthyroidism (8.33%), pre-eclampsia before 20 weeks (6.94%), and cough or hemoptysis (5.56%) (Table 2). Table 3 presented that serum β-hCG levels varied widely, with 38.89% of patients exhibiting levels between 100,001 and 500,000 mIU/mL, followed by 27.78% with levels exceeding 500,000 mIU/mL. Levels below 50,000 mIU/mL were seen in 11.11% of cases. The mean β-hCG level at diagnosis was 365,000 ± 130,000 mIU/mL. Histopathological examination revealed that complete mole (CM) was the predominant subtype, accounting for 83.33% of cases. Partial mole (PM) and invasive mole (IM) each constituted 6.94%, while choriocarcinoma (CC) accounted for 2.78%. No cases of placental site trophoblastic tumor (PSTT) were observed (Table 4). Table 5 showed that treatment modalities varied according to subtype. Among CM patients, 50.00% were treated successfully with suction and evacuation (S&E) alone, 26.39% required S&E combined with chemotherapy, and a smaller number underwent hysterectomy with chemotherapy (2.78%) or chemotherapy alone due to late diagnosis (4.17%). All PM patients (6.94%) were managed successfully with S&E alone. For IM, chemotherapy was the primary treatment (5.56%), with one patient receiving hysterectomy only (1.39%). Both CC patients (2.78%) underwent hysterectomy followed by chemotherapy. On follow-up, β-hCG normalized within eight weeks in 72.22% of patients. However, persistent GTD requiring further management was observed in 27.78%. Recurrence within six months was rare (4.17%), and only 5.56% of patients were lost to follow-up. Notably, 97.22% of patients were alive and disease-free at one year, with no mortality reported (Table 6).

Table 1: Baseline Demographic and Obstetric Characteristics (n = 72).

Variables	Frequency (n)	Percentage (%)
Age (years)		
≤ 20	8	11.11
21–30	46	63.89
> 30	18	25.00

Gravida		
Primigravida	36	50.00
Multigravida	36	50.00
Gestational Age (weeks)		
≤ 12	28	38.89
13–20	33	45.83
> 20	11	15.28

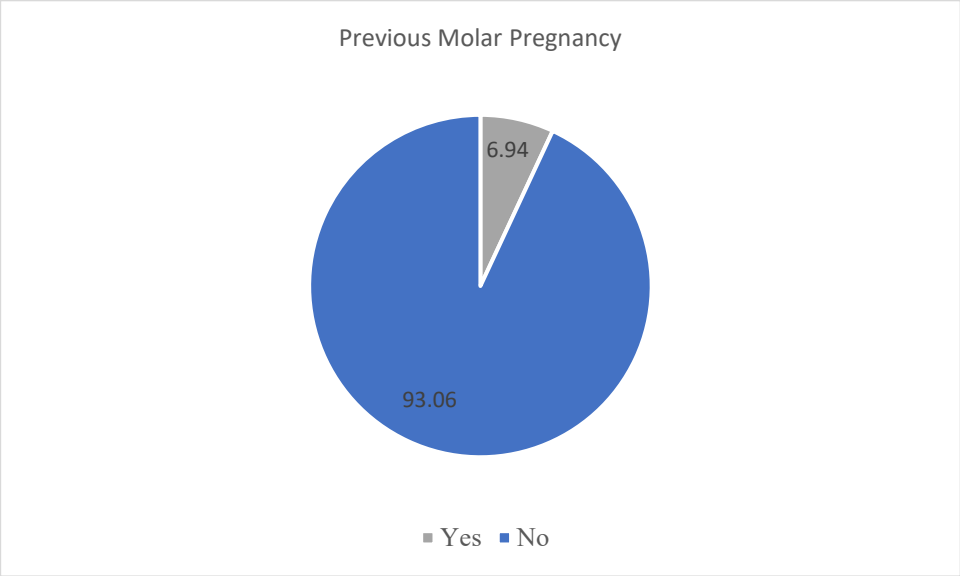

Figure 1: Distribution of Previous Molar Pregnancy Among Study Participants (n = 72).

Table 2: Clinical Presentations at Time of Diagnosis (n = 72).

Clinical Features	Frequency (n)	Percentage (%)
Amenorrhea	72	100.00
Per Vaginal Bleeding	66	91.67
Passage of Grapes-like Vesicles	22	30.56
Hyperemesis Gravidarum	26	36.11
Pain in Abdomen	29	40.28
Features of Hyperthyroidism	6	8.33
Pre-eclampsia Before 20 Weeks	5	6.94
Cough and/or Hemoptysis	4	5.56

Table 3: Serum β-hCG Levels at Time of Diagnosis (n = 72).

β-hCG Level Range (mIU/mL)	Frequency (n)	Percentage (%)
< 50,000	8	11.11
50,000–100,000	16	22.22
100,001–500,000	28	38.89
> 500,000	20	27.78
Mean ± SD	365,000 ± 130,000	

Table 4: Histopathological Subtypes of GTD (n = 72).

GTD Subtype	Frequency (n)	Percentage (%)
Complete Mole (CM)	60	83.33
Partial Mole (PM)	5	6.94
Invasive Mole (IM)	5	6.94
Choriocarcinoma (CC)	2	2.78
Placental Site Trophoblastic Tumor (PSTT)	0	0.00

Table 5: Correlation of Treatment with GTD Subtypes (n = 72).

GTD Subtype	Primary Treatment	No. of Cases	% within Subtype
CM (n=60)	Only S&E (cured)	36	50.00
	S&E + Chemotherapy	19	26.39
	Hysterectomy + Chemotherapy	2	2.78
	Chemotherapy Only (late diagnosis)	3	4.17
PM (n=5)	Only S&E (all resolved)	5	6.94
IM (n=5)	Chemotherapy Only	4	5.56
	Hysterectomy Only	1	1.39
CC (n=2)	Hysterectomy + Chemotherapy	2	2.78

Table 6: Follow-up Outcomes Post-Treatment (n = 72).

Outcomes	Frequency (n)	Percentage (%)
β-hCG Normalized Within 8 Weeks	52	72.22
Persistent GTD (Neoplasia)	20	27.78
Recurrence Within 6 Months	3	4.17
Lost to Follow-up	4	5.56
Alive and Disease-Free at 1 Year	70	97.22
Mortality	0	0.00

DISCUSSION

Gestational trophoblastic disease (GTD) encompasses a spectrum of disorders arising from abnormal proliferation of trophoblastic tissue, ranging from benign hydatidiform moles to malignant choriocarcinoma and invasive moles [18]. This prospective study comprehensively evaluated the demographic, clinical, and treatment outcomes of 72 patients diagnosed with gestational trophoblastic disease (GTD). The majority of participants were aged 21–30 years (63.9%), aligning with the well-established reproductive age group commonly affected by GTD [19]. The equal distribution between primigravida and multigravida (50% each) corresponds with findings from Rijal (2018), who noted that molar pregnancies may occur irrespective of parity status [20]. The predominance of early gestational presentation (≤ 20 weeks in 84.7% of cases) is consistent with classical GTD clinical courses described by Neral et al., where most patients present during the first or early second trimester [21]. Amenorrhea was universal (100%) and per vaginal bleeding occurred in 91.7% of cases, confirming that these remain hallmark clinical features [22]. The presence of hyperemesis gravidarum (36.1%) and abdominal pain (40.3%) further substantiates the symptomatic spectrum reported by others [23,24]. The relatively low frequency of hyperthyroidism (8.3%) and early pre-eclampsia (6.9%) reflects the varied systemic manifestations seen in GTD [25,26]. Serum β-hCG levels were markedly elevated, with 66.7% exceeding 100,000 mIU/mL, consistent with trophoblastic proliferation and excessive hormone secretion characteristic of molar pregnancies [27]. The mean β-hCG of 365,000 ± 130,000 mIU/mL is in line with previous reports indicating β-hCG levels often reach several hundred thousand in complete moles [28]. Histopathologically, complete mole (CM) accounted for 83.3% of cases, partial mole (PM) for 6.9%, invasive mole (IM) for 6.9%, and choriocarcinoma (CC) for 2.8%. This distribution showed similarities with the studies of Jagtap et al., and Bruce and Sorosky [22,29]. The absence of placental site trophoblastic tumor (PSTT) is not unexpected given its rarity (<1% of GTD cases) [30]. Regarding treatment, suction and evacuation (S&E) alone cured 50% of complete mole patients, while adjunct chemotherapy was required in approximately 33%. All partial mole cases resolved with S&E alone. Invasive mole and choriocarcinoma cases necessitated more aggressive chemotherapy and surgical interventions, reflecting their malignant potential [26,31]. These therapeutic patterns align well with established management guidelines recommending S&E as first-line for non-invasive GTD and chemotherapy for invasive/malignant forms [29]. Follow-up outcomes were favorable: β-hCG normalization within 8 weeks occurred in 72.2% of cases, with 27.8% developing persistent GTD requiring further treatment. Recurrence was low (4.2%), and no mortality was observed. These results corroborate literature demonstrating excellent prognosis with prompt diagnosis and appropriate management, including surveillance with serial β-hCG measurements [32,33].

Limitations of the study: This hospital-based study was limited by its single-center design, which may affect the external validity of the findings. The relatively short duration restricted the ability to observe long-term outcomes such as late recurrence, delayed complications, and long-term survival. Additionally, molecular techniques like p57 immunostaining or DNA genotyping were not utilized, which could have enhanced diagnostic accuracy in distinguishing GTD subtypes. Despite these limitations, the study provides valuable insights into the clinicopathological spectrum and treatment outcomes of GTD.

CONCLUSION

This clinicopathological study highlights that complete mole remains the predominant form of gestational trophoblastic disease (GTD), most frequently affecting women aged 21–30 years. Common clinical presentations such as amenorrhea, per vaginal bleeding, and markedly elevated β-hCG levels facilitated early diagnosis, with histopathology confirming diagnosis in all cases. Suction and evacuation proved effective for non-invasive forms, while chemotherapy and hysterectomy were required for malignant subtypes. Follow-up outcomes were favorable, with high rates of β-hCG normalization and excellent one-year survival. These findings reinforce the importance of early recognition, tailored treatment based on GTD subtype, and diligent follow-up to ensure optimal outcomes and fertility preservation in affected women.

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