# Clinico-epidemiologic criteria and outcome of gestational trophoblastic neoplasia: A retrospective analysis of the Mansoura University experience




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## Purpose

This study aimed to investigate the clinico-epidemiological characteristics, treatment outcomes, and prognostic factors of gestational trophoblastic neoplasia (GTN) patients managed at a tertiary care center in Egypt.

## Methods

This retrospective study included 138 GTN patients aged ≥18 years with adequate medical records, and a minimum 6 month follow-up. The diagnosis was confirmed by histopathology or elevated serum β-hCG levels. Data were collected from hospital records from January 2011 and December 2022 , including demographics, clinical presentation, tumor characteristics, FIGO staging, treatment modalities, and toxicity (CTCAE v5.0). Patients were stratified into choriocarcinoma (n=12, 8.7%) and non choriocarcinoma groups (n=126, 91.3%), including post molar GTN (55.8%), invasive mole (30.4%), and PSTT (5.1%).

## Results

Choriocarcinoma patients presented with significantly higher metastatic rates (83.3% vs. 5.8%, p<0.001), advanced stage (75% Stage III IV vs. 23.8%), and larger tumors >5 cm (62.5% vs. 34.1%). First line methotrexate achieved remission in 78.9% of non choriocarcinoma patients compared to 8.3% of choriocarcinoma patients. EMA/CO as second line therapy yielded 55.5% remission in choriocarcinoma. Histopathological type, stage, risk classification and number of lines of chemotherapy were the strongest predictive variables for response to treatment (all p < 0.001). The only significant demographic predictor of better response was a positive molar pregnancy history (p=0.049).

**Table 1 Tumor Characteristics in GTN Patients**

| | Choriocarcinoma (N=12) | Non-choriocarcinoma (N=126) | | | |
|---|---|---|---|---|---|
| | | Post-molar GTN (n=77) | Invasive mole (n=42) | PSTT (n=7) | Total (N=138) |
| **Tumor Size (cm) (86 patients unknown - 62.5%)** | | | | | |
| -<3 cm | 0 | 6 | 4 | 0 | 10 (7.2%) |
| - 3-5 cm | 3 (2.2%) | 9 | 8 | 2 | 22 (15.9%) |
| ->5 cm | 5 (3.6%) | 9 | 5 | 1 | 20 (14.4%) |
| **Metastasis (24 patients unknown - 17.4%)** | | | | | |
| - No | 2 (1.6%) | 62 | 29 | 5 | 98 (71.0%) |
| - Yes | 10 (7.2%) | 2 | 4 | 0 | 16 (11.6%) |
| - Lung | 9 | 2 | 3 | 0 | 14 |
| - Lung & Liver | 0 | 0 | 1 | 0 | 1 |
| - Lung & Brain | 1 (0.8%) | 0 | 0 | 0 | 1 |
| **Stage (24 patients unknown - 17.4%)** | | | | | |
| - Stage I-II | 2 (1.6%) | 62 | 29 | 5 | 98 (71.0%) |
| - Stage III | 9 (6.6%) | 2 | 3 | 0 | 14 (10.0%) |
| - Stage IV | 1 (0.8%) | 0 | 1 | 0 | 2 (1.6%) |

**Table 2 Risk Stratification, and Tumor Markers in GTN Patients**

| | Choriocarcinoma (N=12) | Non-choriocarcinoma (N=126) | | | Total (N=138) |
|---|---|---|---|---|---|
| | | Post-molar GTN (n=77) | Invasive mole (n=42) | PSTT (n=7) | |
| **Risk Classification (31 patients unknown - 22.4%)** | | | | | |
| - Low | 4 (3.2%) | 59 | 29 | -* | 92 (66.5%) |
| - High | 6 (4.5%) | 4 | 1 | -* | 11 (7.9%) |
| - Ultrahigh | 2 (1.6%) | 0 | 2 | -* | 4 (3.2%) |
| **Beta-hCG (IU/L) (18 patients unknown - 13%)** | | | | | |
| -<$10^3$ | 1 (0.8%) | 13 | 6 | 3 | 23 (16.6%) |
| - $10^3$ -<$10^4$ | 2 (1.6%) | 22 | 9 | 2 | 35 (25.4%) |
| - $10^4$ -<$10^5$ | 6 (4.5%) | 27 | 17 | 0 | 50 (36.2%) |
| - ≥$10^5$ | 2 (1.6%) | 6 | 4 | 0 | 12 (8.8%) |

**Table 3 Impact of Pathological Characteristics, Stage, and Treatment Modalities on Response**

| | Remission (N=81) | Stationary (N=15) | Progression (N=16) | P-value |
|---|---|---|---|---|
| **Histopathological Type** | | | | |
| - Choriocarcinoma | 2 (1.8%) | 5 (4.5%) | 4 (3.6%) | <0.001* |
| - Non-choriocarcinoma | 79 (7.5%) | 10 (8.9%) | 12 (10.7%) | |
| **Non-choriocarcinoma Subtypes** | | | | |
| - Post-molar GTN | 50 | 4 | 8 | 0.002* |
| - Invasive mole | 24 | 5 | 4 | |
| - Placental site trophoblastic tumor | 5 | 1 | 0 | |
| **Tumor Size (cm)** | | | | |
| -<3 cm | 8 (7.1%) | 2 (1.8%) | 0 | 0.087 |
| - 3-5 cm | 11 (9.8%) | 5 (4.5%) | 5 (4.5%) | |
| ->5 cm | 11 (9.8%) | 2 (1.8%) | 5 (4.5%) | |
| - Unknown | 51 (45.5%) | 6 (5.4%) | 6 (5.4%) | |
| **Stage** | | | | |
| - Stage I-II | 73 (65.2%) | 10 (8.9%) | 11 (9.8%) | <0.001* |
| - Stage III | 4 (3.6%) | 3 (2.7%) | 5 (4.5%) | |
| - Stage IV | 0 | 2 (1.8%) | 0 | |
| - Unknown | 4 (3.6%) | 0 | 0 | |
| **Risk Classification** | | | | |
| - Low | 71 (63.4%) | 8 (7.1%) | 11 (9.8%) | <0.001* |
| - High | 3 (2.7%) | 3 (2.7%) | 5 (4.5%) | |
| - Ultrahigh | 0 | 4 (3.6%) | 0 | |
| - Unknown | 7 (6.3%) | 0 | 0 | |
| **Beta-hCG (IU/L)** | | | | |
| -<$10^3$ | 13 (11.8%) | 3 (2.7%) | 5 (4.5%) | 0.155 |
| - $10^3$ -<$10^4$ | 18 (16.4%) | 3 (2.7%) | 6 (5.5%) | |
| - $10^4$ -<$10^5$ | 32 (28.6%) | 6 (5.5%) | 4 (3.6%) | |
| - ≥$10^5$ | 5 (4.5%) | 3 (2.7%) | 1 (0.9%) | |
| - Unknown | 13 (11.6%) | 0 | 0 | |
| **Surgery** | | | | |
| - No | 69 (61.6%) | 10 (8.9%) | 13 (11.6%) | 0.648 |
| - TAH&BSO | 9 (8%) | 4 (3.6%) | 2 (1.8%) | |
| - Hysterectomy | 2 (1.8%) | 1 (0.9%) | 1 (0.9%) | |
| - Local myometrium resection | 1 (0.9%) | 0 | 0 | |
| **Treatment Plan** | | | | |
| - Surgery alone | 5 (4.5%) | 0 | 0 | 0.072 |
| -Systemic therapy alone | 69 (61.6%) | 10 (8.9%) | 13 (11.6%) | |
| - Both | 7 (6.3%) | 5 (4.5%) | 3 (2.7%) | |
| **Number of Lines of Systemic Treatment** | | | | |
| - No (surgery only) | 5 (4.5%) | 0 | 0 | <0.001* |
| - 1 line | 76 (67.9%) | 1 (0.9%) | 3 (2.7%) | |
| - 2 lines | 0 | 13 (11.6%) | 12 (10.7%) | |
| - 3 lines | 0 | 1 (0.9%) | 1 (0.9%) | |

Nb: there was missing data about treatment or response of 26 patient

**Table 4 Demographic Criteria and Outcome of Choriocarcinoma versus Non Choriocarcinoma Patients**

| Factor | Choriocarcinoma N:12 | Non choriocarcinoma N:126 | p-value |
|---|---|---|---|
| **Age** | | | |
| - <40 | 7 (58.3%) | 98 (77.8%) | 0.131 |
| - ≥ 40 | 5 (41.7%) | 28 (22.2%) | |
| **past or family history of molar pregnancy** | | | |
| - Positive | 4 (2.9) | 91 (65.9) | 0.005* |
| - No | 8 (5.8%) | 35 (25.4%) | |
| **Co-morbidity** | | | |
| -No | 12 (100%) | 119 (94.4%) | 0.402 |
| -Yes | 0 | 7 (5.6%) | |
| **Parity** | | | |
| - Nullipara | 1 (8.3%) | 38 (30.2%) | 0.187 |
| - Primiparous | 1 (8.3%) | 14 (11.1%) | |
| - Multipara | 10 (83.4%) | 69 (54.7%) | |
| **Tumor size in cm** | | | |
| - < 3 cm | 0 | 10 (7.9%) | 0.193 |
| -3 – 5 cm | 3 (25%) | 19 (15.1%) | |
| - >5 cm | 5 (41.6%) | 15 (11.9%) | |
| **Metastasis** | | | |
| - No | 2(16.6%) | 95 (75.4%) | < 0.001* |
| -Yes | 10 (83.4%) | 6 (4.7%) | |
| **Stage** | | | |
| - Stage I-II | 2(16.6%) | 96 (76.2%) | < 0.001* |
| - Stage III | 9 (75.1%) | 5 (3.45%) | |
| - Stage IV | 1 (8.3%) | 1 (0.8%) | |
| **Risk classification** | | | |
| - Low | 4 (33.35%) | 90 (71.4%) | < 0.001* |
| -High | 6 (50%) | 5 (3.45%) | |
| - Ultrahigh | 2(16.65%) | 2 (1.6 %) | |
| **Beta HCG** | | | |
| - < $10^3$ | 1 (8.3%) | 22 (17.4%) | 0.487 |
| -$10^3$ - < $10^4$ | 2(16.6%) | 33 (26.2%) | |
| - $10^4$ - <$10^5$ | 6 (50 %) | 44 (34.8%) | |
| - ≥ $10^5$ | 2(16.6%) | 10 (7.9%) | |
| **Surgery** | | | |
| - No | 8 (66.7%) | 84 (66.6 %) | 0.138 |
| - Yes | 4 (33.3%) | 16 (12.7%) | |
| **First line protocol type** | | | |
| - Methotrexate | 9 (75%) | 95 (75.4%) | 0.004* |
| - EMA/CO | 2(16.6%) | 2 (1.6 %) | |
| **Response to first line of treatment** | | | |
| - Remission | 1 (8.3%) | 75 (59.5%) | < 0.001* |
| - Stationary | 5 (41.6%) | 10 (7.9%) | |
| - Progression | 4 (33.3%) | 12 (9.5%) | |
| **Second line protocol type** | | | |
| - EMA/CO | 6 (50%) | 11 (8.7%) | < 0.001* |
| - Dactinomycin | 0 | 7 (5.6%) | |
| - EP | 2(16.6%) | 0 | |
| -Taxol/cisplatin | 1 (8.3%) | 0 | |
| **Response to second line of treatment** | | | |
| -Remission | 5 (41.6%) | 16 (12.7%) | 0.193 |
| -Regression | 1 (8.3%) | 1 (0.8%) | |
| -Stationary | 1 (8.3%) | 0 | |
| - Progression | 3 (25 %) | 1 (0.8%) | |

## Results

Choriocarcinoma represents an aggressive GTN subtype with poor response to single agent chemotherapy, high metastatic potential, and advanced stage at presentation. Histological subtype and FIGO risk score are critical prognostic determinants. A multidisciplinary team is required for optimal management.


**Keywords:** Choriocarcinoma, Chemotherapy Response, FIGO Staging, Gestational Trophoblastic Neoplasia, Methotrexate