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Implementation of the morbidity-mortality review at the day hospital in Rabat Morocco: A case of a pregnancy discovered in a patient undergoing chemotherapy.

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Abstract

Amenorrhea in a patient receiving chemotherapy is often considered chemo-induced amenorrhea. We report a case of a pregnancy discovered in a 36-year-old patient with metastatic breast cancer of the lung and bone, undergoing 4th-line chemotherapy, who presented with secondary amenorrhea in whom a pregnancy test was positive, and a thoraco-abdominal-pelvic CT scan result showed an evolving pregnancy of 20 weeks' amenorrhea. The evolution of the pregnancy was marked by the onset of significant univentricular hydrocephalus.

Keywords: morbidity- mortality review, amenorrhea, pregnancy, chemotherapy

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1. Introduction

The morbidity-mortality review (MMR) is a collective, retrospective and systemic analysis of clinical cases in which an adverse event associated with care or any unexpected complication has occurred, which may or may not (if stopped in time) have caused harm to patients [1]. The aim of this analysis is to enable generic reflection on the circumstances in which the event occurred, and on any actions to be taken to prevent a recurrence [1]. The MMR is aimed at the entire medical and paramedical team in the sector concerned, as well as any healthcare professional involved in the patient's care [2]. The aim of this MMR is to improve professional practices, without looking for a culprit. We report a clinical case of a patient undergoing chemotherapy with amenorrhea secondary to pregnancy, considered to be chemo-induced amenorrhea.

2. Material and methods

The implementation of the morbidity-mortality review (MMR) took place at the day hospital in the medical oncology department at the Institute National Oncology (INO) in Rabat MOROCCO. The Institute National Oncology is a university cancer center within the CHU Ibn Sina in Rabat [3].

Among several existing deep cause analysis methods (the ALARM method, ORION and cause tree analysis) [4], we have chosen ALARM (Association of Litigation And Risk Management). This method was developed by a British research team in the late 90s [5,6], recommended by the HAS and adapted to healthcare establishments. It classifies root causes into 7 categories (patient, strategy and tasks, caregiver, team, work environment, management, constitutional context), each of which contains a list of contributing factors (table1) [4]. After collecting and collating medical information from the patient, who was undergoing teratogenic antitumor treatment, we used the method described above to investigate the root causes that led to the occurrence of the pregnancy.

3. Results and discussion

The stages of the MMR are as follows:

1- Course of events: patient and observation

36-year-old female patient, history: G2P2 mother of 2 children, non-menopausal, followed for positive HER2 negative RH, stage IV lung and bone breast cancer having received 3 lines of palliative chemotherapy.

On February 27, 2023, the patient reported 3 months' amenorrhea with a positive pregnancy test. An abdominal-

pelvic CT scan showed an evolutive pregnancy of 20 weeks' amenorrhea without malformation with minimal progression. The decision was made to wait until after 22 weeks' amenorrhea before initiating 4th-line vinorelbine-based chemotherapy in combination with trastuzumab and zoledronic acid, and to request an obstetric ultrasound for fetal vitality. On April 10, 2023, the patient consulted the emergency department for active breast bleeding. On physical examination, she was conscious, hemodynamically and respiratory stable, with a performance status of 1, and a suppurating ulceration bleeding on contact at mid-thoracic level from the sternal mass. Obstetrical ultrasound revealed a progressive mono-fetal pregnancy estimated at 23 weeks' amenorrhea, and an extra-axial subdural parietal fluid collection. In the surgeon's opinion, there was no urgent indication for surgery. The patient was hospitalized for a hemostatic procedure and transfusion of a total of 5 packed red blood cells, with monitoring of parameters. She was then referred to a gynecologist for pregnancy follow-up. On April 21, 2023, the patient presented with swelling of the left upper limb. A Doppler ultrasound of the upper limb was ordered and revealed superficial thrombophlebitis of the left basilic vein. Anticoagulants were not administered, given the history of heavy bleeding from the breast. An obstetric ultrasound performed revealed an evolving mono-fetal pregnancy at 25 weeks' amenorrhea with significant univentricular hydrocephalus. The 1st course of vinorelbine with trastuzumab and zoledronic acid in 4th line largely improved the bleeding, but on the 2nd course the patient was anxious and did not tolerate it well. The decision was made to reduce the dose of vinorelbine to 15 mg/m².

2- Identification of the care issue

The care problem encountered was the discovery of pregnancy in a patient who had received chemotherapy with a double block trastuzumab pertuzumab during the first trimester of pregnancy.

3- Analysis of contributing factors

An analysis of the contributing factors, was carried out to identify the root causes, the factors contributing to the occurrence of errors, in order to correct them by installing defenses or barriers and thus creating a safer environment [3]. The contributing factors identified during the meeting are related to the patient and mainly to the caregiver:

➔ Patient:

1- Social and family factors: the patient was informed through the post-chemotherapy safety prescription that it is strongly advised to avoid pregnancy during antitumor treatments.

2- Conflicting relationships with carers and care: the patient was unclear about the delay in menstruation, she doubted she was pregnant given that she had unprotected sex with her partner during treatment and she did not inform the doctor leaving him to deduce on his own.

➔ Caregiver:

1- Soft skills and compliance:

- The patient reported the delayed menstruation to the oncologist and gynecologist, nevertheless both doctors did not react as they considered it chemically-induced amenorrhea.
- The doctor continued to prescribe trastuzumab to this patient out of ignorance, even though it is not recommended for the entire duration of pregnancy according to the literature.

2- Physical and mental condition: the doctor was overworked and had no time to investigate the cause of the amenorrhea.

4- Improvement measures

Recent data suggest that several agents used in the treatment of breast cancer have a good safety profile, particularly when started after the first trimester of pregnancy, resulting in live births and low morbidity [7-11]. A few studies have evaluated the use of taxanes, such as docetaxel and paclitaxel, with no increase in the incidence of fetal malformations and other maternal complications when used in the second and third trimesters of pregnancy. The use of trasutuzumab is not recommended during pregnancy, due to the risk of oligohydramnios, anhydramnios, fetal pulmonary hypoplasia, skeletal and developmental abnormalities, and fetal death [12]. In this patient's case, the doctor continued to prescribe trastuzumab even after the pregnancy was discovered. Moreover, the evolution of this patient's pregnancy was marked by the onset of significant univentricular hydrocephalus. This demonstrates the importance of contraception in women of childbearing age undergoing chemotherapy, by means of an intrauterine device, barrier methods or combined non-hormonal methods [12]. During the meeting, between doctors and nurses, a number of questions were asked: why did this happen? What factors contributed to the occurrence of pregnancy during chemotherapy?

The culture of finding someone to blame and punishing them is deeply rooted in our society [13], and the MMR approach is the complete opposite: it erases individual error by analyzing the multifactorial causes of a complication, establishing a positive culture of error to improve practices. This is known as "learning by doing" [1].

Improvement measures were proposed at the time of the meeting to avoid recurrence of this event at the day hospital:

- In all non-menopausal patients of childbearing age, a plasma BHCG assay or urine pregnancy test should be systematically performed as part of the pre-treatment work-up to rule out pregnancy at the start of antitumor treatment.
- During treatment, the physician must:
  - Inform the patient to avoid unprotected sexual intercourse with her partner.
  - Explain to the patient that antitumor treatment can cause malformations and sometimes even fetal death.
  - Know which antitumor treatments are contraindicated during pregnancy.
- Install animated TV screens at the day hospital to raise awareness among patients and their spouses of the need to take precautions to avoid pregnancy during antitumor treatments.

Table 1 : ALARM categories and essential contributory factors

Category	Contributory factors
Patient	Severity of condition Severity of care indication Communication barriers Social and family factors Conflicting relationships with caregivers and care providers
Strategy and Tasks	Therapeutic strategy Tasks Complementary examinations Protocols
Caregiver	Clinical knowledge and skills Soft skills and compliance Physical and mental condition
Team	Team structure and organization Intra-department professional communication Inter-department professional communication Communication with patients and their families Patient file documentation Support and supervision
Work environment	Physical environment Material and equipment Information systems Workload Turnaround times
Management	Personnel management Staff training and integration Subcontracting management Purchasing management Quality and safety management
Institutional context	Economic and regulatory context National health service executive Clinical negligence scheme for trusts

Figure 1: ultrasound images of the patient showing hydrocephalus

5. Conclusions

Amenorrhea in a patient of childbearing potential undergoing chemotherapy is not automatically chemo-induced amenorrhea, it may be a pregnancy. Chemotherapy can be administered safely during the second and third trimesters of pregnancy with minimal risk to the fetus. Trastuzumab is not recommended during pregnancy. Non-hormonal contraception is preferred for women of childbearing age undergoing chemotherapy.

Competing interests

The authors declare no conflicts of interest.

Authors' contributions

Data collection and analysis: Fatima-Zahra Kahouadji, Saber Boutayeb; redaction of the article: Fatima-Zahra Kahouadji; revision of the article: Fatima-Zahra Kahouadji, Saber Boutayeb, Sihame Lkhoyaali, Amine Benkabbou, Ibrahim El Ghissassi, Hind M'rabti and Hassan Errihani. All authors have read and approved the final version of the manuscript.

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