Stop! Check your initial assumptions
Frozen patient management in obstetrical practice
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Abstract
At times, leaping from one patient management routine to an alternative one may be required to mitigate medical errors. “Frozen patient management” is the resultant situation, when, in the face of an obvious gap between the expected and the actual phenomena, leaping from current patient management to an alternative one is not considered or done. Frozen patient management can lead to a significant delay of the correct definitive intervention, be it surgical or pharmacological. The significance of this delay is especially important in time-dependent dynamic situations. In delivery ward, this may cost the life of either the fetus or the mother.

In this study, we describe a sequence in which frozen patient management occurred in the delivery ward. Using “thinking protocol” (herein termed “de-freezing” questionnaire) made the team stop and consider a leap when gaps became apparent, and saved the mother’s life.

We believe that adopting the “de-freezing questionnaire” as a routine adjunct for all medical activities would lead to a timely change of treatment line, which, in turn, will save lives and unnecessary suffer.

Abbreviations: ALT = alanine transaminase, AST = aspartate transaminase, E3 = estriol, HELLP = hemolysis, elevated liver enzymes, low platelets, MOM = multiples of the median, PET = pre-eclamptic toxemia, PT/PTT = protrombin time/partial thromboplastin time.

Keywords: de-freezing, delivery room, missed diagnosis, patient management, patient safety, stagnant medical treatment

“AT A CARDIAC ARREST, THE FIRST PROCEDURE IS TO TAKE YOUR OWN PULSE”
The House of God

1. Introduction
To err is part of medical reality.[1] To mitigate medical errors, at times, leaping from one patient management routine to an alternative one, may be required.[2,3] Such leaping becomes vital when a gap between the expected and the actual findings appears. In practice, there are too often events during which medical teams fail to do so. “Frozen patient management” is the resultant situation, when, in the face of an obvious gap between the expected and the actual phenomena, leaping from current patient management to a more appropriate one is not considered or done.[2] We have recently formulated a “thinking protocol” (herein termed “de-freezing” questionnaire) that makes medical teams stop and consider a leap when gaps appear (“take your own pulse”).[4]

The de-freezing questionnaire has the following 3 steps:
Step 1: includes gap identification, in which physician identifies if any gap occurred between the expected and the actual physical findings, patient’s reaction, or laboratory results.
Step 2: includes assigning any of the following 4 possible prototypical causes to the gap:
   i. Conceptual cause: The performance of actions under an unfit or incorrect concept, for example, diagnostic error;
   ii. Mistake cause: Simply the case of administering the wrong drug or surgical procedure;
   iii. Underdoing cause: Adding unnecessary elements, for example, giving a patient an unnecessary medication;
   iv. Overdoing cause: The deletion of necessary elements, for example, refraining from the administration of a required medication. Unlike the conceptual cause for a gap, the other 3 occur under the correct diagnosis or treatment plan. To correctly implement the de-freezing questionnaire, it is mandatory that all 4 causes be considered.

Step 3: includes physicians’ response to the gap. This step starts with estimation of the likelihood of each prototypical cause to lead to the specific gap. This estimation is subjective and relies mainly on personal experience and judgment. If the most likely cause is treatment plan concept error or diagnostic error, the physician should consider leaping to an alternative treatment plan or diagnosis. If the most likely cause is mistake cause, overdoing cause, or underdoing cause, the physician should check the actual implementation of the treatment plan.

Having had this conceptual understanding, we encountered a case in which the protocol saved a pregnant woman in the delivery ward. Pre-eclamptic toxemia (PET) is a gestational pathology that involves hypertension and proteinuria during the third trimester of pregnancy. In its extreme form, it may lead to a convulsive state called eclampsia. Another form of severe PET is

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count, elevated liver enzymes, low platelets (HELLP). At times, the appearance of HELLP may be partial and gradual. In the presented case, the patient had a clinical presentation that heralded the appearance of HELLP, but was overlooked.

2. De-freezing implementation

A 28-year-old, otherwise healthy, pregnant woman (gravida 2, para 1) was admitted to the hospital at 32 weeks 5 days of gestation because of epigastric pain and vomiting with no other symptoms. Until this visit, her pregnancy follow-up was normal and included: normal nuchal translucency (1.2 m’, 1:8000), normal anatomical survey at the 15th week, normal integrated test (1:7700, alpha fetoprotein 0.61 multiples of the median [MOM], human chorionic gonadotropin 0.54 MOM, E3 0.84 MOM, pregnancy-associated plasma protein A 0.36 MOM, and free BHCG 0.57 MOM—all within normal limits), normal complementary anatomical survey at 22 weeks, and negative glucose challenge test. Her first pregnancy was unremarkable and she had a normal vaginal delivery at term.

On presentation, her vital signs were normal. Physical examination revealed mild epigastric pain upon palpation with no other findings (ie, a gap, see “Discussion” section). Gynecological examination, including obstetrical ultrasound, was unremarkable. Complete blood count, electrolytes, liver enzymes, and prothrombin time/partial thromboplastin time (PT/PTT) were normal. The patient was examined by an internal medicine specialist, and gastritis was suspected. The day after her hospitalization, her symptoms resolved spontaneously, her vital signs were all normal, and she was discharged from the hospital.

A day after being discharged, the patient was admitted again to the hospital due to the same complaints (ie, a gap, see “Discussion” section). On presentation, her blood pressure was 147/88 (a gap, interpreted as normal) and subjective complaint was taken as an indication for further studies and hospitalization (identification of the gap and initial response, which allows further thinking). Complete blood count revealed normal hemoglobin level (12.1 g/dL), thrombocytopenia 86,000/mL, further elevated liver enzymes (AST 132IU/L), and lactate dehydrogenase (LDH) was also elevated 520U/L. During the few hours after her hospitalization, blood pressure climbed to a maximum of 176/94 among other abnormal values. A follow-up blood test revealed further increase in liver enzymes and LDH.

At this point, the obstetrician who was trained in the de-freezing questionnaire became involved (see Table 1).

| Step 1: included gap identification. The obstetrician identified the following gaps: severe abdominal pain, hypertension, elevated liver enzymes, and thrombocytopenia. |
| Step 2: involves assigning possible prototypical causes to the gap, according to 4 prototypical causes for gaps. For each gap, he followed Table 1, in which he assigned possible prototypical causes to the gap, according to 4 prototypical causes for gaps, and recommended responses to the gap accordingly (step 3). |

Consequently, the diagnosis of PET with HELLP was established. Intravenous magnesium sulfate treatment was started, and an immediate cesarean section was done under general anesthesia (thrombocytopenia did not allow spinal analgesia). A healthy baby girl weighing 1615g was born. Interestingly enough, as she woke up from anesthesia, she hardly complained of postoperative pain and explained that compared with her previous pain, which disappeared completely, the
current pain was nothing. In the days after the delivery, the patient’s blood pressure and laboratory studies spontaneously returned to normal limits, further confirming the diagnosis of PET/HELLP.

Ethical approval was not necessary since we retrospectively analyzed the medical decision-making process of a single case.

3. Discussion

Frozen patient management can lead to a significant delay of the correct definitive intervention, be it surgical or pharmacological. The significance of this delay is especially important in time-dependent dynamic situations. At times, this may cost the life of either the fetus or the mother. In emergency departments, it may lead to a permanent brain damage which could have been prevented or continued fatal bleeding from an internal artery that was not considered. Interestingly enough, working according to protocols, as medical care includes today,[15] is known as increasing the probability of frozen patient care.[13]

In the present case, the first gap was the absence of physical or laboratory support to any pathological process. Had this gap been identified, we do not think it would have propelled different action. However, on the second admission, the mere fact that she chose to come back could have served as a leading gap, which, with proper re-thinking, might have prevented her discharge. On the third admission, not only the repetitive approach could have served as a key gap, but the mildly lowered thrombocyte count could have led to a different approach to the patient, should it had been identified as a gap. On her fourth admission, we were cognizant with the de-freezing approach and applied it to the gap of severe pain with all previous negative findings. The resultant decision to hospitalize and deepen the studies saved the patient from being sent home again and saved unnecessary risk to her health and life.

Medical education and training involves extensive studying of many diagnoses and treatment algorithms, which dictate patient management. Thinking is always focused on junctions where a specific call channels one to take a given future arm of the algorithm. Yet, at no point these algorithms say: “Please, stop, look backwards and verify the correctness of your thinking or actions.” Hence, this attitude is not a front runner of teaching. Emphasizing cases like the one we present, and taking home the lesson, can help changing attitudes among physicians. We believe that adopting the “de-freezing questionnaire” as a routine adjunct for all medical activities would lead to a timely change of treatment line, which in turn will save lives and unnecessary suffer.

4. Conclusions

Ten months later, the sister of the same women came at her 31st week of gestation with the same complaints. Her clinical picture and course with the department was almost identical. When IBS and JS recognized the fact that this is the sister, they trumpeted it. Yet, the department’s head still had to go through an additional work-up, which included a negative gastroscopy, before her thrombocyte count sunk to 84,000/mm³, and persuaded him that she presents an atypical form of HELLP. After cesarean section under general anesthesia, her first awake remark was that the postoperative pain is nothing compared with her previous pain, which has disappeared altogether. We take the response to the sister’s situation as evidence that previous fixed perceptions interfere with the ability to leap to an alternative track.

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