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(CASE REPORT)

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When faced with macrocytic anemia in a pregnant woman, consider a vitamin B12 deficiency: About a case and review of the literature

Fouad Ech chouyekh *, FZ Fdili Alaoui, Sofia Jayi, Yassine Belhaj, Hikmat Chaara and MA Melhouf

Department of Obstetrics Gynecology II, Hassan II university hospital center, Sidi Mohamed Ben Abdellah Faculty, Fes, Morocco.

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Abstract

The demonstration of a macrocytic anemia, especially aregenerative, during pregnancy, especially if associated with other abnormalities of other lineages (white blood cells and platelets) can be severe in pregnant women, hence the need to look for the causal condition which may be a deficiency cause especially in vitamin B12 or other more serious pathology.

We report a case of pan cytopenia of deficiency origin during the 3rd trimester of pregnancy treated in our training.

Pancytopenia of deficiency origin remains exceptional during pregnancy, especially in vitamin B12, and given its hemorrhagic and infectious severity, its discovery requires investigation and vitamin deficiency must be sought, particularly in the face of macrocytic anemia.

Keywords: Macrocytic Anemia; Pancytopenia; Vitamin Deficiency; Pregnancy

1. Introduction

During a pregnancy, the demonstration of pancytopenia should prompt the obstetrician, in consultation with the intensivist, to assess its severity in the pregnant woman and to seek, in consultation with the internist, the causal condition.

It can be the translation of several pathologies, among others, we find acute leukemia, HELLP syndrome, viral and autoimmune causes, vitamin B12 and folic acid deficiency, myelodysplastic syndrome and bone marrow aplasia.

We report a case of pan cytopenia of deficiency origin during the 3rd trimester of pregnancy treated in our training.

2. Clinical case

Mrs. S.M, 32-year-old patient, without notable pathological history, multiparous,carrying a double-scarred uterus, current pregnancy estimated at 33 weeks + 6 days , poorly followed by apparently normal course, in particular no metrorrhagia, no neurosensory signs of hypertension, no hydrorrhea, negative infectious history, until 3 days before admission where the patient presented intense asthenia with edema, aggravated by respiratory difficulty, stage III dyspnea and chest pain associated with cough, motivating the patient to consult a public structure, benefiting from a biological assessment then referred to us due to the discovery of pancytopenia.

* Corresponding author: Fouad Ech chouyekh

Her assessment was: Hemoglobin 3.4 g/dl, leukocytes 2900 elm/mm3, Platelets 87000/mm3. The patient was transfused with 2 packed red blood cells during her transfer.

- Admission examination: finds a conscious, stable, bedridden patient, very asthenic, discolored conjunctiva, Blood Pressure 12/07, Puls 120 bpm, urine strip negative. With a generalized edema and puffiness of the face, bruising of the left thigh without external hemorrhage and on the respiratory level stage III dyspnea with saturation at 99%.
- Obstetrically: Uterine Height corresponding to gestational age, rhythm fetal heart rate was normo-oscillatory and normo-reactive. Patient outside of work.
- Obstetric ultrasound shows a progressive single-fetal pregnancy, satisfactory biometry with estimation of fetal weight at 1850 g, normal uterine and umbilical Doppler.
- An emergency biological assessment confirmed the pancytopenia: Hemoglobin:5 /mm3, leukocytes 3200 /mm3,Platelets: 79000/mm3. The rest of the preeclampsia assessment plus troponin was normal.
- CT angiography performed: to rule out pulmonary embolism given the dyspnea: absence of direct or indirect sign in favor of pulmonary embolism, foci of ground glass involving the two pulmonary hemifields associated with thickening of the peri-lobular septa at the level of the two upper lobes first evoking vascular overload. Bilateral pleural fluid effusion, Left atrium discreetly dilated.
- Cardiac Ultrasound performed showing moderate mitral regurgitation with a rheumatic appearance, normal filling pressures without dilatation of the cavities or pulmonary hypertension.

A diagnostic assessment carried out showing aregenerative macrocytic anemia without schistocytes or blasts on smear, low vitamin B12 and absence of folate blood. The rest of the assessment was normal. The myelogram was referred after delivery.

Faced with this clinical and biological picture, the diagnosis of pancytopenia of deficiency origin was retained.

The decision was to transfuse the patient, followed by folic acid supplementation, and vitamin B12 was established with close maternal and fetal monitoring, as well as increased biological monitoring and transfusion support according to the results in order to prepare the patient for childbirth which will be a planned a cesarean section.

The patient improved clinically, but biological monitoring (table 1) showed a worsening of thrombocytopenia from day to day despite the transfusion of platelet pellets, hence the decision to extract with intraoperative transfusion. The procedure took place without incident with the extraction of a healthy male newborn and the postpartum period was simple. Upon discharge, the patient was referred to an internal medicine consultation for follow-up.

Table 1 Blood count result during the first 5 days

	Admission	**J1**	**J2**	**J3**	**J4**
Hemoglobin	5	5.4	6	5.9	5.3
Platelets	79000	75000	62000	50000	44000
Leukocytes	3000	3300	2340	1970	1390

3. Discussion

Pancytopenia is defined biologically by the combination of the following criteria:

- A hemoglobin (Hb) level < 12g/dl (less than 10.5 in pregnant women)
- A white blood cell (WBC) count < 4000/mm3 with a polymorphonuclear neutrophil (PNN) count < 1500/mm3;
- A platelet count (Plq) < 150,000/mm3.

It is a frequent clinico-biological entity in hematology which can be observed in various situations, can be of central origin by disorder of marrow production (qualitative or quantitative marrow insufficiency) or of peripheral origin (extra marrow destruction or sequestration blood elements) and in other cases it can combine the two mechanisms.

Pancytopenia of deficiency origin is rare during pregnancy, manifested clinically by:

- an anemic syndrome: more or less severe, primarily mucocutaneous pallor, asthenia, the occurrence of dyspnea, palpitations and tachycardia, this syndrome was first described by Addison in 1855, before the appearance of vitamin therapy, these anemias were pernicious because due to extreme asthenia, the patients were confined to bed.

- infectious signs: linked to neutropenia: especially if PNN below 500 elm/mm.
- Hemorrhagic signs: linked to thrombocytopenia.
- Neurological syndrome: neuroanemic syndrome.
- Digestive signs (abdominal pain, dyspepsia, constipation or diarrhea)
- Skin signs: skin hyperpigmentation especially the palmar region.
- Others: subicterus, sometimes moderate splenomegaly.

Biologically

A particularly macrocytic aregenerative anemia associated with leukopenia and thrombocytopenia, and blood smear of large red blood cells and polymorphonuclear cells with giant platelets, these cytological abnormalities result from a defect in DNA replication (which requires folic acid and vitamin B12 which are involved in the synthesis of Thymidine and Methionine), and a delay in nuclear maturation while the cytoplasm undergoes normal maturation, many cells stop in the cell cycle at the S phase. the asynchrony of nucleo-cytoplasmic maturation, the insufficiency of mitoses explain the morphological anomalies generally observed in the marrow. These disorders are responsible for a large ineffective myelopoiesis by intramedullary abortion of immature elements

The myelogram is the basic examination to make the cytological diagnosis which must be carried out during pregnancy if the demonstration of pancytopenia 2, while the vitamin dosage makes it possible to confirm a deficiency in vitamin B12 and folate.

This vitamin deficiency may be due to digestive malabsorption of gastric or intestinal origin dominated by Biermer's disease, or congenital deficiency of intrinsic factor, distal resection of the small intestine, and intake deficiency linked to risk factors described in the literature which are: precariousness, multiple and closely spaced pregnancies as well as malnutrition 1. hence the need to supplement with folic acid as soon as the desire for pregnancy is mentioned by patients.

The socio-economic situation of our patient, who without a profession, was really precarious, and the diet is 100% unbalanced given her habitat which is far away in a region with difficult access.

The treatment is based first, if the values are very low, on the transfusion of red blood cells and platelets with the introduction of vitamin B12 injections according to a given protocol and folic acid supplementation, the blood count normalizes in approximately 2 months except for the Biermer's disease requires lifelong treatment with vitamin B12.

In our case, transfusion support was decided to prepare the patient for childbirth but biological monitoring showed platelet consumption despite the transfusion of platelet pellets, hence the decision for an upper route supervised by platelet transfusions to maintain a rate greater than 50,000, our patient received 8 pellets per procedure which was carried out without hemorrhagic complications.

Within the limits of our knowledge, we report the sixth case of pancytopenia of deficiency origin during pregnancy. Three cases in the United Kingdom, one case in Belgium and one case in France 1, Identically, to our observation the pancytopenia observed during the 3rd trimester in all patients who had the same socioeconomic profile of our patient with the same therapeutic attitude to transfusion and vitamin supplementation while noting the discovery of Biermer's disease in one patient and therefore supplementation for life. On the other hand, unlike our case he had full-term vaginal deliveries, our patient gave birth prematurely vaginally given that she has a doubly scarred uterus and the aforementioned context.

4. Conclusion

Pancytopenia of deficiency origin remains exceptional during pregnancy especially in vitamin B12 while knowing the frequency of folate deficiency in the 3rd trimester especially in the presence of risk factors.

Given the hemorrhagic and infectious severity of pancytopenia, its discovery requires investigation and vitamin deficiency must be sought, particularly in the face of macrocytic anemia.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of ethical approval

The present research work does not contain any studies performed on animals/humans subjects by any of the authors'.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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