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ORIGINAL ARTICLE

Thrombocytopenia in Hypertensive Disease of Pregnancy

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Abstract

Background Thrombocytopenia is defined as a platelet count of less than 150×10^3 μl. It is commonly diagnosed and has attracted more interest from the researchers in pregnant women during the last 20 years, especially in hypertensive pregnant women.

Aim To assess the incidence of thrombocytopenia in hypertensive pregnant women during the third trimester of pregnancy.

Methods Five hundred forty-four pregnant women were included in this study from a total of 10,272 admitted at the Obstetrics and Gynecology Department at Tripoli Medical Center during January–August 2007. Frequent blood pressure monitorings and full blood counts were performed in several medical follow ups. They were not known to be HBV, HCV, or HIV positive women before pregnancy, and none was reported to have evidence of HBV, HCV, or HIV upon performing HBs-Ag, anti-HCV antibody, or HIV-antigen positive tests. Data were arranged in Excel Microsoft program version 2010, and statistically analyzed by SPSS windows program version 17.

Results Five hundred and forty-four women were hypertensive according to WHO hypertension definition criteria. Sixty-seven women had only one reading of high blood pressure, while 39 women fulfilled HELP syndrome criteria (hemolysis elevated liver enzymes low platelet). These 39 women were excluded from the study. Therefore, only 438 pregnant women remained eligible for the study. The mean age was (32.56 ± 1.5), with their ages ranging between 18 and 49 years. Most of the included women were primigravida 179 (39 %), gravid 2, para one were 72 (16.4 %), and the rest were gravid 3 or more (42.6 %). The blood pressure was 140-160/90-110 mmHg in 365 women (83.4 %), and 73 women (16.7 %) had blood pressure readings more than 160/110 mmHg. Mean platelets count was (206.49×10^3/μl ± 3.35), and ranged between ($41.0 - 449.0 \times 10^3$/μl). Thrombocytopenia (less than 150×10^3/μl) was recorded in 103 women (23.5 %). All pregnancy cases were delivered safely with no fetal complications.

Conclusion Gestational thrombocytopenia (GT) is recognized as a major cause of thrombocytopenia particularly in hypertensive pregnant women during the third trimester. Careful follow up during and after pregnancy for those women is recommended.

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Keywords Pregnancy · Thrombocytopenia · Gestational hypertension · Thrombocytopenia

Introduction

Platelets are produced in the bone marrow and remain in blood for about 2 weeks before they are destroyed in the reticuloendothelial system. The normal platelets count ranges between 150 and 450 $\times$ 10^3/μl which is also the same as that is mostly recorded during the normal pregnancy [1, 2].

Gestational thrombocytopenia (GT)—thrombocytopenia during pregnancy (PIT)—occurs in late gestation, and its frequency increases during the last few weeks of gestation, and it occurs also during the last few weeks of the second trimester. PIT is commonly mild (>100 $\times$ 10^3/μl), and resolves usually completely after delivery; however, severe thrombocytopenia (<70 $\times$ 10^3/μl) rarely occurs [3]. Several studies have reported fetal and/or neonatal thrombocytopenia in 4–13 % GT's mothers [4].

During pregnancy, fluid retention occurs because of sodium and water retention under estrogen and progesterone hormone effects, leading to hemodilution. This leads to lower hematocrit (dilution or pseudo-thrombocytopenia). Burrows and Kelton [5] reported that the frequency of PIT was 5 %, while Kaplan et al. [6] observed PIT in about 7 % of pregnancies. This increase was claimed to be related to previously acquired or inherited diseases or pregnancy-related complications such as preeclampsia, sepsis, or pregnancy-induced disseminated intravascular coagulation [6].

The underlying cause of GT cannot usually be identified in about 75 % of the cases. In such cases, GT is generally assumed to be secondary to increased platelet consumption within the placental circulation and/or to hormonal inhibition of megakaryocytopoiesis. This type of thrombocytopenia is known as asymptomatic thrombocytopenia; it, however, does not cause any clinical adverse effects in the mother or the baby [5, 6]. Asymptomatic thrombocytopenia is reported in 5 % of normal pregnancy at preterm, whereas about 15 % of pregnant women develop severe thrombocytopenia if they develop preeclampsia during the last term [5]. Thrombocytopenia occurs more and slightly severer in twin pregnancy than in singleton pregnancy [7].

The criteria to diagnose gestational thrombocytopenia are as follows: platelets count is normal outside pregnancy, occurs late in gestation, no fetal/neonatal thrombocytopenia and complete recovery with normal platelets count, and function after delivery [3]. GT is considered a benign condition during pregnancy, and it does not require greater intensive care than routine obstetrical care [4, 8].

Thrombocytopenia can be due to idiopathic thrombocytopenic purpura (ITP) which is caused mostly because of the formation of autoimmune antibodies. Most of GT manifestations are similar to ITP. Letsky and Greaves [8] reported that differentiating ITP from gestational thrombocytopenia by antibodies immunoassays is difficult, while at least one or two of ITP-induced antibodies are present in PIT [9]. GT is usually not severe and has not significant effect on neonatal thrombocyte count. On the contrary, ITP is usually severe during pregnancy, but it improves after delivery [10] in mothers; and severe thrombocytopenia may occur in about 5–10 % of offspring of the affected mothers [11].

Preeclampsia prevalence is variable, the estimated incidence is 5–10 % of all pregnancies, with a higher incidence in the first pregnancy especially in women aged less than 20 years [11]. The frequency and severity of thrombocytopenia increase with the severity of preeclampsia, and are greater in patients with the HELLP syndrome or in those who have a full-blown eclampsia with disseminated intravascular coagulation [12].

Mangann et al. [13] reported that overall incidence of thrombocytopenia in pregnancy is 8 %. PIT incidence drops to 5.1 %, when obstetric or medical conditions are excluded, and almost three-fourths of all cases are due to PIT. Thrombocytopenia occurs more commonly in patients with eclampsia (30 %) than in patients with both mild and severe forms of preeclampsia (15–18 %). Patients have severe preeclampsia, with 4–12 % of them having criteria for HELLP syndrome, and immune-mediated thrombocytopenia is responsible for 4.1 % of cases, whereas the other causes such as phospholipid syndrome, drugs, etc. constitute the rest[13]. It had been concluded that mild-to-moderate thrombocytopenia in pregnancy is not associated with any adverse effects to the neonates or to the mothers, and no active management is necessary other than periodic monitoring.

In Libya, no study has been conducted to assess the thrombocytopenia during pregnancy especially with high blood pressure during the third trimester. Therefore, this study was planned to investigate this phenomenon in one of the largest obstetric departments in Tripoli.

Methods and Statistical Analysis

Five hundred forty-four pregnant women are included in this retrospective study. The women were under the care of the medical staff of the department of the Obstetrics and Gynecology at Tripoli Medical Center during January–

August 2007. During this period, the total number of admissions of pregnant women in the department was 10,272. Out of those admissions, 544 females had high blood pressure reading during the third trimester, while only 103 women had thrombocytopenia. Blood pressure measurements (once every 2 weeks) and full blood counts during (monthly), renal function, liver function tests, and peripheral blood film were conducted which indicated to help us exclude any known causes of thrombocytopenia such as ITP, HELP syndrome, Leukemia, and/or lympho-proliferative diseases. None of the women was known to be hypertensive before pregnancy, and none was infected with hepatitis B, C, or HIV. Data were arranged and statistically analyzed using SPSS windows program version 17.

Results

Out of the 10,272 admissions, 544 women were hypertensive according to WHO hypertension definition criteria. Out of these 544 women, 67 women had only one reading of high blood pressure, and 39 women satisfactorily fulfilled HELP syndrome criteria. Therefore, only 438 women, who fulfilled the aim of the study, were taken into account to be further evaluated.

Their age ranges between 18 and 49 years with a mean age of (32.56 ± 1.5). Most of the included women were primary gravid 179 (39 %), while 72 (16.4 %) were gravid two, para one and the rest were gravid three or more (42.6 %) (Figs. 1, 2).

The blood pressure was 140-160/90-110 mmHg in 365 women (83.4 %), and only 73 women (16.7 %) had blood pressure readings more than 160/110 mmHg (Fig. 3). Platelets count ranges between (41.0 and 449.0 × 10^3/μl) with a mean count of (206.49 × 10^3/μl ± 3.35). Thrombocytopenia (less than 150 × 10^3/μl) was found in 103 women (23.5 %) (Fig. 4a, b). All cases of pregnancies gave birth safely without massive bleeding, and none babies had any major bleeding complications. All pregnancy cases were delivered safely with no fetal complications.

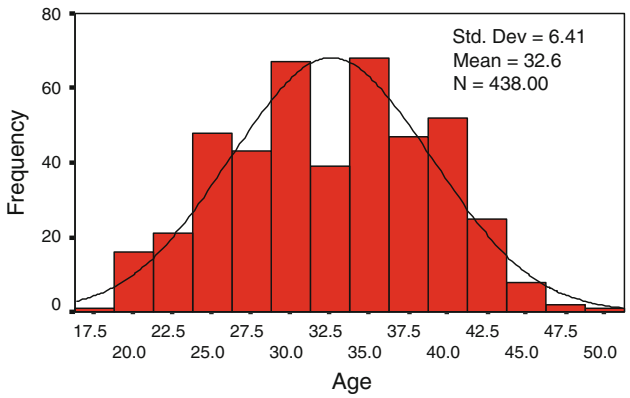

Fig. 1 Women age at pregnancy

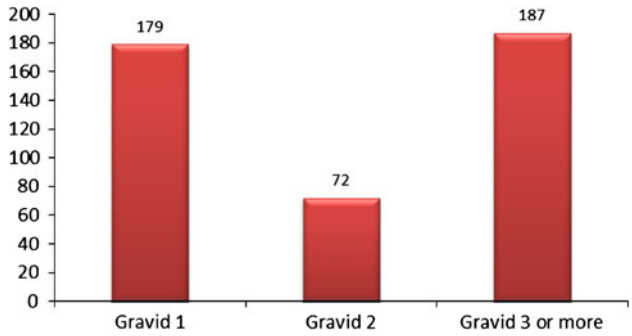

Fig. 2 Number of pregnancies

Discussion

Thrombocytopenia is defined as platelet count being less than 150 × 10^3/μl or platelet count below the 2.5th percentile for pregnant patients. Thrombocytopenia that occurs in pregnant women, who were not known to be previously thrombocytopenic and who had no risk factor for thrombocytopenia, is called PIT.

PIT is classified as mild (platelet count from 100 × 10^3 to 150 × 10^3/μl), moderate (palates 50–100 × 10^3/μl), and severe (<50 × 10^3/μl) [4, 14].

Thrombocytopenia is encountered in 7–8 % of all pregnancies, and 75 % of them is not associated with any underlying cause. Thrombocytopenia during pregnancy may be caused by hemodilution, increased platelet consumption at placental circulation, and increased platelet aggregation due to increased thromboxane A2 levels.

The underlying cause of thrombocytopenia in hypertensive pregnant woman is unknown. Burrows et al. [11] proposed that, in addition to an increased vascular tone during pregnancy, inducing platelet destruction,

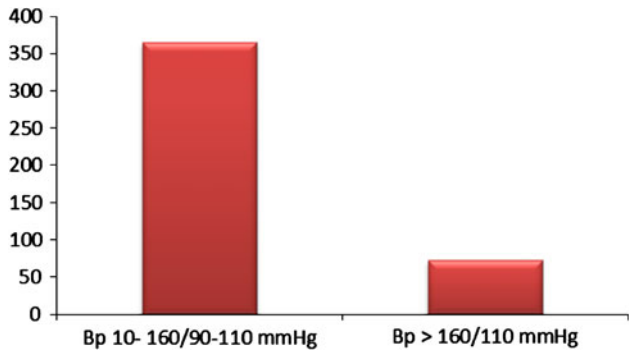

Fig. 3 Arterial blood pressure

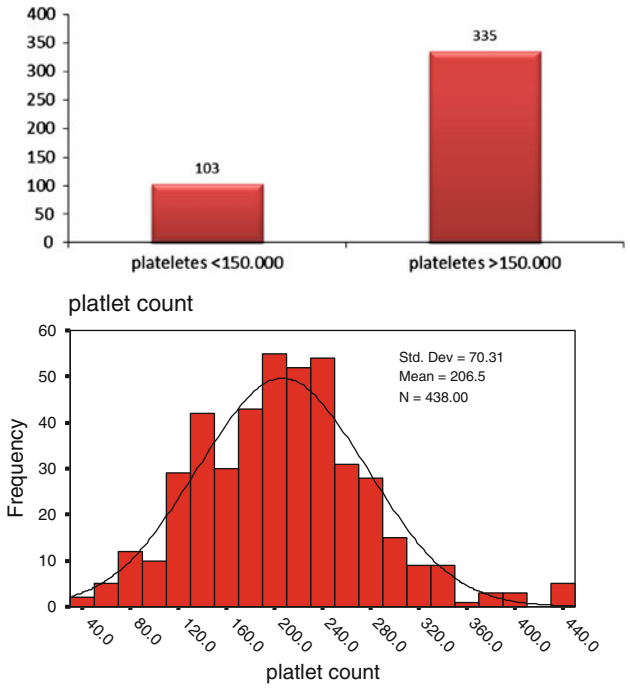

Fig. 4 **a** Platelets count <150 and >150 $\times$ 10^3/μl. **b** Platelets counts frequencies ranges between 40 and 440 $\times$ 10^3/μl

coagulation defects also occur. Some hypertensive pregnant women have an increased platelet-related IgG serum level; however, the increase in immunoglobulin is not specific and does not necessarily indicate an immunologic-mediated thrombocytopenia [5].

In the present study, the women were all hypertensive during the last trimester. Those women who had thrombocyte less than 150 $\times$ 10^3/μl were only about 25 % of the whole group. This is very similar to the previously reported incidences in the earlier studies conducted during this and the previous decade. Only 438 women from the 10,272 women who attended for consultation were thrombocytopenic, and at least once had high blood pressure reading (52.9 %). The women who were hypertensive and had unknown cause of thrombocytopenia in this study were 438 women. Therefore, women were hypertensive and with PIT incidence in this study was 4, 08 %.

Although Jeffrey et al. [14] reported that thrombocytopenia can be a sign of worsened hypertensive disease in pregnant woman, in the present study, there was no worsening of the hypertension control or occurrence of other hypertension complications—for the mothers and the babies; further, we have not lost any baby in these women, even in women who had platelets count as low as 41 $\times$ 10^3/μl.

Previous study by Ajzenberg et al. [15] reported that thrombocytopenia detected during pregnancy did not resolve after delivery in 26 of 47 cases, which may indicate that 55 % of them actually had thrombocytopenia before pregnancy rather than due to PIT. In this study, all the pregnant women were not thrombocytopenic before or after the postpartum period.

In summary, GT is recognized as a cause of thrombocytopenia during pregnancy, but other underlying causes must be considered. Careful history and physical examination are important to exclude other causes. Careful assessment of other parameters of CBC and blood smear should be examined to rule out pancytopenia and pseudo-thrombocytopenia in thrombocytopenic pregnant woman particularly if pregnant and has not had any history of thrombocytopenia before pregnancy. Platelet count >70 $\times$ 10^3/μl during pregnancy indicates more likely to PIT. Normal postnatal maternal platelet count is important to establish the diagnosis of GT. If platelet count falls to less than 50 $\times$ 10^3/μl or if a preexisting history of thrombocytopenia is found to be present, then PIT is unlikely during pregnancy and other causes should be ruled out before coming to any conclusion.

Conclusion

PIT is not a major complication of pregnancy even in hypertensive pregnant women during the third trimester; however, postpartum and during subsequent pregnancies, follow up by obstetrician, physician, and pediatrician is recommended.

References

1. Matthews JH, Benjamin S, Gill DS, et al. Pregnancy-associated thrombocytopenia: Definition, incidence and natural history. Acta Haematol. 1990;84:24.
2. Boehlen F, Hohlfeld P, Extermann P, et al. Platelet count at term pregnancy: a reappraisal of the threshold. Obstet Gynecol. 2000;95:29–33.
3. George JN, Woolf SH, Raskob GE, et al. Idiopathic thrombocytopenic purpura: A practice guideline developed by explicit methods for the American society of haematology. Blood. 1996; 88:3–10.
4. Burrows RF, Kelton JG. Thrombocytopenia at delivery: A prospective survey of 6175 deliveries. Am J Obstet Gynecol. 1990; 162:731–4.
5. Burrows RF, Kelton JG. Fetal thrombocytopenia and its relation to maternal thrombocytopenia. N Engl J Med. 1993;329:1463.
6. Kaplan C, Forestier F, Dreyfus M, et al. Maternal thrombocytopenia during pregnancy: Diagnosis and etiology. Semin Thromb Hemost. 1995;21:85.
7. Tsunoda T, Ohkuchi A, Izumi A, et al. Antithrombin III activity and platelet count are more likely to decrease in twin pregnancies than in singleton pregnancies. Acta Obstet Gynecol Scand. 2002; 81:840.
8. Letsky EA, Greaves M. Guidelines on the investigation and management of thrombocytopenia in pregnancy and neonatal alloimmune thrombocytopenia. Br J Haematol. 1996;95:21.

9. Moise KJ. Autoimmune thrombocytopenic purpura in pregnancy. Clin Obstet Gynecol. 1991;34:51.
10. Burrows RF, Kelton JG. Pregnancy in patients with idiopathic thrombocytopenic purpura: Assessing the risks for the infant at delivery. Obstet Gynecol Surv. 1993;48:781.
11. Saftlas AF, Olson DR, Franks AL, et al. Epidemiology of pre-eclampsia and eclampsia in the United States, 1979–1986. Am J Obstet Gynecol. 1990;163:460.
12. Sibai BM, Ramadan MK, Chari RS, et al. Pregnancies complicated by HELLP syndrome (hemolysis, elevated liver enzymes, and low platelets): Subsequent pregnancy outcome and long-term prognosis. Am J Obstet Gynecol. 1995;172:125.
13. Magann EF, Martin JN Jr. Twelve steps to optimal management of HELLP syndrome. Clin Obstet Gynecol. 1999;42:532–50.
14. Jeffrey AL, Lance DM. Thrombocytopenia in pregnancy. J Am Board Fam Pract. 2002;15:290–7.
15. Ajzenberg N, Dreyfus M, Kaplan C, et al. Pregnancy-associated thrombocytopenia revisited: assessment and follow-up of 50 cases. Blood. 1998;92(12):4573–80.