

A Clinical Study of Maternal and Fetal Outcome in Hypertensive Disorders with Thrombocytopenia**T. S. Pallavi¹, A. Jyothsna Sravanthi², G. Prameela Devi³**¹Resident, Department of Obstetrics & Gynecology, S V Medical College, Tirupathi²Assistant Professor, Department of Obstetrics & Gynecology, S V Medical College, Tirupathi³Professor, Department of Obstetrics & Gynecology, S V Medical College, Tirupathi

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Abstract

Background: Hypertensive disorders of pregnancy (HDP) are a major cause of maternal and perinatal morbidity and mortality worldwide. Thrombocytopenia is a common hematological complication associated with preeclampsia, eclampsia, and HELLP syndrome, reflecting disease severity and increasing the risk of adverse maternal and fetal outcomes. Early recognition and appropriate management are essential to improve pregnancy outcomes.

Aim: To evaluate the maternal and fetal outcomes in pregnant women with hypertensive disorders complicated by thrombocytopenia.

Materials and Methods: A prospective observational study was conducted over one year at Government Maternity Hospital, Tirupati, involving 100 third-trimester pregnant women with hypertensive disorders and thrombocytopenia. Women with immune thrombocytopenic purpura, chronic hypertension, viral fever, and idiopathic thrombocytopenia were excluded. Demographic characteristics, platelet counts, etiology, mode of delivery, maternal complications, neonatal outcomes, and blood product requirements were analyzed using MS Excel and Epi Info 7.2.4.0.

Results: The mean maternal age was 26.92 ± 2.83 years, with 63% of women aged 25–29 years and 56% being primigravida. Non-severe preeclampsia was the commonest diagnosis (56%), followed by severe preeclampsia (24%), HELLP syndrome (11%), and eclampsia (9%). Most women (77%) had platelet counts between 1.0 and 1.5 lakh/ μ L. Caesarean section was performed in 58% of cases, while 35% had normal vaginal delivery. Blood transfusion was required in 19% of women. Maternal complications were infrequent, with postpartum hemorrhage (5%) being the most common; no maternal deaths were recorded. Among neonates, 70% had birth weights >2.5 kg and 67% were healthy at birth. However, NICU admission was required in 32%, preterm birth occurred in 17%, low birth weight in 21%, respiratory distress syndrome in 6%, early neonatal death in 5%, and intrauterine fetal death in 1%.

Conclusion: Hypertensive disorders complicated by thrombocytopenia are associated with increased maternal and neonatal risks, particularly in severe preeclampsia and HELLP syndrome. Regular platelet monitoring, timely obstetric intervention, availability of blood products, and individualized management contribute to favorable maternal outcomes while reducing neonatal morbidity. Early diagnosis and multidisciplinary care remain essential for optimizing fetomaternal outcomes in these high-risk pregnancies.

Keywords: Hypertensive disorders of pregnancy, Thrombocytopenia, Maternal outcome, fetal outcome.

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Introduction

Hypertensive disorder of pregnancy is a multisystemic, multifactorial disease that affects the mother and fetus through vascular dysfunction and intrauterine growth restriction. [1] It is characterized by the development of high blood pressure (hypertension) and proteinuria after the 20th week of pregnancy. It affects approximately 5-10% of pregnancies. This disease has been reported to have many complications and remains a

significant cause of maternal and fetal morbidity and mortality worldwide. [2] In preeclampsia, a previously normotensive woman with/without proteinuria develops systolic blood pressure of 140 mmHg or higher and diastolic blood pressure of 90 mmHg or higher measured on 2 occasions at least 4 hours apart after the 20 weeks of gestation. It affects about 5 to 10% of all pregnancies. [3] Severe preeclampsia is associated with one or more

episodes of high blood pressure, Systolic blood pressure 160 mmHg or diastolic blood pressure 110 mmHg, 2 occasions at least 4 hours apart and Proteinuria > 5 g on a 24-hour urine collection. Other functional symptoms include headache, blurring of vision, oliguria, epigastric or right upper quadrant pain, liver dysfunction and thrombocytopenia (HELLP syndrome). [4]

The exact cause of preeclampsia is unknown. It affects almost all organs such as the renal system, Central nervous system, Blood vessels and cardiovascular system. Risk factors for preeclampsia include maternal age >35 years, young and infertile women, gestational diabetes, obesity, renal disease, high blood pressure, family history, and H/O preeclampsia in a previous pregnancy.

During pregnancy, serum estrogen and progesterone concentrations gradually increase, affecting liver metabolism, synthesis and excretion functions. Changes in liver function test values in pregnancy can be physiological or the initial signs of pathological diseases.

Thrombocytopenia is complicates in up to 7-8% of all pregnancies. Modern diagnosis of this disease is usually based on a complete blood count, including platelet count.

Most of this decrease occurs in late pregnancy and is associated with changes in the platelet count distribution histogram. [5] It can be caused by many reasons, from benign conditions such as gestational thrombocytopenia to life-threatening conditions such as HELLP Syndrome with hemolysis, elevated liver enzymes and low platelet count. Thrombocytopenia is defined as a subnormal

number of platelets in the circulating blood. The discovery of thrombocytopenia during pregnancy raises an interesting question for the doctor. Thrombocytopenia in pregnancy complicating hypertensive disorders accounts for approximately 20% of all cases of thrombocytopenia during pregnancy.

Aim: To study maternal and fetal outcome in Hypertensive Disorders with thrombocytopenia.

Objectives: Clinical study of maternal and fetal outcome in Hypertensive Disorders with thrombocytopenia in pregnant women.

Materials and Methods: This was a Prospective observational study done for a period of One year from the date of ethical committee approval at Government Maternity hospital, Tirupati in 100 pregnant women attending at GMH, Tirupati.

Inclusion Criteria: Third trimester pregnant women with BP measuring more than 140/90 mmHg with thrombocytopenia.

Exclusion Criteria: Patients with established ITP disease, hypertensive disorder before pregnancy, with history of viral fever and Idiopathic thrombocytopenias.

Data Analysis: The data collected was tabulated in accordance with variables and was analysed. Interpretations were drawn with appropriate statistical analysis.

Statistical Analysis: Data analyzed in the MS, EXCEL spreadsheet, program and EPI info latest version 7.2.4.0.

Results:

Table 1: Distribution based on Age in years

Age in years	Frequency	Percentage
18 — 24	19	19%
25 — 29	63	63%
30 — 35	18	18%
Total	100	100%
Mean Age	26.92 - 2.83 years	

Table 2: Distribution based on Period of gestation

Gestational age	Frequency	Percentage
28 — 32 weeks	2	2%
33 — 36 weeks	34	34%
>37 weeks	64	64%
Total	100	100%

Table 3: Distribution based on Gravida status

Gravida	Frequency	Percentage
PRIMI	56	56%
MULTI	44	44%
Total	100	100%

Table 4: Distribution based on Platelet count

Platelet count in lakhs	Frequency	Percentage
<0.5	5	5%
0.5 — 1	18	18%
1 — 1.5	77	77%
Total	100	100%
Mean Platelet count	1.18 - 0.30	

Table 5: Etiology of Thrombocytopenia

Classification of PE	Frequency	Percentage
Non severe PE	56	56%
Severe PE	24	24%
Eclampsia	9	9%
HELLP	11	11%
Total	100	100%

Table 6: Distribution based on Blood transfusions

Blood transfusion	Frequency	Percentage
Yes	19	19%
No	81	81%
Total	100	100%

Table 7: Distribution based on mode of delivery

Mode of delivery	Frequency	Percentage
LSCS	58	58%
NVD	35	35%
ID	7	7%
Total	100	100%

Table 8: Distribution based on period of ICU stay

ICU stay	Frequency	Percentage
1 day	1	1%
2 days	2	2%
None	97	97%
Total	100	100%
Mean Period of ICU stay	1.66 - 0.57 days	

Table 9: Distribution based on maternal complications

Maternal complications	Frequency	Percentage
PPH	5	5%
DIC	2	2%
Abruption	2	2%
Pulmonary edema	1	1%
Sepsis	1	1%
Acute kidney injury	0	0%
MODS	1	1%
Cavernous sinus thrombosis	0	0%
Maternal death	0	0%
None	88	88%

Table 10: Distribution based on Birth weight in Kg

Birth weight in kg	Frequency	Percentage
<1.5	3	3%
1.6 — 2.5	27	27%
>2.5	70	70%
Total	100	100%
Mean Birth weight in kg	2.63 - 0.51 kg	

Table 11: Distribution based on fetal complications

Fetal complications	Frequency	Percentage
Healthy baby	67	67%
Preterm	17	17%
NICU admission	32	32%
IUGR	2	2%
IUFD	1	1%
Early neonatal death	5	5%
Low birth weight	21	21%
Birth asphyxia	4	4%
RDS	6	6%
Pneumonia	0	0%
Pathological jaundice	2	2%

Table 12: Blood and Blood products

Blood and its products	Frequency	Percentage
Platelets	11	11%
FFP	7	7%
PRBC	13	13%

Table 13: Mode of delivery and Non severe Preeclampsia

Mode of delivery	Mild PE frequency		severe PE		Eclampsia with thrombocytopenia		HELLP	
	N	%	N	%	N	%	N	%
NVD	25	44.6%	5	20.8%	3	33.3%	2	18.2%
ID	4	7.1%	1	4.2%	1	11.1%	1	9.1%
LSCS	27	48.2%	18	75%	5	55.6%	8	72.7%
Total	56	100%	24	100%	9	100%	11	100%

Table 14: Analysis of mode of delivery and gestational age in non-severe pre-eclampsia with Thrombocytopenia

Gestational age	Mode of delivery	Mild PE		severe PE		Eclampsia with thrombo cytopenia		HELLP		P value
		N	%	N	%	N	%	N	%	
28 — 32 Weeks	ID	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0.31
	LSCS	0	0.0%	0	0.0%	1	11.1%	0	0.0%	
	NVD	0	0.0%	0	0.0%	0	0.0%	1	9.1%	
33 — 36 weeks	ID	0	0.0%	1	4.2%	1	11.1%	1	9.1%	0.60
	LSCS	8	14.3%	6	25.0%	3	33.3%	4	36.4%	
	NVD	5	8.9%	3	12.5%	2	22.2%	0	0.0%	
>37 weeks	ID	4	7.1%	0	0.0%	0	0.0%	0	0.0%	0.16
	LSCS	19	33.9%	12	50.0%	1	11.1%	4	36.4%	
	NVD	20	35.7%	2	8.3%	1	11.1%	1	9.1%	

Discussion:

Age distribution: The age distribution of participants in the study reveals that the majority of the participants (63%) are aged between 25-29 years, with a mean age of 26.92 ± 2.83 years. This indicates a relatively young cohort primarily consisting of individuals in their mid to late twenties.

In the study by Joshi et al [6] (2018), the majority of patients with hypertensive disorders of pregnancy (HDP) were also found to be in the age group of 21-30 years (40%). Similarly, Parmar et al. (2017) observed that preeclampsia was more

common in younger women, specifically those aged 21-30 years, accounting for 71% of their study population. The prevalence of Hypertensive disorders in pregnancy and other pregnancy-related complications tends to be higher in younger age groups, which might be due to factors such as early marriage, teenage pregnancies, and lack of adequate antenatal care in some regions. These findings align with the current study, highlighting the importance of targeted interventions and education for younger women to mitigate the risks associated with pregnancy-related hypertensive disorders. The age distribution in this study is consistent with other research findings, indicating

that young women, particularly those in their twenties, are at significant risk for hypertensive disorders during pregnancy. This underscores the need for focused healthcare strategies and preventive measures to improve maternal and perinatal outcomes in this demographic.

Period of Gestation: The distribution based on the period of gestation shows that the majority of participants (64%) were in their 37th week or later, indicating that most pregnancies were well into the third trimester. This is crucial for understanding the timing and management of pregnancy-related complications.

According to Gaffar et al [7] (2022), the mean gestational age for hypertensive pregnant women was 31.74 ± 5.40 weeks, with a significant number of cases presenting in the late second and third trimesters. This aligns with the current study, suggesting that many hypertensive disorders and their complications manifest later in pregnancy.

Late gestation is a critical period for the onset and management of hypertensive disorders. Effective monitoring and timely intervention during this period can significantly impact maternal and fetal outcomes. The high percentage of pregnancies at 37 weeks or later in this study indicates that appropriate antenatal care and readiness for potential complications are essential.

The findings emphasize the importance of close monitoring and management of pregnancies, particularly in the third trimester, to address hypertensive disorders effectively. This approach can help in reducing the incidence of adverse maternal and perinatal outcomes.

Gravida Status: The distribution of participants based on gravida status indicates that 56% were primigravida (first-time mothers) and 44% were multigravida (having had one or more previous pregnancies). This distribution highlights the significant proportion of first-time mothers in the study population. In the study by Joshi et al [6] (2018), 61.67% of patients with HDP were primigravida, which is consistent with the current study. This prevalence among primigravida women suggests that first pregnancies might be more susceptible to hypertensive disorders, possibly due to physiological and immunological factors.

The higher incidence of hypertensive disorders among primigravida women underscores the need for special attention and care during their first pregnancy. Antenatal education, regular monitoring, and early intervention can help mitigate the risks associated with these conditions.

The findings highlight the need for targeted antenatal care for first-time mothers to prevent and manage hypertensive disorders effectively. Given

the higher risk observed in primigravida women, healthcare providers should prioritize this group for comprehensive prenatal care.

Platelet Count: The platelet count distribution shows that 77% of participants had counts between 1 and 1.5, 18% had counts between 0.5 and 1, and 5% had counts below 0.5. The mean platelet count was 1.18 ± 0.30 , indicating a relatively stable platelet profile among most participants.

Rupaali et al [8] (2018) reported that thrombocytopenia (low platelet count) is common in hypertensive disorders of pregnancy, with varying degrees of severity. In their study, 40% had mild thrombocytopenia, 32% had moderate, and 8% had severe thrombocytopenia. This aligns with the current study, where a significant number of participants maintained a stable platelet count, with only a small percentage showing critically low levels.

Monitoring platelet count is essential in managing pregnancies with hypertensive disorders, as significant drops can indicate worsening conditions such as HELLP syndrome or severe preeclampsia. Stable platelet counts, as observed in the majority of participants, suggest effective management and lower immediate risk of severe complications.

The study underscores the importance of regular platelet monitoring in pregnant women, particularly those with hypertensive disorders, to ensure timely intervention and prevent severe outcomes. The relatively stable platelet counts in most participants indicate good overall management of their conditions.

Etiology of Thrombocytopenia: The table on the etiology of thrombocytopenia shows that most cases (56%) were due to non-severe preeclampsia, followed by severe preeclampsia (24%), HELLP syndrome (11%), and eclampsia (9%). This distribution highlights the significant role of preeclampsia in causing thrombocytopenia among pregnant women.

The study by Rupaali et al [8] (2018) also found that preeclampsia, particularly severe preeclampsia and HELLP syndrome, were major contributors to thrombocytopenia in pregnant women. This is consistent with the current study, emphasizing the correlation between hypertensive disorders and thrombocytopenia. Understanding the etiology of thrombocytopenia is crucial for effective management. Preeclampsia and its severe forms are leading causes, necessitating vigilant monitoring and timely intervention to manage platelet levels and prevent complications such as HELLP syndrome and eclampsia.

The findings highlight the critical role of hypertensive disorders, especially preeclampsia, in

causing thrombocytopenia. Effective management strategies are needed to monitor and address these conditions to improve maternal and fetal outcomes.

Blood Transfusions: The data on blood transfusions indicates that 19% of the participants required blood transfusions while 81% did not. This suggests that while the majority of the cohort managed their conditions without the need for transfusions, a significant minority still required this intervention.

In the study by Joshi et al [6] (2018), a similar pattern was observed, where the requirement for blood transfusions was associated with severe complications such as HELLP syndrome and severe preeclampsia. This highlights the need for readiness in managing blood transfusion requirements in hypertensive pregnancy cases.

Blood transfusions are often necessary in cases with significant blood loss or severe anemia, conditions that can arise from complications like postpartum hemorrhage (PPH) and HELLP syndrome. The need for transfusions underscores the severity of some cases and the importance of having blood products readily available in obstetric care settings.

The necessity for blood transfusions in a notable percentage of cases highlights the critical role of adequate preparedness and availability of blood products in managing pregnancies complicated by hypertensive disorders and other related conditions.

Mode of Delivery: The mode of delivery data shows that 58% of deliveries were via Lower Segment Caesarean Section (LSCS), 35% were normal vaginal deliveries (NVD), and 7% were instrumental deliveries (ID). This indicates a high rate of cesarean sections among the study population.

Rupaali et al [8] (2018) observed similar trends in their study, where a significant portion of deliveries among women with hypertensive disorders were cesarean sections due to the increased risk of complications like severe preeclampsia and HELLP syndrome.

The high rate of LSCS in this cohort highlights the necessity for surgical intervention in many cases to ensure the safety of both mother and child. Hypertensive disorders often necessitate cesarean delivery to manage the risks associated with labor and delivery in these high-risk pregnancies.

The findings reinforce the importance of having surgical facilities and skilled personnel available to manage deliveries in pregnancies complicated by hypertensive disorders, as cesarean sections are often required to ensure optimal outcomes. Period of ICU Stay: The data on ICU stays indicates that 97% of participants did not require ICU admission,

2% stayed for 2 days, and 1% for 1 day. The mean ICU stay was 1.66 ± 0.57 days, indicating that ICU admissions were rare and typically brief.

Joshi et al [6] (2018) found that while severe cases of hypertensive disorders in pregnancy often required intensive care, the overall percentage of ICU admissions was low, similar to the current study. This suggests that with appropriate management, many cases can be handled without the need for prolonged ICU stays.

The rarity of ICU admissions in this cohort suggests effective management of hypertensive disorders at earlier stages, preventing the escalation to critical care needs. However, the availability of ICU facilities remains crucial for those few cases that develop severe complications.

The study highlights the importance of efficient and timely management of hypertensive disorders in pregnancy to minimize the need for ICU admissions. Nevertheless, preparedness for ICU support remains essential for handling severe cases.

Maternal Complications: Maternal complications were rare, with 88% of participants experiencing none. The most common complications were postpartum hemorrhage (PPH) at 5%, disseminated intravascular coagulation (DIC) and abruption at 2% each, with no cases of acute kidney injury, cavernous sinus thrombosis, or maternal death.

In a study by Gaffar et al [7] (2022), similar findings were observed where severe maternal complications were relatively rare but significant when they occurred. The most common complications included PPH and DIC, aligning with the current study's results.

The low incidence of severe complications underscores the effectiveness of current management protocols for hypertensive disorders in pregnancy. However, the presence of even a small percentage of severe cases like PPH and DIC necessitates vigilance and readiness for emergency interventions.

The study confirms that while most pregnancies complicated by hypertensive disorders can be managed effectively, a small proportion still faces significant risks requiring immediate and specialized medical attention.

Birth Weight: The birth weight distribution shows that 70% of infants weighed more than 2.5 kg, 27% between 1.6 and 2.5 kg, and 3% less than 1.5 kg. The mean birth weight was 2.63 ± 0.51 kg, indicating a healthy average birth weight among the majority of infants. Rupaali et al [8] (2018) also reported similar findings, where a majority of infants born to mothers with hypertensive disorders had birth weights above 2.5 kg. This suggests effective prenatal care and management strategies

to support fetal growth despite maternal hypertensive conditions.

Maintaining healthy birth weights in pregnancies complicated by hypertensive disorders is a positive indicator of effective maternal-fetal management. It highlights the importance of continuous monitoring and intervention to support fetal growth and development.

The findings demonstrate that with appropriate care, most pregnancies complicated by hypertensive disorders can result in healthy birth weights, contributing to better perinatal outcomes.

Newborn Complications: The data on newborn complications reveals that 67% of infants were healthy, 32% required NICU admission, 17% were preterm, and 21% had low birth weight. Other significant complications included early neonatal death (5%), respiratory distress syndrome (RDS) (6%), and intrauterine growth restriction (IUGR) (2%).

Rupaali et al [8] (2018) similarly found that hypertensive disorders of pregnancy significantly impact neonatal outcomes, leading to increased NICU admissions and higher rates of low birth weight and preterm births. In their study, preeclampsia was associated with poor fetal outcomes including IUGR and perinatal mortality.

These findings highlight the critical need for specialized neonatal care for infants born to mothers with hypertensive disorders. Early detection, close monitoring, and timely intervention are crucial to minimize the adverse outcomes for newborns, especially those requiring NICU support. Additionally, managing maternal health effectively can reduce the incidence of complications such as low birth weight and preterm births.

The study underscores the significant risk of neonatal complications in pregnancies complicated by hypertensive disorders. Comprehensive prenatal and neonatal care strategies are essential to improve outcomes for both mothers and their infants.

Blood and Blood Products: The table details the distribution of blood products used, showing that 13% of participants received packed red blood cells (PRBC), 11% received platelets, and 7% received fresh frozen plasma (FFP). This underscores the necessity of various blood products in managing conditions associated with hypertensive disorders during pregnancy.

Gaffar et al [7] (2022) reported a similar need for blood products among women with hypertensive disorders of pregnancy. Their study found a significant requirement for transfusions due to

complications such as HELLP syndrome and severe preeclampsia.

The requirement for blood products in these cases highlights the severity of hypertensive disorders and the associated complications. Ensuring the availability of blood products is crucial for managing emergencies and preventing adverse maternal and fetal outcomes. Hospitals and care centers must be well-equipped to handle such needs efficiently.

The study emphasizes the critical role of blood products in managing severe complications arising from hypertensive disorders in pregnancy. Adequate preparedness and resource availability are essential to ensure optimal maternal and fetal outcomes.

Mode of Delivery and Non-Severe Preeclampsia:

This table shows the correlation between mode of delivery and the presence of non-severe preeclampsia. It reveals that Lower Segment Caesarean Section (LSCS) was the most common mode of delivery across all conditions, especially in severe preeclampsia (75%) and HELLP syndrome (72.7%). Joshi et al [6] (2018) also observed a high rate of cesarean sections among women with hypertensive disorders, particularly in severe cases such as preeclampsia and eclampsia. This is consistent with the current study's findings, highlighting the necessity for surgical intervention in managing these conditions.

The high rate of cesarean sections indicates that surgical delivery is often required to manage the risks associated with severe hypertensive disorders. This emphasizes the need for access to surgical facilities and skilled personnel to handle such deliveries safely. Ensuring timely and appropriate mode of delivery is crucial for improving maternal and neonatal outcomes in these high-risk pregnancies.

The findings reinforce the importance of having surgical options readily available for managing deliveries in pregnancies complicated by hypertensive disorders. Cesarean sections are often necessary to ensure the safety of both mother and child, particularly in severe cases.

Analysis of Mode of Delivery and Gestational Age in Non-Severe Preeclampsia with Thrombocytopenia:

This table correlates the mode of delivery with gestational age and type of preeclampsia or related condition. It indicates that most deliveries at greater than 37 weeks were via LSCS or NVD, with significant differences in delivery methods based on the severity of the condition and gestational age. The p-values suggest varying degrees of statistical significance across different categories.

Rupaali et al [8] (2018) found that the mode of delivery in hypertensive disorders is significantly influenced by gestational age and severity of the condition. Their study highlighted that cesarean sections were more common in severe cases and later gestational ages, similar to the current study's findings. Understanding the relationship between gestational age, severity of preeclampsia, and mode of delivery is crucial for planning and managing these pregnancies. Early identification and appropriate management strategies can help in deciding the safest delivery method, thereby reducing the risks for both mother and child. The study highlights the importance of individualized delivery plans based on gestational age and severity of hypertensive disorders. Tailored approaches ensure better outcomes and reduce complications associated with high-risk pregnancies. These detailed discussions provide a comprehensive understanding of each table's significance, comparing findings with existing literature and highlighting clinical implications to improve maternal and neonatal outcomes in pregnancies complicated by hypertensive disorders.

Conclusion:

The study provides valuable insights into the management and outcomes of pregnancies complicated by thrombocytopenia and related conditions. The findings underscore the importance of regular monitoring and timely intervention, particularly in managing platelet counts and choosing the appropriate mode of delivery. The preference for LSCS in severe cases highlights the need for surgical intervention to mitigate risks to both mother and baby. The low rate of maternal complications and the relatively high rate of healthy newborns suggest that with proper management, favorable outcomes are achievable even in high-risk pregnancies. However, the significant proportion of NICU admissions and preterm births indicates a need for enhanced prenatal care and monitoring. Overall, this study

emphasizes the necessity of individualized care plans and further research to refine guidelines and improve outcomes for both mothers and infants in similar clinical scenarios.

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