International Journal of Research in Medical Sciences
Ranjandriarison DT et al. Int J Res Med Sci. 2025 Dec;13(12):5184-5189
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20253940

Original Research Article

Retroplacental hematoma: epidemiological profile and associated risk factors among Malagasy women at the Soavinandriana Hospital Center (CENHOSOA)

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Received: 11 October 2025
Accepted: 14 November 2025

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ABSTRACT

Background: Retroplacental hematoma (RPH) is a severe obstetric emergency that increases maternal and fetal morbidity and mortality. Data on RPH remain scarce in Madagascar. This study aimed to determine its prevalence and identify associated risk factors.
Methods: A descriptive and analytical case–control study was conducted in the Department of Obstetrics and Gynecology, Soavinandriana Hospital Center (CENHOSOA), Antananarivo, from January 2020 to December 2024. Sixty RPH cases and 120 controls (2:1 ratio) were analyzed. Data were retrospectively collected from medical records and analyzed using Epi Info 7.2. Associations were assessed using odds ratios (OR) with 95% confidence intervals (CI).
Results: Among 5,921 deliveries, 60 cases of RPH were identified (prevalence 1.01%). The mean age was 28.7 years (17-40). Farming was significantly associated with RPH (p=0.001; OR=5.75; 95% CI: 1.92-17.21). Lack of antenatal care (p=0.001; OR=6.51; 95% CI: 1.97-21.44), hypertension/preeclampsia (p=0.000; OR=5.68; 95% CI: 2.8-11.5), and abdominal massage during pregnancy (p=0.000; OR=13.57; 95% CI: 5.15-35.73) were major risk factors. Preterm delivery (<37 weeks) was significantly related to RPH (p=0.000; OR=7.97; 95% CI: 3.91-16.25). Cesarean section was required in 83.3% of cases (p=0.000; OR=23.57; 95% CI: 10.31-53.85).
Conclusions: RPH prevalence in this study was higher than reported in other regions. The main risk factors were abdominal massage, hypertensive disorders, absence of antenatal care, and low socioeconomic status. Strengthening antenatal follow-up and discouraging harmful traditional practices may reduce RPH-related complications.

Keywords: Abdominal massage, Antenatal care, Hypertension, Madagascar, Preeclampsia, Retroplacental hematoma, Risk factors

INTRODUCTION

Retroplacental hematoma (RPH), formerly called premature detachment of a normally inserted placenta (DPPNI), is a hematoma caused by partial or total placental separation after 20 weeks of amenorrhea and before delivery.[1-4] Though rare, it is a major obstetric emergency, increasing maternal and neonatal morbidity and mortality.[1,4-6] Its pathophysiology remains unclear.[1,4-8]

RPH affects about 0.3-1% of pregnancies, including 0.38-1% of singleton and 1-2% of twin gestations.[1,4,5,9,10] Its prevalence varies by region and is higher in developed countries (4-6%), where it causes around 10% of perinatal deaths.[6,5,7,11,12] This difference may reflect variations in

risk factors.[3,7] Over 50 factors have been reported, mainly hypertension, preeclampsia, premature membrane rupture, prior RPH or cesarean section, advanced maternal age, multigravidity, trauma, smoking, and alcohol.[1,3-9,11-13] However, RPH may occur without known risk factors.[6]

In Madagascar, data on RPH are limited and not nationally representative. Razafimandimby AJR, in Madagascar, 2009, reported a 0.34% prevalence, and Rakotozanany et al, in Madagascar, 2017, reported 0.59%, both at the University Hospital of Obstetrics and Gynecology, Befelatanana, Antananarivo.[13,14] The main risk factors were poor prenatal care and hypertension.[14,15]

Given these gaps, this study aimed to update epidemiological data and identify key risk factors for RPH among pregnant women at the Soavinandriana Hospital Center (CENHOSOA) over a five-year period.

METHODS

Study design and setting

A descriptive and analytical case-control study was conducted in the Department of Obstetrics and Gynecology, Soavinandriana Hospital Center (CENHOSOA), Antananarivo, Madagascar, from 1st January, 2020 to 31st December, 2025.

Study population

The study included pregnant women admitted to the department with known pregnancy outcomes and a gestational age ≥24 weeks.

Case and control definition

Cases were women with clinically or ultrasonographically suspected RPH, confirmed after delivery by macroscopic placental examination. Controls were women who did not present RPH and delivered immediately before or after a case in the same unit. Sampling was exhaustive, using a 2:1 control-to-case ratio, with a total of 60 cases and 120 controls included.

Exclusion criteria

Excluded were women with marginal hematoma, RPH delivered at home or in another facility, unknown pregnancy outcomes, or RPH before 24 weeks of gestation.

Data collection and analysis

Data were collected retrospectively from medical records, partograms, and operative reports using a structured form. Variables were expressed as frequencies, percentages, and means. Analysis was performed using Microsoft Excel 2010 and Epi Info 7.2.

The variables analyzed included RPH frequency, sociodemographic data (age, occupation, gravidity, parity, obstetric history, and lifestyle), as well as pregnancy characteristics such as antenatal visits, complications, intercurrent events, and gestational age at delivery

Ethical considerations

Patient confidentiality was strictly maintained. Informed consent for research use of clinical data was considered granted through standard care procedures. Institutional approval was obtained from hospital and departmental authorities prior to data collection.

RESULTS

During the five-year study period (January 2020-December 2024), 60 RPH cases and 120 controls were identified among 5,921 deliveries, corresponding to a prevalence of 1.01%. The mean maternal age was 28.7 years (range 17-40); most cases were aged 20-29 years (55%), followed by 30-39 years (36.7%), with no significant age difference. Housewives (43%) and farmers (20%) were the most frequent occupations, and farming was significantly associated with RPH (p=0.001; OR=5.75; 95% CI: 1.92-17.21) (Table 1).

Table 1: Characteristics and medical history of the study population.

Risk factors	Cases N (%)	Controls N (%)	P value	OR (95% CI)
Age group (years)				
15-19	4 (6.67)	15 (12.51)	0.35	0.50 (0.15-1.57)
20-29	33 (55.00)	64 (53.34)	0.97	1.06 (0.57-2.00)
30-39	22 (36.66)	34 (28.32)	0.33	1.46 (0.75-2.82)
≥40	1 (1.67)	7 (5.83)	0.37	0.27 (0.03-2.27)
Occupation				
Civil servant	8 (13.33)	18 (15.00)	0.94	0.87 (0.35-2.13)
Vendor	11 (18.33)	14 (11.67)	0.32	1.69 (0.71-4.01)
Housewife	26 (43.33)	76 (63.33)	0.01	0.44 (0.23-0.83)
Student/pupil	2 (3.33)	3 (2.50)	1.00	1.34 (0.21-8.27)

Continued.

Risk factors	Cases N (%)	Controls N (%)	P value	OR (95% CI)
Farmer	12 (20.00)	5 (4.17)	0.001	5.75 (1.92-17.21)
Others	1 (1.17)	4 (3.33)	0.87	0.49 (0.05-4.49)
Obstetric history				
Gravidity				
Primigravida	7 (6.67)	20 (16.67)	0.51	0.66 (0.26-1.66)
Paucigravida	28 (46.66)	65 (54.17)	0.43	0.74 (0.39-1.37)
Multigravida	15 (25.00)	24 (20.00)	0.56	1.33 (0.63-2.78)
Grand multigravida	10 (16.67)	11 (9.16)	0.22	1.98 (0.79-4.97)
Parity				
Nulliparous	1 (1.67)	0 (0.00)	–	–
Primiparous	15 (25.00)	38 (31.67)	0.45	0.71 (0.35-1.44)
Pauciparous	28 (46.67)	61 (50.83)	0.71	0.84 (0.45-1.57)
Multiparous	9 (15.00)	15 (11.66)	0.69	1.33 (0.54-3.29)
Grand multiparous	7 (11.66)	7 (5.84)	0.28	2.13 (0.71-6.38)
Lifestyle habits				
Alcohol use	2 (3.33)	5 (4.67)	1.00	0.79 (0.14-4.21)
Tobacco use	1 (1.67)	2 (1.67)	1.00	1.00 (0.08-11.25)
Medical history				
History of abortion	29 (48.33)	48 (40.00)	0.37	1.40 (0.75-2.56)
Placental abruption (HRP)	1 (1.67)	0 (0.00)	-	-
Intrauterine fetal death (IUFD)	3 (5.00)	3 (2.50)	0.66	2.05 (0.40-10.50)
Caesarean section	3 (5.00)	7 (5.83)	1.00	0.84 (0.21-3.40)

IUFD: intrauterine fetal death; HRP: haemorrhage due to retroplacental hematoma

Table 2: Course of pregnancy.

Risk factors	Cases (n=60) N (%)	Controls (n=120) N (%)	P value	OR (95% CI)
Number of antenatal care (ANC) visits				
None	11 (18.33)	4 (3.33)	0.001	6.51 (1.97-21.44)
1-3 visits	20 (33.33)	29 (24.17)	0.26	1.56 (0.79-3.10)
≥ 4 visits	29 (48.34)	87 (72.50)	0.002	0.35 (0.18-0.67)
Complications and intercurrent events				
None	25 (41.67)	94 (78.33)	<0.001	0.19 (0.10-0.38)
Chronic hypertension	1 (1.67)	1 (0.83)	1.00	2.01 (0.12-32.81)
Gestational hypertension / preeclampsia	31 (51.66)	19 (15.83)	<0.001	5.68 (2.80-11.49)
Superimposed preeclampsia	1 (1.67)	0 (0.00)	-	-
Eclampsia	0 (0.00)	1 (0.83)	-	-
Trauma	2 (3.33)	0 (0.00)	-	-
Others (UTI/genital infections)	1 (1.67)	5 (4.17)	0.60	0.39 (0.04-3.47)
Abdominal massage	25 (41.67)	6 (5.00)	<0.001	13.57 (5.15-35.73)
Gestational age (weeks of amenorrhea)				
< 37 weeks	36 (59.9)	19 (15.82)	<0.001	7.97 (3.91-16.25)
37-42 weeks	24 (40.01)	98 (81.68)	<0.001	0.14 (0.07-0.29)
> 42 weeks	0 (0.00)	3 (2.50)	-	-
Mode of delivery				
Vaginal delivery	10 (16.67)	99 (82.50)	<0.001	0.04 (0.01-0.09)
Caesarean section	50 (83.33)	21 (17.50)	<0.001	23.57 (10.31-53.85)

ANC: antenatal care; HTAG: gestational hypertension; SA: weeks of amenorrhea; UTI: urinary tract infection

Regarding obstetric history, paucigravida (46.7%) and pauciparous (46.7%) women were predominant. Gravidity and parity showed no significant association with RPH. Previous abortions (48%), smoking, and alcohol use were not related to RPH occurrence (Table 1).

Almost half of the women (48.3%) attended at least four antenatal visits, while the absence of antenatal care was strongly linked to RPH (p=0.001; OR=6.51; 95% CI: 1.97-21.44). Gestational hypertension and preeclampsia were reported in 51.7% of cases. Abdominal massage during pregnancy was noted in 41.7%, and both factors were significantly associated with RPH (p=0.000; OR=5.68; 95% CI: 2.8-11.5 and OR=13.57; 95% CI: 5.15-35.73) (Table 2).

Among deliveries, 36 cases (60%) were preterm (<37 weeks) and 24 (40%) occurred at term, with preterm birth significantly associated with RPH (p=0.000; OR=7.97; 95% CI: 3.91-16.25). Caesarean section was performed in 83.3% of RPH cases, also showing a significant association (p=0.000; OR=23.57; 95% CI: 10.31-53.85) (Table 2).

DISCUSSION

The prevalence of RPH varies across regions and populations.[11] In this study, the prevalence (1.01%) was higher than most reports in the literature. Shabnam et al, in Dubai, 2019, reported 0.61% over five years (2013-2017); Kyozuka et al, in Japan, 2020, found 0.44% in a 2011-2014 cohort; Schur et al, in Israel, 2022, reported 0.73%; Li et al, in China, 2012, 0.29%; and Shen et al, in the USA, 2008, 0.76%.[5,7,11,12,16] Such variation may reflect differences in diagnostic methods, case definitions, follow-up protocols, and population risk profiles.[6,11,12] The relatively high prevalence observed here may therefore indicate specific risk factors within the Malagasy population.

Most women in this study were young, mainly aged 20-29 years, similar to findings by Saquib et al, in Dubai, 2020 (20-34 years), and Kyozuka et al, in Japan, 2021 (25-34 years).[5,11] Shen et al, in the USA, also reported predominance among women aged 20-35 years. The mean age in our series (28.7 years) was slightly lower than other studies (29-36 years).[2,3,5,11] Unlike Kyozuka et al and Ananth et al, age was not associated with RPH in our data.[11,17]

Socioeconomic vulnerability characterized most patients; 43% were housewives and 20% farmers. Mushtaq et al, in Pakistan, 2020, similarly reported 76.7% of RPH cases among low-income women.[11] Although not statistically significant here, poverty likely influences access to antenatal care and management of risk conditions. In Madagascar, about 79% of the population lives below the extreme poverty line (USD 1.90/day).[18] Farming occupation was, however, significantly associated with RPH (p=0.001; OR=5.75; 95% CI: 1.92-17.21). Young women in low-income settings often have limited education and antenatal follow-up, hindering early detection and control of hypertensive disorders.[12] In our study, the absence of antenatal visits was related to RPH (p=0.001; OR=6.51; 95% CI: 1.97-21.44), suggesting that inadequate follow-up may increase risk through poor management of underlying conditions.

Hypertensive disorders and preeclampsia were major associated factors (p=0.000; OR=5.68; 95% CI: 2.8-11.5), affecting 51.7% of cases versus 15.8% of controls. This agrees with several studies identifying hypertension as a principal risk factor.[3,5,6,11,12] The likely explanation is delayed diagnosis and insufficient management due to limited antenatal surveillance.[3] Notably, attending at least four antenatal visits had a protective effect (p=0.002; OR=0.35; 95% CI: 0.18-0.67), confirming that adequate follow-up can prevent severe outcomes in high-risk pregnancies.

A striking finding was the strong association between RPH and abdominal massage during pregnancy (p=0.000; OR=13.57; 95% CI: 5.15-35.73). This traditional practice, observed in 41.7% of cases versus 5% of controls, is culturally widespread in Madagascar and other regions.[19] It is commonly believed to aid fetal positioning or ease labor.[20,21] However, studies have linked it to uterine rupture and premature membrane rupture.[22,23] Among low-income populations, reliance on traditional medicine remains frequent due to accessibility and cost.[24] Although our data suggest a strong statistical link, the biological mechanism remains unclear; the practice may represent a major local risk factor for RPH.

Preterm delivery (<37 weeks) was significantly associated with RPH (p=0.000; OR=7.97; 95% CI: 3.91-16.25); 59.9% of cases delivered before 37 weeks. Similar findings were reported by Mushtaq et al, 2020 (mean 35.7 weeks) and Saquib et al, 2020 (median 36 weeks; 51% preterm).[1,5] Tikkanen et al, 2011, also noted 40-60% preterm births in RPH cases. The association likely reflects RPH leading to premature delivery rather than the reverse. As RPH constitutes an obstetric emergency threatening both mother and fetus, urgent caesarean delivery is often required.[1,4-6] In our series, 83.3% of cases underwent caesarean section, significantly associated with RPH (p=0.000; OR=23.57; 95% CI: 10.31-53.85). This rate aligns with Rakotozanany et al, in Madagascar (79.9%), and Li et al, in China (73%).[7,13]

Overall, RPH appears closely linked to socioeconomic factors, limited antenatal care, hypertensive disorders, and traditional abdominal massage, all contributing to poor maternal and fetal outcomes in the Malagasy setting.

This study has few limitations. This study did not include all RPH risk factors but identified key ones within its scope. As a retrospective study, it was subject to information bias due to incomplete or inconsistent medical records.

CONCLUSION

RPH remains a serious obstetric emergency with variable incidence. In this study, abdominal massage was the main

risk factor, followed by hypertension, preeclampsia, lack of antenatal care, and low socioeconomic status. RPH was often associated with preterm delivery.

As a single-center retrospective study, these results cannot be generalized to all Malagasy women. Multicenter prospective studies are recommended to better identify and prevent RPH risk factors in this context.

ACKNOWLEDGEMENTS

Authors would like to thank the Department of Obstetrics and Gynecology, CENHOSOA, for their support in data collection and record management.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Ranjandriarison DT, Rakotondraibe AM, Rakotovao HA, Raelison JG, Rabarikoto HF, Randriamahavonjy R. Retroplacental hematoma: epidemiological profile and associated risk factors among Malagasy women at the Soavinandriana Hospital Center (CENHOSOA). Int J Res Med Sci 2025;13:5184-9.