



Study of preeclampsia and eclampsia cases and controls in Tete (Mozambique)

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INTRODUCTION

Preeclampsia remains one of the most enigmatic and challenging obstetric complications². It is defined as the discovery of multisystemic affectation, occurring after the twentieth week of pregnancy that presents with hypertension and proteinuria, or hypertension and one of the following symptoms: thrombocytopenia (platelet count below 100,000/microliter), renal failure (serum creatinine over 1.1 mg/dl), altered hepatic tests (transaminase levels higher than double the standard figures), pulmonary edema and new-onset cerebral or visual symptoms⁴.

Worldwide, preeclampsia prevalence fluctuates between 2 and 10% of pregnancies, depending on each country's socioeconomic situation.

In Mozambique, at Tete Provincial Hospital specifically, a descriptive study was carried out. It showed that preeclampsia prevalence reached 12% in women younger than 20 (12,5%)¹⁴, and increased to 21,2% in adolescents¹⁵. It was also responsible for 8,7% of maternal mortality due to obstetric causes, and the main cause of diagnosed intrauterine death, which meant 14% of the total of fetal losses¹⁶, with a mortality rate of 256 stillbirths out of 1000 births¹⁷.



Figure 1. Districts of Tete

Determining the influential factors in an environment such as Mozambique's central area is imperative in order to institute preventive measures to decrease the incidence and its complications in endemic regions.

HYPOTHESIS

Which are the socio-environmental, demographic or gynecologic risk factors linked to preeclampsia and eclampsia? Are there epidemiological differences between the pregnant women afflicted with preeclampsia than those afflicted with eclampsia?

AIMS

The primary aim of this study is to determine the factors associated with the development of preeclampsia and eclampsia in pregnant women admitted to Tete Provincial Hospital's maternity area.

MATERIAL AND METHODS

DESIGN OF THE STUDY

An analytical study of cases and controls was carried out. The final sample consisted of 195 women from the province of Tete, Mozambique. The data was collected in the delivery room, from the women admitted to Tete Provincial Hospital's maternity area, from March 1, 2017 to November, 30 2017.

DATA COLLECTION

The questionnaire used (**Anexo 1**), divided into sections, provided the following information:

1. Personal information: date of birth, size, weight, age.
2. Sociodemographic factors: occupation conditions, district of provenance.
3. Medical history: personal background, gynecologic-obstetric background, birth data and complications.
4. Neonate information: somatometric, Apgar Score, pathological incidents.

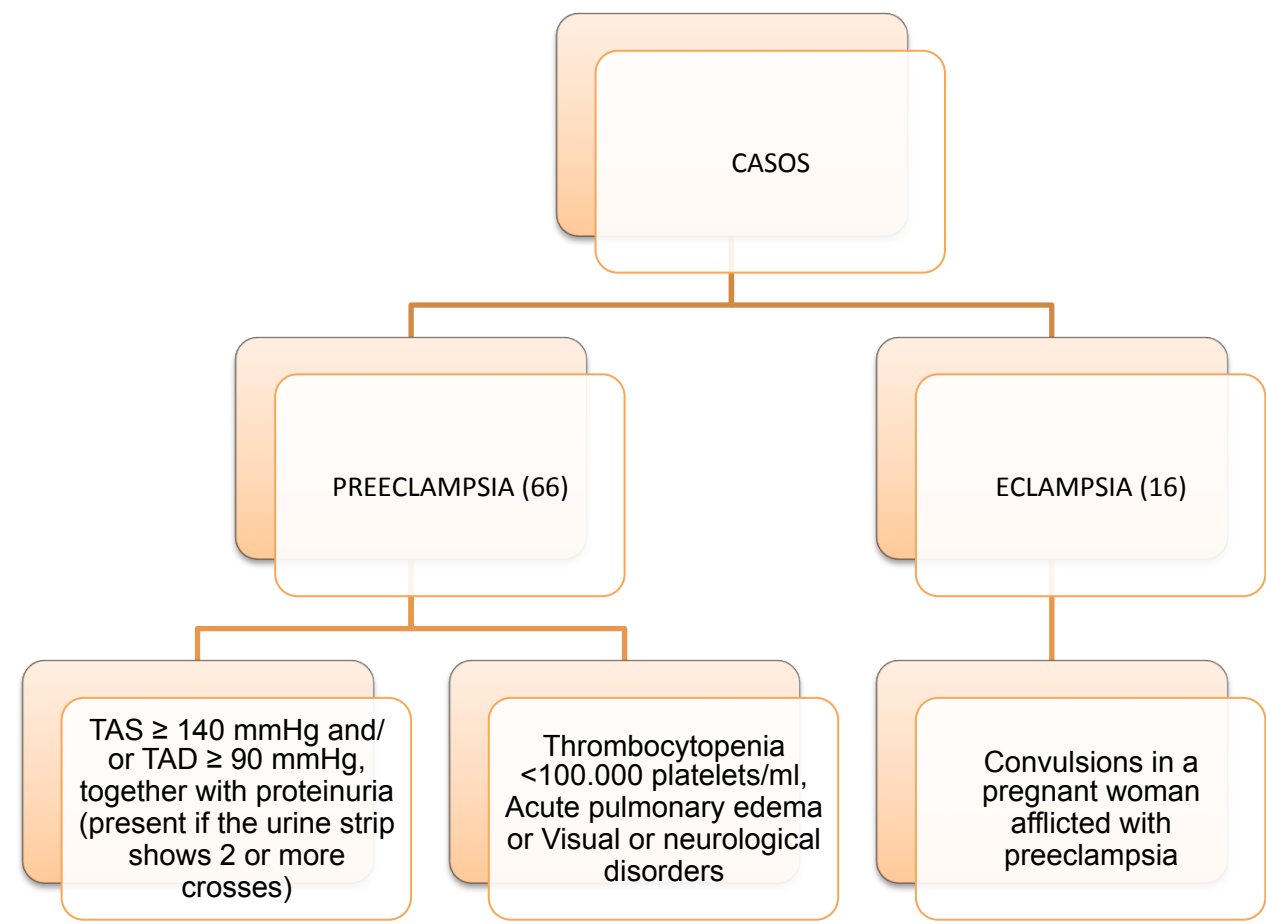
INCLUSION AND EXCLUSION CRITERIA

The women who did not want to participate in the study and those whose information could not be gathered were excluded.

PARTICIPANT SELECTION

Participant selection was made by means of a random sampling of women who met the criteria for inclusion in the study. The pregnant women were divided into two groups:

- **Cases:** a total of 82 pregnant women who went to Tete Provincial Hospital were included. 66 of them met the diagnostic criteria for preeclampsia, and 16 of them met the diagnostic criteria for eclampsia.



- **Controls:** a total of 113 pregnant women who went to the hospital were included. They did not show diagnostic criteria for preeclampsia and their age range and pregnancy state were similar to the group of patients defined as cases.

ABSTRACT

Introduction: Preeclampsia and eclampsia are prevailing obstetric pathologies in Sub-Saharan Africa. Their role is relevant to maternal morbimortality, and constitutes the third cause of pregnancy complications. Their etiopathology remains an enigmatic fight for the scientific community, since risk factors occur differently depending on the socioeconomic situation of each country.

Aims: Determining the factors associated to the development of preeclampsia and eclampsia in the pregnant women admitted to Tete Provincial Hospital's maternity area. Secondary aims are to assess perinatal complications and compare the results with similar studies from different geographical areas.

Methods: An analytical study of cases and controls was carried out with 195 pregnant women admitted to Tete Provincial Hospital, of which 82 were cases (66 had a diagnostic criteria of preeclampsia, 16 of eclampsia) and 113 were controls. Sociodemographic variables, medical history, obstetric characteristics and neonatal variables were assessed.

Results: Pregnant women afflicted with preeclampsia were significantly of urban (p=0.007), adolescent (p=0.016 OR: 2.313; IC 95% (1.170 ; 4.570), primiparous (p=0.020) or with a multiple pregnancy (p=0.013), of greater weight for preeclampsia and lesser weight for eclampsia (p=0.031). Hypertensive stages during birth increase the risk of low birth weight (<2500g) (OR = 2,54; IC del 95% = 1,05 a 6,12).

Conclusions: adolescence turned out to be a risk factor for preeclampsia and eclampsia development.

RESULTS

The total sample size was 195 women, with 57,95% (N=113) of controls and 42,05% (N=82) of cases of preeclampsia or eclampsia, of which 8,20% (N=16) accrue to eclampsia.

	Total N = 195	Normal N = 113	Preeclampsia N = 66	Eclampsia N = 16	P
Age	24.0 ± 6.7	24.7 ± 6.8	23.6 ± 6.6	20.8 ± 5.0	0.082
Adolescents	63 (32.3)	28 (24.8)	27 (40.9)	8 (50.0)	0.024
Weight, kg	67.5 ± 14.0	66.3 ± 11.7	70.7 ± 16.7	58.6 ± 8.6	0.031
Districts					0.007
Urban: Tete, Moatize, Mutarara	123 (63.1)	60 (53.1)	52 (78.8)	11 (68.8)	
Peri-urban: Changara	4 (2.1)	2 (1.8)	1 (1.5)	1 (6.2)	
Rural: all the others	68 (34.9)	51 (45.1)	13 (19.7)	4 (25.0)	

Table 1. Personal and demographic characteristics.

	Total N = 195	Normal N = 113	Preeclampsia N = 66	Eclampsia N = 16	P
Number of pregnancies					0.020
Primiparous	73 (37.4)	33 (29.2)	32 (48.5)	8 (50.0)	
Multiparous	122 (62.6)	80 (70.8)	34 (51.5)	8 (50.0)	
Type of gestation					0.013
Singleton	181 (94.3)	110 (98.2)	56 (87.5)	15 (93.8)	
Multiple	11 (5.7)	2 (1.8)	8 (12.5)	1 (6.2)	
HIV	33 (17.0)	24 (21.4)	6 (9.1)	3 (18.8)	0.096
Malaria during pregnancy	9 (4.7)	6 (5.4)	2 (3.1)	1 (6.7)	0.650
Malaria during labor	7 (3.8)	7 (6.5)	0 (0.0)	0 (0.0)	0.094
Previous miscarriage	10 (5.1)	6 (5.3)	4 (6.1)	0 (0.0)	0.51

Table 2. Obstetric characteristics.

	Total N = 195	Normal N = 113	Preeclampsia N = 66	Eclampsia N = 16	P
Type of delivery					<.001
Eutocic	135 (71.8)	89 (80.2)	41 (67.2)	5 (31.2)	
Vacuum	7 (3.7)	6 (5.4)	0 (0.0)	1 (6.2)	
Caesarian section	46 (24.5)	16 (14.4)	20 (32.8)	10 (62.5)	
Threatened preterm labor	11 (5.7)	4 (3.6)	5 (7.8)	2 (12.5)	0.179
IUGR	5 (2.7)	1 (0.9)	3 (4.7)	1 (6.2)	0.144
UTI peri-delivery	28 (14.9)	16 (14.7)	8 (12.7)	4 (25.0)	0.416
Maternal fever during delivery	6 (3.2)	3 (2.8)	2 (3.2)	1 (6.2)	0.531
Intradelivery maternal hemorrhage	7 (3.8)	5 (4.6)	1 (1.6)	1 (6.2)	0.397
Episiotomy	8 (8.2)	7 (10.9)	1 (3.9)	0 (0.0)	0.593

Table 3. Obstetric complications.

	Total N = 195	Normal N = 113	Preeclampsia N = 66	Eclampsia N = 16	P
Male gender	96 (52.5)	58 (53.7)	33 (55.9)	5 (31.2)	0.354
Weight, kg	3.0 (2.6 ; 3.3)	3.1 (2.8 ; 3.4)	2.8 (2.5 ; 3.1)	2.5 (2.3 ; 2.8)	<.001
Weight range					<.001
< 2500 g	33 (17.8)	11 (10.0)	15 (25.4)	7 (43.8)	
≥2500 g	152 (82.2)	99 (90.0)	44 (74.6)	9 (56.2)	
Size, cm	48 (46 ; 50)	48 (46 ; 50)	48 (45 ; 49)	46 (45 ; 48)	0.117
Cephalic perimeter, cm	34 (32 ; 35)	34 (32 ; 35.5)	34 (32 ; 35)	32 (32 ; 33.2)	0.067
Apgar minute 1	8 (6 ; 9)	8 (7.8 ; 9)	8 (5.5 ; 8)	6 (3 ; 8)	<.001
Apgar range					<.001
< 7	47 (26.4)	17 (16.3)	21 (35.6)	9 (60.0)	
≥ 7	131 (73.6)	87 (83.7)	38 (64.4)	6 (40.0)	
Respiratory distress	5 (2.8)	4 (3.7)	1 (1.7)	0 (0.0)	0.780
Neonatal death	16 (8.6)	8 (7.2)	4 (6.8)	4 (25.0)	0.072

Table 4. Immediate neonatal complications.

	P	OR (95% CI)
Teenagers	0.016	2.313 (1.170 ; 4.570)
APGAR_M1, per unit	0.008	0.823 (0.713 ; 0.951)
Low birth weight	0.038	2.542 (1.055 ; 6.125)

Table 5. Multivariate logistic regression for the pregnancy hypertension (preeclampsia and eclampsia).

The sole maternal risk factor for preeclampsia and eclampsia was adolescent pregnancy (OR=2.313; IC 95% (1.170 ; 4.570) (**Table 5**).

CONCLUSIONS

- The factor linked to preeclampsia and eclampsia development is adolescence.
- Most pregnant women afflicted with these pathologies came from the urban districts.
- There were no significant differences between the control and case groups in connection with urinary tract infections (UTI), HIV and malaria.
- The percentage of caesarean sections in the group of women afflicted with eclampsia was significantly higher, 62,5%.
- Preeclampsia and eclampsia were linked to low weight at birth. The Apgar scores were also lower and the need for cardiopulmonary resuscitation was higher.
- The hypothesis that multiple factors are involved in this pathology is confirmed. The necessity to implement preventive measures in order to reduce their occurrence and complications in the city of Tete is also confirmed.