Risk Factors in Mozambican Women with Eclampsia: A Case-Referent Study

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ABSTRACT

In Maputo 133 consecutive eclamptic patients were compared with 393 non-eclamptic referent women. Significant risk factors for eclampsia were age ≤ 18 years, household size ≤ 3 individuals, unwanted pregnancy, walking to antenatal clinics and, in the third trimester, headache, foot oedema, hand or face oedema, epigastric pain, visual disturbance, ear buzzing and dizziness. Significantly more cases than referents reported no blood pressure measurements in antenatal clinics. It is concluded that the quality of antenatal clinics can be improved by enhanced community awareness of danger signs, by early recognition of risk factors and by better management of prodromal symptoms of eclampsia. (*Afr J Reprod Health* 2001; 5[2]:30-35)

RÉSUMÉ

Facteurs de risque chez les femmes mozambicaines atteintes de l'éclampsie: Une étude de cas-référent. A Maputo, 133 malades consécutives atteintes de l'éclampsie ont été comprarées à 393 femmes référentes qui n'étaient pas atteintes de l'éclampsie. Les facteurs à risque significatifs pour l'éclampsie étaient l'âge de ≤ 18 ans; la taille du ménage était de ≤ 3 individus, la grossesse non désirée, la fréquentation à pied à la clinique prénatale et pendant le troisième trimestre, le mal à la tête, l'oedème du pied, l'oedème de la main ou du visage, douleurs épigastriques, désordres visuels, bourdonnement d'oreilles et le vertige. De manière significative, il y avait plus de cas que des référents qui n'avaient pas signalé des mesures de la pression artérielle dans les consultations prénatales. Nous avons conclu que la qualité des consultations prénatales peut être améliorée à travers un programme de sensibilisation plus poussée de la communauté par rapport aux signes de danger, en reconnaissant tôt les facteurs de risque et par un meilleur traitement des symtômes prodromes de l'éclampsie. (*Rev Afr Santé Reprod* 2001; 5[2]:30-35)

KEY WORDS: *AIDS, contraceptive practices, Ghana, knowledge, risks*

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Introduction

Eclampsia is among the predominant causes of maternal death.[1] While incidence figures in developed regions are low, eclampsia continues to be a major threat to maternal health in most low-income countries. The emphasis of research is more on pregnancy-induced hypertension than on eclampsia, and literature on the epidemiology of eclampsia is limited regarding background characteristics and risk factors.[2,3] In clinical studies on eclampsia, research has been devoted to the characteristics and management of various complications[3,4] and to the therapeutic handling of the eclamptic patient.[5]

It is probable that reported high case fatality rates are due to delay in appropriate management of eclampsia. Latency between referral and arrival at hospitals, and deficient emergency management of eclamptic cases may contribute to elevated mortality. It has been shown that the most influential factor marking the severity of eclampsia is the timing of the critical process.[3] Various studies on eclamptic patients have revealed that eclampsia presumably comprises a number of sub-types of the condition. Characteristics distinguishing these sub-types may comprise commencement of convulsions in relation to delivery, gestational age at onset of convulsions, presence of concurrent diseases, age of the patient, number of previous pregnancies, and multiple gestation.[3]

Few case-control studies have focused on background factors in eclampsia. The aetiology of eclampsia is unknown and numerous hypotheses have been presented to explain the condition.[5-10] To our knowledge there are no studies published from low-income countries on risk factors for eclampsia utilising case-control approach. A few studies from affluent countries[11-13] have described various risk factors for eclampsia. Two studies have described risk factors in complicated eclampsia in Colombia[14,15] and one in Kuwait.[16]

The purpose of the present study was to elucidate background risk factors in eclamptic patients in Maputo City by comparing them with a population of non-eclamptic women sampled at random in order to be representative of all pregnant women in this setting.

Subjects and Methods

One hundred and thirty-three eclamptic women admitted to the outpatient obstetric ward of the Maputo Central Hospital were consecutively enrolled during 1995 in the study. After recovery they were interviewed regarding background data. In order to create a referent group, three non-eclamptic referent women were recruited for each eclamptic woman enrolled. The referent women were selected at random, whereby one third were recruited from the Maputo Central Hospital and two thirds from other maternity clinics in the capital. The selection of referent women was carried out by choosing the first two women who delivered in a peripheral maternity clinic and the first in the central hospital on the same day when a case (eclampsia) was registered. About 30% of all hospital deliveries take place in the Maputo Central Hospital, while about 70% take place in other maternity clinics. The distribution of patients is largely determined by referrals due to identification of high risk factors. It was therefore considered suitable to have the given distribution of referents regarding place of delivery.

All women were interviewed after they regained consciousness by social workers who had previously been trained in interviewing techniques. The questionnaire had been prepared in collaboration with social service technicians regarding social and familiar conditions of the women, family income and composition, household size, working and eating habits, and the duration of stay in their current residence. Part of the questionnaire concerned current pregnancy, antenatal clinic attendance, access to such clinics, and indirect indicators of the quality of antenatal care. Weekly meetings were arranged between the social workers and authors to discuss any methodological or logistical problems that social workers had met with during data collection from cases and referents.

The compiled data were analysed using *Epi Info* version 5.00 from CDC Atlanta, Georgia, USA. Odds Ratios (OR) were calculated with 95% confidence intervals (CI). The Ethical Commission of Maputo Central Hospital had accepted the project.

Results

The main findings are summarised in Table 1. Young women were over-represented among eclamptics (43.6% versus 17.7% referents). The vast majority

of both cases and referents were unsalaried domestic workers. Most women in both groups were living alone. Few or no years at school, in spite of their younger age, tended to be less common among cases than among referents. Limited household size (≤ 3 individuals) was significantly more common among cases, presumably reflecting their younger age. Cases reported more often that the pregnancy was unwanted and/or that they had considered pregnancy interruption. Reported nutritional problems tended to be less common among cases than among referents. Cases and referents were equally likely to express a fear of disease and to have been hospitalised during a previous pregnancy.

Table 1 **Socio-Economic Risk Factors Associated with Eclampsia (Odds Ratios [OR] with 95% Confidence Intervals [CI])**

Parameter	Cases	Referents	OR	95% CI
Age ≤ 18 years	58/133	68/385	3.61	2.29–5.68
Non salaried homework	111/130	323/393	1.27	0.71–2.28
Living alone	111/133	333/390	0.86	0.49–1.53
Schooling 0–3 years	27/131	111/393	0.66	0.40–1.09
Refugee status	0/130	3/389	0	0–7.20
Household size ≤ 3 individuals	35/132	56/392	2.16	1.30–3.59
Household size ≥ 10 individuals	18/132	90/392	0.53	0.29–0.95
Unplanned pregnancy	71/131	157/389	1.75	1.15–2.66
Admitted poor marital relationship	12/133	18/393	2.07	0.91–4.67
Occasional starvation	35/132	148/390	0.59	0.37–0.93

Table 2 **Clinical Factors and Prodromal Symptoms Associated with Eclampsia (Odds Ratios [OR] with 95% Confidence Intervals [CI])**

Parameter	Cases	Referents	OR	95% CI
Hospitalisation during last pregnancy	12/131	44/385	0.78	0.38–1.59
Hypertensive disease	52/129	96/386	2.04	1.31–3.17
Reported other disease	51/129	132/391	1.28	0.83–1.97
Severe headache during previous pregnancy	78/129	124/386	3.23	2.10–4.99
Foot oedema	87/129	120/386	4.59	2.93–7.20
Face or hand oedema	32/129	18/386	6.74	3.49–13.13
Epigastric pain	57/129	102/386	2.20	1.43–3.41
Visual disturbance	23/129	24/386	3.27	1.70–6.29
Irritability	38/129	86/386	1.46	0.91–2.33
Ear buzzing	15/129	20/386	2.41	1.13–5.11
Dizziness	58/129	100/386	2.34	1.51–3.61
Insomnia	38/129	93/386	1.32	0.82–2.10
Without prodromal symptoms	5/129	23/386	0.64	0.19–1.76

Table 3 **Health Service Factors Associated with Eclampsia (Odds Ratios [OR] with 95% Confidence Intervals [CI])**

Parameter	Cases	Referents	OR	95% CI
Ever referred during previous pregnancy	27/124	81/391	1.05	0.63–1.77
Arrival interval (hospital to hospital) < hours	34/74	80/161	0.86	0.48–1.55
Referral-arrival interval ≥ 24 hours	6/46	1/82	12.15	1.38–565.55
1–3 antenatal visits	18/118	65/375	0.86	0.47–1.57
> 5 antenatal visits	30/118	93/375	1.03	0.62–1.71
Never had blood pressure measurement at ANC clinic	16/125	17/387	3.19	1.48–6.90
Distant ANC clinic at first visit	30/124	168/391	0.42	0.26–0.68
Distant ANC clinic at last visit	29/106	166/391	0.51	0.31–0.84
Perceived poor staff behaviour at ANC clinic on first visit	7/130	2/391	3.68	2.06–109.94
Perceived poor staff behaviour at ANC clinic on last visit	7/119	4/355	5.48	1.36–25.91
Walking distance < 30 minutes from home to ANC clinic	41/132	108/392	1.18	0.75–1.86
Walking to ANC visits	80/127	111/392	4.31	2.77–6.72

The following symptoms (Table 2) were encountered significantly more often among cases than among referents in the third trimester: headache, foot oedema, hand or face oedema, epigastric pain, visual disturbances, ear buzzing and vertigo. Insomnia and irritability were equally prevalent among cases and referents. The proportion of women without any symptom of disease was similar among cases and referents, while about half of eclamptic cases had presented prodromal symptoms indicative of pre-eclampsia/eclampsia, only 27/124 (22%) had been referred at any time during pregnancy.

There was no difference in the proportion of cases and referents who had < 3 or > 5 antenatal visits (Table 3). The direct questioning of cases and referents regarding whether or not they had been subject to blood pressure measurement revealed that 16/125 (13%) of cases and 17/387 (4%) of referents had not been regularly subject to such measurement (OR 3.19; 95% CI 1.48–6.90). Access to antenatal clinics was no worse for eclamptic cases than for referent women, whether at enrolment in antenatal care (OR 0.42; 95% CI 0.26–0.68) or in late pregnancy (OR 0.51; 95% CI 0.31–0.84). Attitudes of antenatal clinic staff were considered to be poor significantly more often among cases than among referents, both in early pregnancy (OR 3.68; 95% CI 2.06–109.94) and in late pregnancy (OR 5.48; 95% CI 1.36–25.91). Eclamptic cases were significantly more often without access to transport and had to walk to reach antenatal clinics (OR 4.31; 95% CI 2.77–6.72).

Discussion

The present study provides new information on the background factors of patients with eclampsia in urban Mozambique. Eclamptic women in this setting are on average younger, with smaller households, and more likely to be carrying an unwanted pregnancy than women without eclampsia. A number of prodromal symptoms are reported to precede eclamptic convulsions. Salient symptoms include severe headache, foot, face and hand oedema,

epigastric pain, visual disturbance, ear buzzing and dizziness. We have shown that neither the women themselves nor antenatal clinic staff were sufficiently informed about these prodromal symptoms, which were significantly more prevalent among pre-eclamptic women. This finding has implications for the health organisation. Maternal health education at antenatal clinics may benefit from the recognition of such prodromal symptoms among women with pre-eclampsia. It was further demonstrated that prodromal symptoms, even if presented by the patients, were not adequately acted upon. Only a fraction of those who admitted prodromal symptoms were referred for follow-up.

The fact that antenatal clinic visits were similar in the two groups indicates that antenatal clinic attendance per se does not protect women from acquiring eclampsia. Severe material constraints and non-functioning blood pressure measurement routines contributed to a sub-standard level of antenatal management. The interpretation of interviews carried out with eclamptic patients after they had regained consciousness can always be suspected to contain a recall bias. It is inevitable that some bias might have prevailed regarding appreciation of antenatal care. Nonetheless, client satisfaction with staff accomplishment of clinical duties and staff behaviour was significantly lower among cases than among referents.

Two studies in the United States[11,12] have shed light on risk factors in women suffering from eclampsia. In Houston, Texas, it was demonstrated that risk factors for eclampsia included two or fewer antenatal care visits, urinary tract infection, primigravidity, obesity, black ethnicity, history of diabetes and age $\leq$ 20 years. Whereas low age was confirmed as a risk factor, nulliparity was not, when controlled for primigravidity. Previous history of abortion and previous history of pregnancy-induced hypertension were not found to represent risk factors for eclampsia.[11]

A similar study was carried out in Washington State (1984–1990)[12] in which the risk was found to be elevated in women without prenatal care and with weight gain of more than thirty pounds during pregnancy. Nulliparity and chronic hypertension were found to be risk factors, whereas women's race, urban or rural place of residence, history of preterm births and anaemia were not associated with eclampsia.

In Cali, Colombia, risk factors for complicated eclampsia were studied in order to distinguish them from non-complicated eclamptic "controls".[14] Risk factors for complicated eclampsia were shown to include maternal age over 26 years, multiparity and no prenatal care. Like other studies,[3,13,17,18] indications were found that preterm eclampsia is associated with more severe forms of the disease.

In efforts to reduce the case-fatality rate of eclamptic women in countries with high incidence of eclampsia, it is important to focus on interventions aiming at women's recognition of prodromal symptoms. In low-income countries, such research results are scarce, and to our knowledge there is no case referent approach to socio-economic factors, clinical signs and health service factors in eclamptic women in such countries.[19,20] This study provides a number of leads, giving operational information to antenatal clinics. Lacking recognition of prodromal signs in antenatal care was noted and blood pressure measurements were not carried out as prescribed in prevailing antenatal care routines. The ensuing deficient control of pregnant patients was found to be over-represented among cases.

Eclampsia remains one of the leading causes of maternal and perinatal mortality and morbidity. Its aetiology remains unknown. However, major advances have been made regarding its pathogenesis, potential prevention, early detection and active management, even in low-income countries.[19] Early detection still constitutes a serious clinical challenge. A significant proportion of eclamptic convulsions occurs unexpectedly and cannot be foreseen.[13] For women with prodromal signs it is of utmost importance to strengthen the competence of antenatal clinic staff to respond to clinical risk symptoms and intervene accordingly.

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