

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20185404>

Original Research Article

Maternal and perinatal outcome in women with eclampsia: a retrospective study at the University of Benin Teaching Hospital

Collins E. M. Okoror*

Department of Obstetrics and Gynaecology, University of Benin Teaching Hospital, Benin City, Nigeria

Received: 07 November 2018

Accepted: 06 December 2018

***Correspondence:**

Dr. Collins E. M. Okoror,

E-mail: collinsokoror@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Eclampsia is a serious obstetric complication with attendant high maternal and perinatal morbidity and mortality especially in the developing countries. This study aims to assess the maternal and perinatal outcomes of eclampsia and suggest ways to improve them.

Methods: This was a 5-year retrospective study (2009-2013) of cases of eclampsia managed at the University of Benin Teaching Hospital, Benin City, Nigeria. The number of cases managed was obtained from records at the emergency room, labour ward, theatre, lying-in wards and special care baby unit and case notes of patients satisfying the inclusion criteria retrieved from the medical records library.

Results: The prevalence of eclampsia was 1.99% of total deliveries. It was highest in teenagers (29%), nulliparous (3.1%) and the unbooked (8.5%). Antepartum eclampsia accounted for 69.6% of the cases and a majority (74.6%) was delivered by emergency caesarean section. Eclampsia resulted in 27.78% of total maternal mortality, case fatality rate of 15.96% and eclampsia-related maternal mortality ratio of 318/100,000 deliveries. Perinatal mortality rate was 131/1000 eclamptic deliveries.

Conclusions: The maternal outcome worsened with increasing blood pressure, number of convulsion episodes prior to presentation, the time interval between 1st convulsions to delivery, level of proteinuria on dip stick and reduced urine output. Vaginal delivery was associated with more early neonatal deaths and birth asphyxia. More awareness and enabling factors should be created for more women to access antenatal facilities. The government should be committed to providing emergency obstetric care facilities in our hospitals for effective management of eclampsia.

Keywords: Benin City, Eclampsia, Maternal outcome, Perinatal outcome

INTRODUCTION

Hypertensive disorders are major causes of maternal and perinatal morbidity and mortality worldwide.¹

Eclampsia continues to be a problem, particularly in low-resource countries where it contributes significantly to high maternal and perinatal morbidity and mortality. Eclampsia is responsible for approximately 12% of all global maternal deaths and 16%-31% of perinatal deaths.^{2,3} Eclampsia is defined as one or more generalized

convulsions in the setting of preeclampsia.⁴ Nevertheless, eclampsia in the absence of hypertension with proteinuria was reported to account for 38% of cases in the United Kingdom.⁵ In another study in the United States, 16% of cases of eclampsia reported were without hypertension.⁶ Eclampsia is a common obstetric emergency. The more there is deprivation and lack of maternal healthcare organization, the higher the incidence of eclampsia; hence it is uncommon in the developed world. However, it remains a well-recognised major cause of maternal mortality. The incidence of eclampsia in developing

countries including Nigeria is difficult to ascertain because of poor record keeping. However, a rate of 13:1000 deliveries was quoted in Accra, Ghana and in Nigeria, a range of 0.91%-1.32% of deliveries was reported.⁷⁻¹⁰ In the UK where eclampsia is relatively rare, a national incidence of 4.9:10000 maternities has been quoted.⁵

Most cases of eclampsia present after the second trimester with the majority of eclamptic seizures occurring intrapartum or within the first 48 hours following delivery. Early detection of preeclampsia is key in the prevention of eclampsia since there is no reliable predictor.

The only cure for eclampsia is delivery of the baby with the placenta, which is the seat of the problem. Management of seizure is usually done by administration of anticonvulsants with magnesium sulphate as the drug of choice. Apart from aborting seizure, magnesium sulphate prevents recurrent seizures following eclampsia.¹¹

Magnesium sulphate has been shown to halve the risk of eclampsia among women with preeclampsia.¹² Antihypertensives are also given for blood pressure control. This study aims to assess the maternal and perinatal outcomes of eclampsia at the University of Benin Teaching Hospital and suggest ways to improve them.

METHODS

This was a retrospective descriptive study of cases of eclampsia managed at the University of Benin Teaching Hospital, Benin City, Nigeria over a 5-year period, from January 1, 2009 to December 31, 2013. Women who presented with eclampsia or developed it during their management in the hospital were included in the study. Babies delivered to women with eclampsia were included in the study.

Inclusion criteria

- All cases of eclampsia managed between January 1, 2009 and December 31, 2013 at the University of Benin Teaching Hospital were included in this study.

Exclusion criteria

- Cases with incomplete data or missing case notes were excluded from the review.

Data collection

The number of cases managed during the period of review was obtained from records at the emergency

room, labour ward, theatre, lying-in wards and special care baby unit. Case notes of patients satisfying the inclusion criteria were retrieved from the medical records library, and information pertaining to their age, parity, gestational age at delivery and booking status obtained. Information on the level of proteinuria and blood pressure at presentation, urine output, mode of delivery, time of eclampsia, fit control, place of delivery, and foetal outcome were also obtained from the records.

Statistical analysis

The data were checked for completeness. They were cleaned, coded and entered into Microsoft Excel and analysed using statistical IBM SPSS Statistics version 20.0. Descriptive statistics were computed to determine the prevalence of eclampsia, maternal mortality ratio, case fatality and in other relevant areas. Bivariate analysis using Chi-square/Fischer's exact tests was performed on categorical variables. In all statistical tests, a value of $p < 0.05$ was considered statistically significant.

RESULTS

During the period under review, a total of 14,150 deliveries were recorded with 282 cases of eclampsia, giving a prevalence of 1.99% of the total deliveries.

Total maternal death during this period was 162, out of which eclampsia accounted for 45 cases resulting in 27.78% of total maternal mortality and a case fatality rate of 15.96% and eclampsia-related maternal mortality ratio (MMR) of 318/100,000 deliveries.

There were 264 births (260 singletons and 4 sets of twins). There were 37 perinatal deaths (18 stillbirths and 19 early neonatal deaths), giving a perinatal mortality rate of 131/1000 eclamptic deliveries. Of the 282 cases of eclampsia during the period under review, 276 case notes were available for review; hence analysis was based on the 276 cases.

The majority of cases of eclampsia were of the age group 25-29 years (35.51%) but the risk per delivery (incidence) was highest among women who were <20 years of age (29.03%).

Cases of eclampsia were slightly more at the gestational age of >37 weeks compared to earlier gestational age (59.42% vs 40.58%) but the incidence was higher among those that delivered preterm at <37 weeks gestation (10.46%) than at term (1.25%). Nulliparous women accounted for 65.58% of cases of eclampsia and with a rate of 3.10% of deliveries. As expected, the unbooked had the highest rate of eclampsia (8.49%) compared to 0.05% among the booked patients and accounted for 98.19% of cases of eclampsia (Table 1).

Table 1: Distribution of maternal characteristics and incidence of eclampsia in UBTH.

Characteristics	Cases of eclampsia n (%)	Total number of deliveries n (%)	Risk per delivery %	p -value
Age (years)				
<20	45 (16.30)	155 (1.10)	29.03	<0.001
20-24	25 (9.06)	1518 (10.73)	1.65	
25-29	98 (35.51)	5373 (37.97)	1.82	
30-34	50 (18.12)	4485 (31.70)	1.11	
≥35	58 (21.01)	2619 (18.51)	2.22	
Gestational age (weeks)				
<37	112 (40.58)	1071 (7.57)	10.46	<0.001
≥37	164 (59.42)	13079 (92.43)	1.25	
Parity				
0	181 (65.58)	5833 (41.22)	3.10	<0.001
1-4	89 (32.25)	8007 (56.59)	1.11	
≥5	6 (2.17)	310 (2.19)	1.94	
Booking status				
Booked	5 (1.81)	10958 (77.44)	0.05	<0.001
Unbooked	271 (98.19)	3192 (22.56)	8.49	

About 70% of cases occurred during the antepartum period with the remainder occurring intrapartum (26.10%) and postpartum (4.30%) (Figure 1).

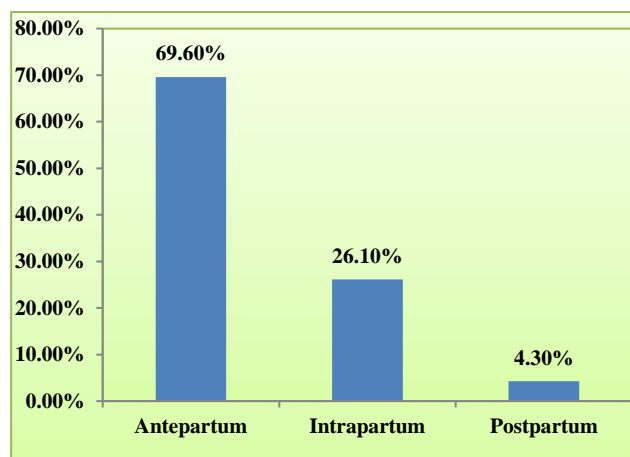


Figure 1: Period of occurrence of eclampsia.

The pie chart shows the mode of delivery of the eclamptic patients that presented antepartum and intrapartum.

Most of the patients 74.62% (n=197) had Caesarean section while 14.77% (n=39) and 10.61% (n=28) had forceps delivery and spontaneous vaginal delivery respectively. (Figure 2)

Maternal mortality from eclampsia increased with increasing blood pressure with the majority of deaths recorded among the women who presented with SBP >160 mmHg and DBP >110 mmHg with case fatality rate of 17.18% and 17.26% respectively. Similarly, case fatality increased with increasing number of convulsions;

32.14% in those with >3 episodes compared to 6.30% among those that had 1 episode of convulsion. Women who had delivery within 6 hours of the first convulsion had the least number of maternal mortality (2.94%) compared to those that delivered after 18 hours (29.11%).

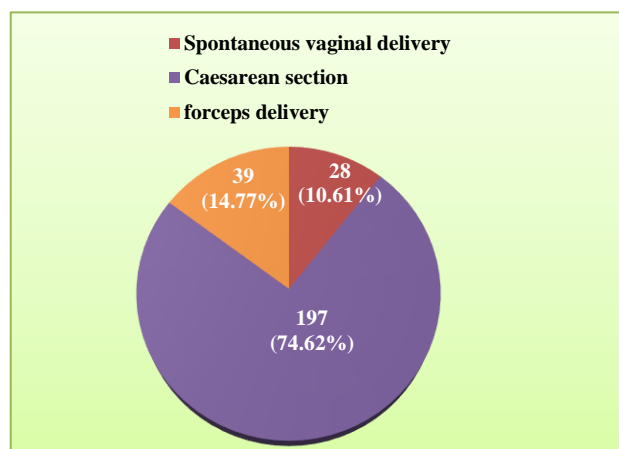


Figure 2: Mode of delivery.

Maternal death was highest in those who had dip stick proteinuria of 3+ (25.33%).

The average volume of urine output showed an inverse relationship to maternal death with a case fatality of 54.84% among those with <30 ml/hr compared with 11.43% among those with urine output of >30ml/hr. (Table 2)

Pulmonary oedema (14.86%), HELLP syndrome (12.32%) and renal failure (11.23%) ranked top among the complications in women that presented with eclampsia studied during the 5-year of review. (Table 3)

Neonatal deaths were higher in the vaginal delivery group; of the 28 vaginal deliveries, 8 presented with intrauterine foetal death and of the remaining 20, 4 had

early neonatal deaths (20%) compared with 5.71% and 11.77% for Caesarean section and forceps delivery respectively.

Table 2: Relationship between clinical parameters at presentation and maternal mortality.

Variables	No of patients n (%)	Maternal mortality n (%)	CFR (%)
SBP			
< 140	3 (1.09)	0	0
140-149	17 (6.16)	2 (4.44)	11.77
150-159	29 (10.51)	4 (8.89)	13.79
≥160	227 (82.25)	39 (86.67)	17.18
Mean±SD =160.9±5.0			
DBP			
<90	5 (1.81)	0	0
90-99	21 (7.61)	3 (6.67)	14.29
100-109	53 (19.20)	8 (17.78)	15.09
≥110	197 (71.38)	34 (75.56)	17.26
Mean±SD =110.6±6.8			
Convulsion episodes			
1	127 (46.01)	8 (17.78)	6.30
2	52 (18.84)	8 (17.78)	15.39
3	41 (14.86)	11 (24.44)	26.83
>3	56 (20.29)	18 (40.00)	32.14
1st convulsion-delivery interval (hour)			
<6	34 (12.32)	1 (2.22)	2.94
6-11	90 (32.61)	6 (13.33)	6.67
12-17	61 (22.10)	15 (33.33)	24.59
>18	79 (28.62)	23 (51.11)	29.11
Dip stick proteinuria			
0	30 (10.87)	1 (2.22)	3.33
1+	72 (26.09)	9 (20.00)	12.50
2+	60 (21.74)	9 (20.00)	12.86
3+	75 (27.17)	19 (42.22)	25.33
4+	39 (14.13)	7 (15.56)	17.95
Average urine output (ml/hr)			
<30	31 (11.23)	17 (37.78)	54.84
≥30	245 (88.77)	28 (62.22)	11.43

SBP: systolic blood pressure; DBP: diastolic blood pressure; CFR: case fatality rate

Table 3: Complications in patients with eclampsia.

Maternal complications	Cases n (%)
Maternal death	45 (16.30)
Pulmonary oedema	41 (14.86)
HELLP syndrome	34 (12.32)
Renal failure	31 (11.23)
Transient blindness	22 (7.97)
Abruptio	18 (6.52)
Coagulopathy	11 (3.99)
Cerebrovascular accident	2 (0.73)

NB: some patients had multiple complications

However, cases of birth asphyxia were higher among the forceps delivery group; of the 39 patients that had a

forceps delivery, 5 presented with intrauterine foetal death while 19 (55.88%) of the remaining had birth asphyxia compared to 30% and 17.19% for spontaneous vaginal delivery and Caesarean section respectively (Table 4).

The lowest perinatal mortality (9.34%) and hence a better survival was among the normal birth weight babies (2.5-3.9 kg).

The highest perinatal mortality was among >4 kg babies. (Table 5) Majority of the babies were premature (41.79%) and was closely followed by jaundice in 30.22% of neonates and birth asphyxia in 22.39% of neonates. (Table 6).

Table 4: Relationship between mode of delivery and neonatal outcome.

Mode of delivery	APGAR Score		Stillbirth		ENND
	Normal	Birth asphyxia	MSB	FSB	
Spontaneous vaginal delivery	14	6	5	3	4
Caesarean section	161	35	1	4	11
Forceps delivery	15	19	3	2	4

Table 5: Relationship between birth weight and perinatal survival.

Birth weight (Kg)	No of patients	Perinatal death			Case fatality rate (%)
		MSB	FSB	ENND	
<2.5	81	3	5	9	20.99
2.5-3.9	182	5	3	9	9.34
≥4	5	1	1	1	60.00

DISCUSSION

Eclampsia has continued to contribute significantly to maternal morbidity and mortality in developing countries. The prevalence of eclampsia during the 5-year study period was 1.99% and accounted for 27.78% of the total maternal mortality and with a case fatality rate of 15.96%. This is comparable to the prevalence reported from Niger-Delta but higher than that from Kano and previous work in Benin City.^{9,10,13} In the developed countries, there has been a downward trend in its incidence. The high incidence in developing countries may be a reflection of poor utilization antenatal care, a factor known to have contributed to the drop-in cases of eclampsia in the developed countries of the world. This was evident from the fact that over 98% of cases were referred from the peripheral centres and various delivery homes. The perception that only bad cases or problematic women go to teaching hospitals may have influenced this. Also, the antenatal fees charged at these delivery homes are lower than that at the tertiary facilities. This group, apart from forming a larger percentage of the patients in this study, also had a higher rate of occurrence of eclampsia. This may be due to missed early detection of elevated blood pressure among the unbooked and even when detected, lack of expertise may result in poor management. The eclampsia-related mortality in this study was similar to that reported by Igberase and Ebeigbe but lower than that reported in Nguru.^{13,14} Meanwhile, a similar study by Lee et al in Nova Scotia reported an incidence of 0.27 per 1000 deliveries with no mortality.¹⁵ These increases in this study and others in other parts of the country may be attributed to the increasing number of maternity, spiritual and traditional homes where women book for antenatal care and delivery, with the bulk of women coming in a moribund state from these places. This case fatality rate is unacceptably higher than the maximum recommended 1% by the United Nations.¹⁶

The mean age of eclamptic women in this study was 27.99±5.22 years with a higher rate of eclampsia among

those below 20 years. The proportion of nulliparous women from present study was 65.58% with a prevalence of 3.1% which was significantly higher ($P < 0.001$) than in parous women. This is similar to previous findings.^{10,13} The higher proportion of nulliparity observed among women with eclampsia is in support of the fact that first deliveries take place mostly at extremes of age, below 20 years and above 35 years. Also, the incidence of teenage pregnancies is on the increase.

The maternal outcome worsened with increasing blood pressure, the number of convulsion episodes prior to presentation, the time interval between 1st convulsions to delivery, level of proteinuria on dip stick urinalysis and reduced urine output. This underscores the need for prompt diagnosis and management. Early delivery has been shown to correlate with reduced perinatal mortality in other studies.¹⁷ Studying timeliness of care for eclampsia in developing countries has been suggested as a step forward for improving component care.¹⁸

Morbidity and mortality in eclampsia remained high as seen in this study where eclampsia related maternal mortality was 318/100,000 deliveries. The main complications in this study included pulmonary oedema, HELLP syndrome, acute renal failure, transient blindness, abruptio placenta, coagulopathy and cerebrovascular accident.

The perinatal outcome was poor in those babies who were less than 2.5 kg but worst in those 4 kg or more. This finding may not be representative as only 5 babies were at least 4 kg, 2 of which were stillbirths. However perinatal deaths were less in those babies whose weight were between 2.5 kg and 3.9 kg. Caesarean section is in recent times becoming the preferred mode of delivery, especially in salvageable babies. This has resulted in a better perinatal outcome.¹⁹⁻²¹ This was corroborated in this study where neonatal survival was associated with Caesarean deliveries compared to other modes of delivery among women with antepartum eclampsia thus making caesarean delivery a better option of delivery in

these women presenting with antepartum eclampsia. Other studies have reported a similar outcome with Caesarean section in comparison to the vaginal route.²²⁻²⁴

Prematurity accounted for the highest neonatal complications and was also the major cause of neonatal death. Other complications included jaundice, birth asphyxia, small for gestational age and respiratory distress syndrome.

CONCLUSION

Eclampsia is still a major problem in this part of the world contributing to high maternal and perinatal mortality rate. Identified risk factors in this study were young age (<20 years), nulliparity and not having antenatal care. It is therefore recommended that measures be put in place to institute preventive interventions where available in these categories of women. Also, the role of antenatal care is again stressed as it helps for prevention, early detection and prompt management.

Also found in this study was the poorer maternal outcome associated with higher blood pressure, increasing number of convulsions and the interval between 1st convulsion to delivery. It is therefore pertinent that women are encouraging to present early and that partners are involved in maternal healthcare in order to facilitate prompt presentation at the health facility.

The observation in this study that most cases were referred from nursing homes, spiritual and other private health facilities where the quality of care is not optimal raises the need for regulatory authorities to partner with private health practitioners in improving the quality of antenatal care. It is equally important to strengthen the referral system in all these health care facilities to expedite prompt referral especially in cases with life-threatening conditions like eclampsia.

ACKNOWLEDGMENTS

Author would like to thank O. T. Okoror for the support during study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

- Khan KS, Wojdyla D, Say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: A systematic review. *Lancet* (London, England). 2006;367(9516):1066-74.
- Seal SL, Ghosh D, Kamilya G, Mukherji J, Hazra A, Garain P. Does route of delivery affect maternal and perinatal outcome in women with eclampsia? A randomized controlled pilot study. *Am J Obstet Gynecol.* 2012; 206(6):484.e1-7.
- Backes CH, Markham K, Moorehead P, Cordero L, Nankervis CA, Giannone PJ. Maternal preeclampsia and neonatal outcomes. *J Pregnancy.* 2011; 2011:214365.
- Miller DA. Hypertension in pregnancy. In: Decherney AH, Nathan L, Laufer N, Roman AS, editors. *Current Diagnosis and treatment: Obstetrics and Gynaecology.* 11th ed. USA: The McGraw-Hill; 2013. p. 454-64.
- Douglas KA, Redman CWG. Eclampsia in the United Kingdom. *BMJ.* 1994 Nov; 309(6966):1395-400.
- Mattar F, Sibai BM. Eclampsia: Risk Factors for maternal morbidity. *Am J Obstet Gynecol.* 2000; 182(2):307-12.
- Obed SA, Wilson JB, Elkins TE. Eclampsia: 134 consecutive cases. *Int J Gynecol Obstet.* 1994; 45(2):97-103.
- Adinma ED. Maternal and perinatal outcome of eclampsia in tertiary health institution in Southeast Nigeria. *J Matern Neonatal Med.* 2013;26(2):211-4.
- Jido TA. Eclampsia: Maternal and foetal outcome. *Afr Health Sci.* 2012;12(2):148-52.
- Onuh SO, Aisien AO. Maternal and foetal outcome in eclamptic patients in Benin City, Nigeria. *J Obst Gynaecol (Lahore).* 2004;24(7):765-8
- The Eclampsia Trial Collaborative Group. Which anticonvulsant for women with eclampsia? Evidence from the Collaborative Eclampsia Trial. *Lancet* (London, England). 1995;345(8963):1455-63.
- Duley L, Gulmezoglu AM, Henderson-Smart DJ, Chou D. Magnesium sulphate and other anticonvulsants for women with pre-eclampsia. *Cochrane Database Syst Rev* 2010; CD000025.
- Igberase GO, Ebeigbe PN. Eclampsia: Ten years of experience in a rural tertiary hospital in Niger Delta, Nigeria. *J Obstet Gynaecol.* 2006 Jan; 26(5):414-7.
- Kullima AA, Kawuwa MB, Audu BM, Usman H, Geidam AD. A 5-year review of maternal mortality associated with eclampsia in a tertiary institution in northern Nigeria. *Ann Afr Med.* 2009;8(2):81-4.
- Lee W, O'Connell CM, Baskett TF. 2004. Maternal and perinatal outcomes of eclampsia: Nova Scotia, 1981-2000. *J Obst Gynaecol Canada.* 2004; 26(2):119-23.
- Praxton A, Maine D, Hijab N. Using the UN process indicators of emergency obstetric services: questions and answers. *Workbook, Averting Maternal Death & Disability (AMDD) Program.* 2003
- Alam IP, Akhter S. Perinatal outcome of eclampsia in Dhaka Medical College Hospital, Dhaka. *Bangladesh J Obstet Gynaecol.* 2009;23(1):20-4.
- Edson W, Burkhalter B, McCaw-Binns A. Timeliness of care for eclampsia and pre-eclampsia in Benin, Ecuador, and Jamaica. *Int J Gynecol Obst.* 2007;97(3):209-14.
- Agida ET, Adeka BI, Jibril KA. Pregnancy outcome in eclamptics at the University of Abuja Teaching Hospital, Gwagwalada, Abuja: A 3 year review. *Niger J Clin Pract.* 2010;13(4):394-8.

20. Olatunji O, Sule-Odu AO. Presentation and outcome of eclampsia at a Nigerian University Hospital. *Niger J Clin Pract.* 2007;10(1):1-4.
21. Onah HE, Okaro JM. Caesarean Section in delivery of Nigerian eclamptics. *Trop J Obst Gynaecol.* 2001 Jan; 18(1):34-7.
22. George IO, Jeremiah I. Perinatal outcome of babies delivered to eclamptic mothers: A prospective study from a Nigerian Tertiary Hospital. *Int J Biomed Sci.* 2009;5(4):390-4.
23. Onwuhafua PI, Oguntayo A. Perinatal mortality associated with eclampsia in Kaduna, Northern Nigeria. *Niger J Med.* 2006;15(4):397-400.
24. Kamilya G, Bharracharyya SK, Mukherji J. Changing trends in the management of eclampsia from a teaching hospital. *J Indian Med Assoc.* 2005 2005;103(3):132-4.

Cite this article as: Okoror CEM. Maternal and perinatal outcome in women with eclampsia: a retrospective study at the University of Benin Teaching Hospital. *Int J Reprod Contracept Obstet Gynecol* 2019;8:108-14.