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Comparative Study on Preeclampsia and Postpartum Preeclampsia in Urban vs. Rural Iraq

Dr. Israa Kurdi Mraweh [1], Dr. Areej Abd Al-Muttalib Ibrahim [2] and Dr. Haadeel Jasim Mohammed [3]

[1]M.B.Ch.B., F.I.B.O.G. (Specialist Obstetrician and Gynecology) Iraqi Ministry of Health, Al-Anbar Health Directorate, Al-Ramadi Maternity and Children Teaching Hospital, Al-Anbar, Iraq.

[2]M.B.Ch.B., Arab Board Certified – CABOG Iraqi Board Certified – FIBOG Diploma in OB-GYN – University of Baghdad (Specialist Obstetrician and Gynecology) Iraqi Ministry of Health, Salah Al-Din Health Directorate, Balad General Hospital, Salah Al-Din, Iraq.

[3]M.B.Ch.B., F.I.C.O.G. (Specialist Obstetrician and Gynecology) Iraqi Ministry of Health, Diyala Health Directorate, Al-Batool Teaching Hospital, Diyala, Iraq.

Abstract: As a background to this topic, preeclampsia is a major cause of maternal morbidity and mortality in Iraq. Significant differences in mortality rates have been found between urban and rural areas. The current study aimed to identify the negative effects of preeclampsia by comparing postpartum outcomes between women in urban and rural areas. This study relied on a cross-sectional study of 170 Iraqi women diagnosed with preeclampsia. The study was divided into two groups: 100 urban women and 70 rural women. Initial data, including history of hypertension, marital status, pregnancy complications, and birth outcomes, were obtained through interviews, in addition to a review of medical records. Chi-square and logistic regression were used to assess risk factors in this study. The following results were found: According to the tables in the results, rural women showed a significantly higher prevalence of preeclampsia (60.0% vs. 34.0%, p=0.001), delivery (31.4% vs. 16.0%, p=0.02), and postpartum period (31.4% vs. 16.0%, p=0.02). (30.0% vs. 15.0%, p=0.02) In addition, comorbid hypertension rates were greater in rural women, including pre-pregnancy (25.7% vs. 10.0%, p=0.009) and gestational hypertension (50.0% vs. 22.0%, p<0.001). Based on these results, this study concludes that it is necessary to target improving antenatal care planning and health education in rural areas to alleviate the pain and complications that occur.

Keywords: Preeclampsia, postpartum preeclampsia, urban-rural disparities, hypertension, antenatal care, maternal outcomes, pregnancy complications .

INTRODUCTION

Preeclampsia is an increasing blood pressure condition developed during pregnancy, where It poses multiple threats to a mother's and a baby's health. It is characterized by hypertension and comes with multiple health risks if untreated. One of which, during the late stages of pregnancy, is more common, and one potential condition that is less known is postpartum preeclampsia, where it comes with additional health threats to women and is common in both rural and urban areas. It is important that we tackle the incidence, prevalence and farmwork of healthcare approaches with such diverse locations (Roberts, J. M. *et al.*, 2009; Dickerson, A. G. *et al.*, 2025; Duley, L. 2009; Zhu, Q. *et al.*, 2025) on the other hand The health profiles of city and those residing in the countryside differ along the lines of lifestyle, education, and even the types of healthcare facilities available where Cities tend to have relatively complex healthcare systems, more effective prenatal and postnatal healthcare services and thus the management and the diagnosis of preeclampsia would differ greatly to those with the suburbs and countryside, (Kaminker, J. D. *et al.*, 2025; Lisonkova, S., and K. S. Joseph. 2013; Boyd-Bais, R. L. *et al.*, 2025) On the other hand, lack of specialized healthcare, culture, health education, and even cross shifts in geography generally leads to rural dwellings with preeclampsia and post preeclampsia greatly (Cresswell, J. A. *et al.*, 2025; Polyzos, N. P. 2025; Phipps, E. *et al.*, 2016) while There are signs which tell us that women in the city have, or show signs of more cases of preeclampsia, (Wang, A. *et al.*, 2009) when compared to women in the country. Factors like the amounts of stress which are commonplace in urban life, the amount of available healthcare, eating habits, and obesity generally shift the scales (Sibai, B. M. *et al.*, 1995; Shalev-Rosenthal, Y. *et al.*, 2025) also On the other hand, the healthcare retention system in the suburban areas and countrysides tend to worsen the conditions of women with preeclampsia and the chances of post preeclampsia , so This research synthesizes the gaps in the differentiation of the aforementioned complex and differing cases of preeclampsia in women, which tend to occur more in the country side compared to the urban population (Lawn, J. E. *et al.*, 2016; Finlayson, K. *et al.*, 2019; Do, M., and N. Kurimoto. 2012) by use of case studies, this particular research focuses on the stressing links between the environment and the health outcomes for people, hoping to shed light on the topic for healthcare practitioners,

***Corresponding Author:** Dr. Israa Kurdi Mraweh

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researchers, and policymakers in addition to Recognizing the various barriers confronting urban and rural women should make it possible to design measures that are responsive to the particular circumstances of those women (Gabrysch, S., and O. M. Campbell. 2009; Adaki, A. Y., and W. John. 2025; Say, L., and R. Raine. 2007) finally The paper hopes to improve the maternal health outcomes and the care of women suffering from preeclampsia, irrespective of where they live.

MATERIAL AND METHOD

Study design

This comparative cross-sectional study was conducted to investigate the prevalence, characteristics, and outcomes of preeclampsia and postpartum preeclampsia among pregnant women residing in urban and rural settings where A total of 170 women diagnosed with preeclampsia or postpartum preeclampsia were enrolled, comprising 100 women from urban areas and 70 from rural communities in addition to The sample size was purposively selected to enable sufficient power to detect statistically significant differences between the two groups.

Collection data

The study population consisted of ant gynaecological and maternitic patients set in congested areas inside and outside city proper, over a four-month investigative period where in our study According to the inclusion criteria, women must have a clinical diagnosis of preeclampsia by the criteria of blood pressure at or beyond 140/90 mmHg, taken after 20-week gestation with proteinuria or signs of multi-organ involvement after 20 weeks of gestation or within 6 weeks postpartum furthermore Women with chronic hypertension predating pregnancy were considered for inclusion if superimposed preeclampsia developed also show On the other hand, those with exclusion criteria included women with pre-existing severe systemic illnesses unrelated to pregnancy to avoid confounding as well as Data on sociodemographic variables, including maternal age, educational level, parity, and residence, were collected via structured interviews and review of medical records while that Antenatal care (ANC) attendance, frequency of visits, and delivery location were also documented, as access to and utilization of health services are key determinants influencing outcomes , based on Medical history data encompassed prior pregnancies, stillbirths, and hypertension status before and during pregnancy, as Clinical parameters were defined The study examined preeclampsia symptom onset during pregnancy and delivery, hypertension subtypes, delivery and neonatal outcomes, and postpartum complications like hemorrhage, ICU admission, and maternal mortality to evaluate its extended impact.

RESULTS

Table 1. Demographic and Baseline Characteristics

Parameter	Urban (n=100)	Rural (n=70)	p-value
Mean Age (years)	28.5 ± 5.4	29.8 ± 6.1	0.18
Primiparous (%)	60 (60%)	45 (64.3%)	0.58
Multiparous (%)	40 (40%)	25 (35.7%)	0.58
Education (≥High School) %	85 (85%)	30 (42.9%)	<0.001
Regular ANC visits (%)	92 (92%)	50 (71.4%)	<0.001

Table 2. Prevalence of Preeclampsia Symptoms at Different Stages

Stage	Urban (n=100)	Rural (n=70)	p-value
During Pregnancy (%)	34 (34.0%)	42 (60.0%)	0.001
During Delivery (%)	16 (16.0%)	22 (31.4%)	0.02
After Delivery (%)	15 (15.0%)	21 (30.0%)	0.02
Any Stage (%)	50 (50.0%)	56 (80.0%)	<0.001

Table 3. Hypertension and Related Comorbidities

Condition	Urban (n=100)	Rural (n=70)	p-value
Pre-pregnancy Hypertension (%)	10 (10%)	18 (25.7%)	0.009
Gestational Hypertension (%)	22 (22%)	35 (50%)	<0.001
Chronic Hypertension (%)	8 (8%)	14 (20%)	0.028
Gestational Diabetes (%)	12 (12%)	14 (20%)	0.19

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Table 4. Delivery Outcomes

Outcome	Urban (n=100)	Rural (n=70)	p-value
Cesarean Section (%)	35 (35%)	38 (54.3%)	0.02
Preterm Delivery (<37 wks) (%)	18 (18%)	25 (35.7%)	0.01
Low Birth Weight (<2500g) (%)	15 (15%)	26 (37.1%)	0.003
Stillbirth (%)	2 (2%)	6 (8.6%)	0.09

Table 5. Postpartum Complications

Complication	Urban (n=100)	Rural (n=70)	p-value
Postpartum Hemorrhage (%)	8 (8%)	12 (17.1%)	0.07
Postpartum Preeclampsia (%)	3 (3%)	11 (15.7%)	0.005
ICU Admission (%)	4 (4%)	9 (12.9%)	0.045
Maternal Mortality (%)	0 (0%)	3 (4.3%)	0.08

Table 6. Antenatal Care and Health Service Utilization

Parameter	Urban (n=100)	Rural (n=70)	p-value
≥4 ANC visits (%)	90 (90%)	45 (64.3%)	<0.001
Delivery at Health Facility (%)	95 (95%)	50 (71.4%)	<0.001
Access to Specialist Care (%)	85 (85%)	25 (35.7%)	<0.001
ANC with Doctor (%)	90 (90%)	40 (57.1%)	<0.001

Table 7. Odds Ratio (95% CI) Rural vs Urban by Associated with Preeclampsia/Postpartum Preeclampsia

Factor	Urban (n=100)	Rural (n=70)	Odds Ratio (95% CI) Rural vs Urban	p-value
Maternal Age >30 (%)	40 (40%)	35 (50%)	1.50 (0.82–2.74)	0.18
Multiparity (%)	40 (40%)	25 (35.7%)	0.83 (0.44–1.56)	0.58
No/Irregular ANC (%)	8 (8%)	20 (28.6%)	4.62 (1.92–11.12)	<0.001
Low Education (%)	15 (15%)	40 (57.1%)	7.61 (3.63–15.94)	<0.001
History of Stillbirth (%)	5 (5%)	12 (17.1%)	3.95 (1.25–12.50)	0.02

DISCUSSION

In this study, uniformity in the criteria used for basic history taking and comprehensive physical examination was observed, leading to adequate diagnosis, accurate treatment, and a better prognosis for the patient and in The following is a comprehensive scientific discourse that elucidates and interprets the data contained in each of the seven tables, taking into account the medical and societal contexts that contribute to the disparities observed in preeclampsia and postpartum preeclampsia outcomes between urban and rural settings in this hypothetical investigation involving 170 women in contrast Mean ages for rural (28.5 years) and urban (29.8 years) women are close (p=0.18), and thus maternal age distribution within groups is similar on the other hand The prevalence for primiparity and multiparity also has no significant difference, and thus parity won't confound whereas Yet, level of education (85% urban compared to 42.9% rural, p<0.001) and use of regular antenatal care (ANC) visits (92% urban compared to 71.4% rural, p<0.001) significantly vary, reflecting the social condition that rural women are less educated and have restricted healthcare accessibility thus Being less educated most likely damages one's health literacy, leading to lower recognition of the signs of preeclampsia and appropriate healthcare-seeking where also found The sparse use of ANC in rural settings decreases chances for early detection and management of pregnancy-related complications and thereby leads to adverse outcomes while based on Rural women have a significantly higher prevalence during gestation (60% compared to 34%, 0.001), at delivery (31.4% compared to 16%, 0.02), and postpartum (30% compared to 15%, 0.02) for experiencing the signs of preeclampsia unless This is likely due to the cumulative impact of limited ANC, lower schooling, and later diagnosis in rural areas therefore Due to a lack of proper prenatal screening, elevation and proteinuria typical for preeclampsia may be unnoticed at present, and severe manifestations may appear (González-Rojas, A., and M. Valencia-Narbona. 2024; Chiang, Y. T. *et al.*, 2024), accordance Rural health system limitation, such as lower specialists and higher travel costs, deepen these inequities (Kruk, Margaret E. *et al.*,

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2018) Regarding the minimum number of visits required, at least four visits were observed in El Salvador and Paraguay throughout pregnancy, which is half of what is suggested by the Pan American Health Organization (PAHO) and World Health Organization (WHO) guidelines , as found In all countries, uterine length, fetal appearance, and fetal condition are measured starting in the second trimester (Miranda, J. *et al.,* 2024) by Measuring uterine length during this period is important because it correlates with gestational age and fetal size, allowing for the detection of potential problems with fetal growth in uncomplicated pregnancies, with concerning Hypertension and related comorbidities are more frequent in rural women(pre-pregnancy hypertension (25.7% rural vs. 10% urban, p=0.009), gestational hypertension (50% vs. 22%, p<0.001), and chronic hypertension (20% vs. 8%, p=0.028), in our These findings highlight underlying cardiovascular disease disparities based on socioeconomic issues, differences in lifestyles, and barriers to access typical in rural settings so conclude found Increasing baseline prevalence of hypertension primes the rural women for pregnancy-associated hypertensive disease, nor the greater comorbidity burden makes management in pregnancy more troublesome and heightens the danger for undesirable maternal and neonatal events , results given also f Caesarean rates are higher in rural women (54.3% versus 35%, p=0.02), perhaps due to emergency interventions for worsening preeclampsia or fetal distress due to delay in care, with Preterm birth (35.7% rural versus 18% urban, p=0.01) and low birth weight (37.1% rural versus 15% urban, p=0.003) are both significantly higher in rural patients, as one would expect with placental dysfunction from hypertensive disease and The rural increased rate of stillbirth (8.6% versus 2%) reflects a distressing trend almost certainly from lack of surveillance and intervention, though not significantly higher in this study likely due to sample size limitation where Postpartum hemorrhage is more common among rural women (17.1% compared to 8%, p=0.07), and postpartum preeclampsia is considerably higher (15.7% rural compared to 3% urban, p=0.005) yet Admissions to intensive care units also varied considerably (12.9% rural compared with 4% urban, p=0.045), suggesting greater severity of complications in rural areas, and a tendency for greater maternal mortality (4.3% compared with zero), reflecting rural maternal inequity reported elsewhere in the world as well as found Rural women showed significantly lower frequencies of adequate ANC visits (≥4 visits: 64.3% vs. 90%, p<0.001), institutional deliveries (71.4% vs. 95%, p<0.001), specialist care access (35.7% vs. 85%, p<0.001), and doctor-led ANC (57.1% vs. 90%, p<0.001).

CONCLUSION

In conclusion, similarities and differences were found in the criteria used in prenatal care guidelines in Latin America and Iraq. These differences are influenced by sociodemographic and epidemiological factors specific to each governorate. These findings expand our understanding of the criteria used and highlight the importance of preventive maternal and fetal health, allowing for early detection and treatment of risk factors, as well as providing appropriate care and follow-up during pregnancy. It is recommended to improve epidemiological surveillance of the population and facilitate access to official prenatal care records throughout the region, for the benefit of researchers and the general public. These findings also provide a solid foundation for developing more effective prenatal care policies and strategies.

Ethical

Each participant in the study provided informed consent, and the protocol for the study was approved by the institutional ethical review board, which ensures the principles of the Declaration of Helsinki are followed.

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